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Social construction of risk:  
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longitudinal analysis of  
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By Brian Caplan



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# Social construction of risk: a postcolonial retrospective longitudinal analysis of Haiti's 2010 earthquake

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## Abstract

The Republic of Haiti (Haiti) is the poorest and least developed country in the Western Hemisphere. Plagued by floods, landslides, earthquakes, droughts and more, it is subject to repeated natural hazard events, often leading to large-scale disasters. As such, it has long been a topic of study for Disaster Risk Reduction research, with numerous attempts made to understand and address the conditions that translate hazard events into disasters. Despite this concerted effort, it remains in a state of vulnerability, evidenced by the 2010 Earthquake — the most devastating natural hazard-induced disaster in modern history. This disconnect is, in large part, borne out of a failure to recognise the underlying conditions that create vulnerability in the first place — conditions initiated during colonisation. The Forensic Investigation of Disasters methodological framework, and specifically its Retrospective Longitudinal Analysis approach, offers scope to interpret Haiti's development trajectory through a historical perspective, allowing for a deeper exploration of the nation's "root-causes" of vulnerability. By adapting the Retrospective Longitudinal Analysis approach to include a postcolonial perspective, we can ultimately trace the country's current conditions to practices initiated during its time as the French Colony of Saint-Domingue. In doing so, we uncover that the deforestation, soil erosion, economic instability, weak governance structures, and unregulated urbanisation we see today are a result of the colonial structures imposed over 300 years ago. Studies such as this, not only aim to contribute empirically to risk construction within Haiti but demonstrate the value of incorporating a postcolonial perspective into Disaster Risk Reduction studies.

# Content

**01**

05 Introduction

**02**

08 Literature  
review

**03**

14 Analytical  
approach

**04**

19 Case study  
analysis

**05**

26 Discussion

**06**

28 Conclusion

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**“Natural Disasters”, once thought to be inevitable, are now better understood within the field of disaster studies as the interaction between natural hazards and vulnerable populations.**

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# 01. Introduction

The Republic of Haiti (Haiti), once the richest colony in the West Indies, is the poorest and least developed country in the Western Hemisphere, ranking 169 out of 189 countries on the United Nations Human Development Index (United Nations Development Programme, 2019). Located on the western-third of the island of Hispaniola in the Caribbean Archipelago, it is highly exposed to a variety of natural hazards such as earthquakes, hurricanes, floods, landslides, and droughts (Alscher, 2011). Haiti’s underdevelopment coupled with frequent natural hazards often leads to large-scale disasters, as seen during the 2010 Haiti Earthquake—the most devastating disaster event in the country’s recent history (World Vision, 2019).

Formerly a colony of the French Empire, Haiti, then Saint-Domingue, gained its independence in 1804 following the Haitian Revolution, which involved the majority slave population revolting against the minority colonial elites establishing the second country to free itself of colonial rule (after the United States) and first “black republic” in the Americas (Oliver-Smith, 2010, p. 33; Macleod et. al., 2020). Yet, despite its more than 200 years of sovereignty, it is plagued by weak governance structures, environmental degradation, and economic instability—processes initiated during French colonisation and subsequently exacerbated by neocolonial international trade policies. It is the consequences of these colonial processes that this paper will argue are the root-causes of Haiti’s vulnerability to natural hazards. This high degree of vulnerability is ultimately what translates natural hazard events into disasters, evidenced by the 2010 Earthquake.

“Natural Disasters”, once thought to be inevitable, are now better understood within the field of Disaster Studies as the interaction between natural hazards and vulnerable populations. Further, populations are made vulnerable by historical and social processes that construct risk, a theory known as the Social Construction of Risk. This perspective maintains that disaster events are “deeply rooted in the social, economic and environmental history of the society where they occur” and further, are “processes that unfold through time” (Oliver-Smith et al., 2016, p. 32). Additionally, Carrigan (2015) advocates for the integration of postcolonial perspectives into Disaster Studies to get a deeper understanding of the root-causes of vulnerability. To this point, Oliver-Smith’s (1994) paper titled: *Peru’s Five-Hundred-Year Earthquake: Vulnerability in Historical Context*, suggests that Peru’s devastating 1970 earthquake was a consequence, among others, of the “subversion of indigenous adaptations” to natural hazards initiated at the time of Spanish colonial conquest (p. 80).

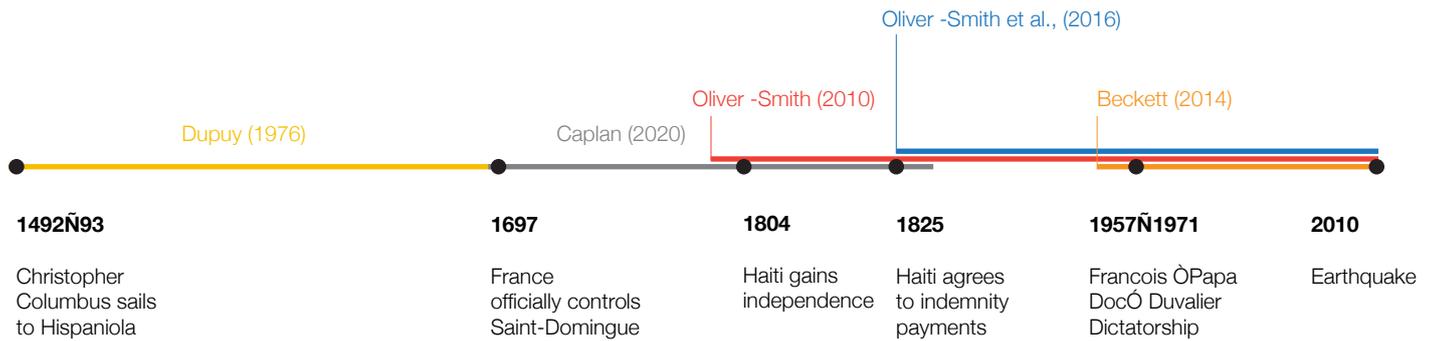
A number of internationally recognised frameworks have been developed to promote, implement and inform Disaster Risk Reduction (DRR) research as well as strategies including the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR). In order to operationalise the SFDRR, the FORensic INvestigation of Disasters II (FORIN II) methodology was developed, which provides tailored research approaches predicated upon the principles of the Social Construction of Risk. It does so by investigating the strong drivers of risk including Poverty and Income Distribution, Environmental Degradation and Ecosystem Services Depletion, Urban and Rural Land Use Patterns, and Population Growth and Distribution. One such approach, Retrospective Longitudinal Analysis (RLA), is specifically concerned with the “temporal development of processes that have produced disasters in the past” (Oliver-Smith et al., 2016, p. 33), allowing for a historical analysis of risk construction that lead to current disasters. While there have been numerous attempts to analyse the origin of Haiti’s underdevelopment through a postcolonial perspective (see Dupuy, 1976; Oliver-Smith, 2010), few have explicitly incorporated it into disaster studies. Equally, attempts to analyse risk construction in Haiti often fail to incorporate a postcolonial perspective risking reproducing the processes that constructed the original vulnerabilities.

In a similar fashion to Oliver-Smith’s (1994), this paper aims to demonstrate that Haiti’s current vulnerability to natural hazards, evidenced by frequent landslide, flooding, and earthquake triggered disasters, is a product of historical processes, much of which, to some degree, were initiated during its colonial and neocolonial past. It will do so by investigating strong drivers of risk outlined in the FORIN II methodology RLA approach primarily during its period as the French colony of Saint-Domingue, roughly 1697-1804. Although Oliver-Smith et al., (2016) Forensic Investigations of Disasters (FORIN): A Conceptual Framework and Guide to Research already demonstrated RLA’s application through a case study of the 2010 Earthquake in Haiti—acknowledging the influence of neocolonial trade policies, US occupancy, and the dictatorship of Francois “Papa Doc” Duvalier—it leaves room for further investigation during its French colonial period, to which this paper endeavours to provide. Figure 1.1, Timeline of Previous Research on Disaster Studies in Haiti, provides a timeline outlining previous topics of study in relation to this paper’s principal focus including: Dupuy (1976), which provides a historical analysis of Haiti’s underdevelopment during its transition from Pre-Columbian Haiti to a Spanish colony (1492-1697); Oliver-Smith (2010), which likens Haiti’s 2010 Earthquake to Peru’s 1970 “Five Hundred Year Earthquake” by discussing the historical construction of risk within the nation primarily, although not exclusively, in the roughly 200 years after independence (1804-2010); Oliver-Smith (2016), which demonstrates the application of RLA through a case study of Haiti’s 2010 Earthquake by investigating strong drivers of risk exacerbated through exorbitant indemnity payments to France, US AID intervention, and the dictatorship of Francois “Papa Doc” Duvalier (1825-2010); and Beckett (2014), which describes Haiti’s expression of statelessness and weak governance structures that allowed for highly vulnerable people to settle in exposed areas under the Duvalier dictatorship (1957-2010).

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**While there have been numerous attempts to analyse the origin of Haiti’s underdevelopment through a postcolonial perspective (see Dupuy, 1976; Oliver-Smith, 2010), few have explicitly incorporated it into disaster studies.**

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**FIGURE 1.1**  
Timeline of Previous Research on Disaster Studies in Haiti

This paper will now proceed from Chapter 2 through to Chapter 6. Chapter 2, Literature Review, will provide a contextual overview of the relevant literature related to the field of Disaster Studies. This will include a brief historical overview of its theoretical development, a review of essential vocabulary, and an introduction to prominent theories such as the Social Construction of Risk and Postcolonialism. Chapter 3, Analytical Approach, will introduce and explain the FORIN II methodology as well as provide its contextual background. This section will discuss strong drivers of risk, which allow us to uncover the root causes of vulnerability. Chapter 4, Case Study Analysis, will build on previous studies within Haiti by providing a postcolonial narrative to risk construction initiated during its period as the French colony of Saint-Domingue. This will include a description of Haiti's current vulnerability to risk and the effects of the 2010 Earthquake; however, its primary focus will centre around uncovering strong drivers of risk that emerged through practices implemented in Saint-Domingue from roughly the 1690s-1830s. Chapter 5, Discussion, will discuss the influence of colonisation on more proximate strong drivers of risk in more recent periods in Haiti's history. Chapter 6, Conclusion, will briefly reiterate this paper's objective, broaden the scope of postcolonial disaster risk reduction frameworks' application, as well as provide an initial recommendation towards achieving disaster risk reduction within Haiti. This section (and paper) aims to position Haiti at the forefront of a larger postcolonial DRR research agenda, offering opportunities to expand investigative avenues and demonstrate the value of incorporating postcolonial perspectives into interpretations of contemporary vulnerability to natural hazards among all postcolonial states.

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**“To understand disasters we must not only know about the types of hazards that might affect people, but also different levels of vulnerability of different groups of people. The vulnerability is determined by social systems and power, not by natural forces.”**

Wisner et al., 2004, p. 7

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## 02. Literature review

### Disaster studies discourse

Contemporary disaster studies is principally concerned with “managing crisis situations, seeking to reduce vulnerability and assist post-disaster recovery” (Carrigan, 2015, p. 117). Emerging in the 1950s, it is an interdisciplinary field that has gained greater importance in recent years due to the increased manifestations of anthropogenic climate change impacts and capitalist exploitation of resources, which increase the frequency and magnitude of what is commonly referred to as “natural disasters” (IPCC, 2007; Carrigan, 2015). This typically includes natural hazard events such as earthquakes, hurricanes, flooding, droughts, and landslides, among many others. Yet, “Natural Disaster” is considered a misnomer in the field of Disaster Studies, as it is now more widely accepted among development practitioners that disasters only happen because “trigger events (natural hazards) [interact] with vulnerable populations” and, further, “hazards are only ‘translated’ into a disaster if there are vulnerable people to be affected by it” (Cannon et al., 2014, p. 185; Sun and Faas, 2018, p. 624). Although this was not always, and often still is not the case.

From the 1940s-1960s, the field was originally preoccupied with the notion of disasters as “events outside society” or as objective events (Sun and Faas, 2018, p. 624). It applied what Sun and Faas (2018) refer to as a “naïve realist perspective”, in which our perception of reality is premised upon “nature and objects in the world that they are, independent of history and our conceptual schemes” (p. 623). In this sense, disasters are a product of natural events bearing little relevance to the socio-political, socio-economic and socio-environmental histories and conditions that influence individuals’ or communities’ concept of or exposure to risk and ability to cope with experienced hazards.

This objective, realist perspective still holds influence within the field today; however, beginning the 1970s, critics increasingly incorporated theories aligned more closely with political ecology, based heavily on understandings of “social conflict, social inequality and political economy” (Burton et al., 1968; Tierney, 1989; Sun and Faas, 2018, p. 624). This would progress into a constructionist perspective that aimed to understand the mechanisms by which disasters happen through an exploration of social structures and processes (Sun and Faas, 2018). In the seminal work, *At Risk: Natural Hazards, People’s Vulnerability, and Disasters*, originally by Piers Blaikie et al. (1994) and subsequently revised by Wisner et al. (2004), they argue that:

“to understand disasters we must not only know about the types of hazards that might affect people, but also different levels of vulnerability of different groups of people. The vulnerability is determined by social systems and power, not by natural forces.”

Wisner et al., 2004, p. 7

This perspective emphasizes that “disasters come from society and have root causes in social processes” (Sun and Faas, 2018, p. 624), which ultimately gave rise to the theory Social Construction of Disasters. However, before we further explore any theories, we must first discuss some vocabulary in order to better understand Disaster Risk.

## **Determinants of risk in disaster studies**

### **Exposure**

Exposure is one of two critical components typically considered when discussing drivers of risk. According to Cardona et al. (2012), “Exposure refers to the inventory of elements in an area in which event may occur” which indicates that exposure is a function of who and what exists within a physical location (UNISDR, 2004; UNISDR, 2009; Cardona et al. 2012, p. 69). The inventory of elements includes a broad range of components within a system including, but not limited to, economic resources, infrastructure, and populations (Cardona et al., 2012). These components, if located within a hazard area, are subject to process disruption or destruction, threatening the communities themselves and the systems on which they depend.

### **Vulnerability**

According to Wisner (2016) “the history of the term vulnerability is long and complex” in large part due to the various “disciplines, subdisciplines, [and] professions” that differentially employ measurements and metrics depending on their study’s research objective, operation scale, or population focus among a multitude of other complex factors (p. 1).

Despite the many uses and interpretations of vulnerability, this paper will rely most heavily on the working definition proposed by Wisner et al., (2004):

“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 (an extreme natural event or process).” p.11

These characteristics are determined by a combination of factors that influence “the degree to which someone’s life, livelihood, property and other assets” are threatened or put “at risk” by an event or series of events (Wisner et al., 2004, p. 11; Cardona et al., 2012). They include but are not limited to, qualities such as age, differing abilities (disabilities), and health status, which may render people predisposed to experience the adverse impacts of hazards to a greater degree; or class, gender, ethnicity, education, economic status, and immigration status (Wisner et al., 2004; Cardona et. al., 2012;

Oliver-Smith et al., 2016), which themselves do not make people more vulnerable, but due to social, political, and economic processes that shape people's access to resources and rights, people are rendered as such. In fact, it is the recognition of these underlying social, political, economic and environmental forces that shape people's exposure and vulnerability to hazards that gave rise to the aforementioned Social Construction of Disasters theory.

## **Social construction of disasters theory**

The Social Construction of Disasters, in juxtaposition to the realist perspective, rejects the naturalness of "natural disasters", instead maintaining that "social vulnerability to some extent determines whether hazards result in disasters" (Wisner et al., 2004; Sun and Faas, 2018, p. 625). It suggests that the relationship between the determinants of risk, exposure and vulnerability, which are shaped by "historical and prevailing cultural, social, environmental, political, and economic contexts", are what create the conditions that translate natural hazard events into disasters (Cardona et al., 2012, p. 71). This relationship is well articulated by Figure 2.1, The Social Causation of Disasters, which highlights the scope, spatial distribution and scale of variables that underpin and reinforce the translation of hazards into a disaster.

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**Natural hazards such as flooding, earthquakes, or hurricanes, among others, only become disasters when they interact with exposed and vulnerable populations rendered as such by political, economic, environmental and cultural forces.**

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Figure 2.1 represents that the scale of influences can originate from international and national political and economic processes, that shape "social systems and power relations" which govern the realities experienced by different people or groups based on their characteristics. These manifest as unequal opportunities and exposure to hazards which then differentially interact with populations based on their vulnerability, determining by whom and to what degree a disaster is experienced. In this sense, natural hazards such as flooding, earthquakes, or hurricanes, among others, only become disasters when they interact with exposed and vulnerable populations rendered as such by political, economic, environmental and cultural forces (Wisner et al., 2004; Cardona et al., 2012; Cannon et al., 2014) that shape individuals' and communities' ability to prepare for, cope with and recover from triggering hazard events (Blaikie et al., 1994; Wisner et al., 2004; Wisner, 2016; Oliver-Smith et al., 2016).

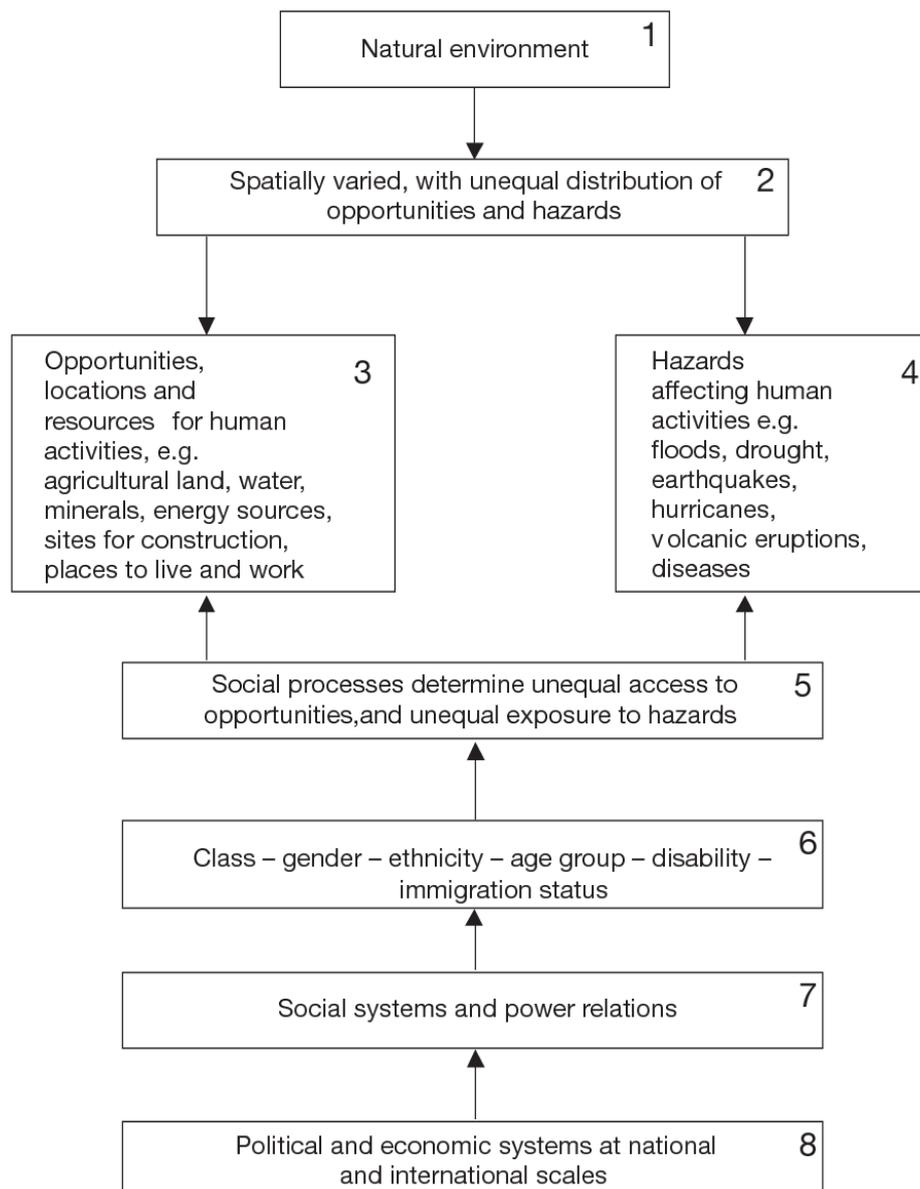
What is critical to note is that exposure alone does not result in disaster, but rather exposed communities with elements of high vulnerability can result in disaster. Considering that underdevelopment is a strong indicator for high levels of vulnerability, disasters are not simply a factor of exposure to hazards, but rather it is the ability to prepare for, cope with and recover from hazards that determines the expression of impacts on social elements and systems.

This is exemplified by the disproportionately high casualties resulting from exposed populations in least developed countries (LDCs) when compared to developed countries (DCs). International statistics suggest that while LDCs account for only 11% of exposed global populations, 53% of casualties come from these nations (Dao and Peduzzi, 2002; Peduzzi et al., 2009). When this is compared with DCs, which account for a greater percentage of exposed communities – up to 15% – it only consists of 1.8% of casualties from contact with hazards (Peduzzi et al., 2009). This highlights that vulnerability is ultimately what determines which abilities are available and can be utilized to prevent the translation of hazards into disasters. Further, it is social and historical processes that render the characteristics of certain populations or systems vulnerable in the first place.

**FIGURE 2.1**

Cannon's The Social Causation of Disasters.

Source: Wisner, 2004, p. 8



## Postcolonial disaster studies

Postcolonial Theory asserts that “the world we inhabit is impossible to understand except in relationship to the history of imperialism and colonial rule” (Elam, 2019, p. 1). Borne out of anticolonial perspectives within Postcolonial studies in the 1980s, it aims to “[account] for the political, aesthetic, economic, historical, and social impact” of colonialism while identifying by whom and how its effects are still experienced (Ibid). It is this perspective that Carrigan (2015) argues should be integrated into disaster studies to each fields’ mutual benefit. He argues that engaging with postcolonial theories within disaster studies will aid in disaster response because it makes more obvious the social causes of disasters (Carrigan, 2015). This perspective will help to identify the processes by which colonial and neocolonial practices influence historical patterns of development that socially construct contemporary vulnerabilities to hazards. That can then be used to better inform mitigation, response and recovery processes, which too often reproduce structures that maintain or worsen existing vulnerabilities.

Frequently the term colonisation is used to refer to a generalised practice in which typically a dominant Western European political power “[settles] among and [establishes] control over the indigenous people of an area” (Oxford Languages, 2020); or more simply, it is the “[act] of appropriating a place or domain for one’s own use” (Ibid). Yet, it is critical to note that colonial rule is not homogenous. In fact, Bruhn and Gallego (2010) argue that the economic activities colonisers engaged in can differ dramatically and, in turn, have profoundly different impacts on the development trajectories of postcolonial states. They further argue that specific economic activities can be categorized as “good” or “bad” based on high or low levels of reliance on the exploitation of labour which result in high or low development pathways, respectively (Bruhn and Gallego, 2010, p. 1). For example, activities such as sugar cultivation and mining are considered bad activities due to their reliance on cheap labour and economies of scale which discourage future “positive long-run outcomes” (Ibid). These activities are not only predicated on cheap labour but often exploit environmental resources on which precolonial organisational structures depended, and therefore, inhibit a return to typically formerly agriculturally based economic systems in postcolonial periods. What is ultimately made clear through this study and others like it (see Dupuy, 1976; Njoh, 2007; Njoh, 2009), is that colonisation and the type of colonial rule have profound effects on contemporary social, economic, political and environmental conditions which, as we now understand, underpin constructions of disaster risk. It is therefore critical when applying a postcolonial perspective to disaster risk reduction practices and frameworks that researchers and practitioners engage deeply with historically rooted development trajectories in order to better address the underlying conditions that create risk.

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**“The world we inhabit is impossible to understand except in relationship to the history of imperialism and colonial rule.”**

Elam, 2019, p. 1

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The application and importance of incorporating a postcolonial perspective into DRR studies is demonstrated well through Oliver-Smith's 1994 paper, *Peru's Five-Hundred-Year Earthquake: Vulnerability in Historical Context*. In this paper, Oliver-Smith supports notions outlined by Hewitt (1983) that reject the "naturalness" of disasters or characterizations of disasters as "unhappy accidents that occur in otherwise 'normal' everyday existence" (Oliver-Smith, 1994, p. 74). Instead, they argue that disasters are "far more characteristic of societies than they are of physical environments" suggesting further that "they don't simply happen; they are caused" (Ibid). In fact, Hewitt (1983) specifically argues that disasters are more easily understood in the context of "normal" existence rather than "accidental geophysical features" and Oliver-Smith goes as far as to say, "natural phenomena would not even be disasters...or would cause far fewer damages, were it not for the characteristic 'normal' conditions of underdevelopment in which people have been forced to live" (Hewitt, 1983; Oliver-Smith, 1994, p. 74).

It is understanding disasters in the context of systemic everyday factors rather than extreme events that is most critical to combatting a return to 'normal' in the aftermath of natural hazard events, which is so often the unquestioned objective. In fact, it was American First Lady, Pat Nixon, who remarked that the US would support the victims of the 1970 Peru Earthquake until everything was "just rosy again" (Oliver-Smith, 1994), which so clearly fails to recognise that it was the normal conditions of everyday life that created vulnerability in the first place. Therefore, for true risk reduction, it is critical to understand and unpack the conditions that led to "normal", which in many circumstances, must rely on an exploration of postcolonial consequences. Oliver-Smith (1994) demonstrates this by arguing that the Spanish colonial conquest of the Inca Empire "undermined or subverted" indigenous adaptations to natural hazards that translate into the vulnerabilities Peruvians experience today (Oliver-Smith, 1994, p. 75). He categorises this subversion into "specific" and "systemic" processes, the former referring to the dismantling of conscious pre-Columbian adaptive strategies to natural hazards such as the use of specific building materials, land use patterns and distribution, architecture, and agricultural processes; the latter referring to the restructuring of socio-political and socio-economic systems that once reduced the translation of natural hazards into disasters such as institutional redistribution of surplus wealth and food in the aftermath of natural hazard events for use in recovery (Oliver-Smith, 1994). Using land use and distribution as an example, we can see the effects of this subversion throughout history. When the Spanish conquered the Inca Empire, they often settled themselves or resettled others in areas exposed to floods, landslides, or seismic activity, ignoring the intentional settlement patterns of indigenous communities that avoided these areas (Ibid). Oliver-Smith highlights this through the founding of Arequipa, which, although highly fertile, was sparsely populated until Spanish arrival (1994). Despite this incongruity, the Spanish founded the city of Arequipa in 1540, which unbeknownst to them, was in one of the most seismically active regions of the area (Ibid). In the 1600s alone, the city "suffered partial or total destruction by four enormous earthquakes and a volcanic eruption" (Cook, 1981; Oliver-Smith, 1994, p.81) and still experiences hazards today, ranking third in the world for exposure to volcanic activity (Krumholtz, 2018). Whether ignorant or uncaring of these pre-Columbian adaptations, Spanish settlement patterns and their indigenous resettlement initiatives during colonisation resulted in highly exposed populations that lacked adaptive capacity (Oliver-Smith, 1994). It is these conditions, initiated during colonisation, which still exist today and that ultimately result in natural hazard triggered disasters, lending truth to the description of Peru's 1970 earthquake as the "500-year-old earthquake".

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**[...] internationally adopted DRR initiatives motivate the development of new risk analysis frameworks that can better understand the relationship between exposure and vulnerability, and even further, the underlying causes of the exposure and vulnerability.**

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## **03. Analytical approach**

### **Disaster risk reduction analysis**

There have been many attempts to integrate DRR analysis into national policy agendas, yet in practice, it has been “slow and far from comprehensive” (Oliver-Smith et al., 2016, p. 12). Several internationally recognised strategies that aim to address disaster risk reduction have been developed, the most recent being the Sendai Framework for Disaster Risk Reduction 2015-2030 (SDFRR). It followed the well-received Yokohama Strategy and Plan of Action for a Safe World (1994) and Hyogo Framework Action Plan (2005) (HFA), which had at its core locally-driven initiatives and community input (Poterie and Baudoin, 2015). The SDFRR aimed to build on that by further establishing guiding principles that reduce existing risk, prevent new risk from accumulating, and strengthening resilience, among others and ultimately “Build Back Better” (UNDRR, 2015; Oliver-Smith et al., 2016). Central to its objective is understanding the underlying causes of disaster risk construction in an effort to better address DRR strategies from the international to local level. Yet, some argue that SDFRR has diverted away from the community-led approach, instead treating local partners more as “aid recipients” that must be provided with risk-related information rather than as actors who can contribute to the production of risk information (Poterie and Baudoin, 2015). Despite these criticisms, internationally adopted DRR initiatives motivate the development of new risk analysis frameworks that can better understand the relationship between exposure and vulnerability, and even further, the underlying causes of the exposure and vulnerability.

DRR practitioners have increasingly incorporated causal analysis models into their studies in an attempt to refine DRR strategies and better describe the relationship between risk construction and disaster events. Approaches such as the Pressure and Release model introduced by Blaikie and later Wisner maintains that the interaction of natural hazards and vulnerability, and the consequent inability of people or systems to cope with the scale or intensity of a hazard, is what results in a disaster event (Blaikie et al., 1994; Wisner et al., 2004, Oliver-Smith et al., 2016). Its foundation is based on the two interacting forces of generating vulnerability and exposure to physical hazards which can each place increasing pressure on the system as a whole. They further advocate, that to release the building pressure that comes from exposure, vulnerability, or both, measures need to be taken to alleviate building pressure by reducing vulnerability, which can be addressed by understanding both immediate and underlying causes of drivers of risk.

In order to identify the nature of these forces and the resulting consequences from their interaction with triggering hazards, researchers, practitioners and government bodies have taken the important step of incorporating descriptive analysis into DRR strategies. This process involves attributing “loss and damage” or impact of an identifiable “immediate cause” that results from a triggering event (Oliver-Smith et al., 2016, p.22). This takes the form of relating infrastructural damage to weak building codes after an earthquake (Oliver-Smith et al., 2016) for example, or the loss of livestock to drought, with the specific aim of associating differential consequences of exposed people, communities or elements to varying levels of vulnerability during hazard events (Ibid). In order to do so, there are four suggested themes within the field that require descriptive investigation, those being: triggering events, exposure of social and environmental elements, social and economic structure of exposed communities, and institutional and governance elements, which provide an initial step towards identifying how vulnerability to impacts manifest during triggering events. Under these themes, researchers are provided with suggestive, not exhaustive, lines of inquiry to better understand the scope of elements under investigation.

While this is a crucial step in disaster risk reduction efforts, as it helps to identify areas of exposure and vulnerability, it does not itself allow us to address the conditions that create risk. Further, it has the unintended consequence of categorizing causes into simply “unsafe conditions” which discourage a deeper analysis of relevant “deep-rooted, fundamental or structural causes” that underpin peoples’ and systems’ social construction of risk (Oliver-Smith et al., 2016, p. 13). To best assess the underlying causes of exposure and vulnerability, Oliver-Smith et al. (2016) developed the FORensic INvestigations of Disaster II (FORIN II) framework that operates as a mechanism by which underlying causes can be “evaluated and addressed” to develop “evidence-based prescriptions” that inform appropriate policy options and action (Oliver-Smith et al., 2016, p. 14).

## **Forensic Investigation of Disasters (FORIN)**

FORIN is a methodological framework that provides research guidelines to aid in the identification of “root-causes” of disaster risk. When applied, it is a tool by which DRR practitioners can investigate the causal relationships between the process of risk construction and disaster events through tailored research approaches. It ultimately aims to build on disaster causation studies but with the specific aim of making research guidelines more accessible and facilitating policy creation and implementation. It does so by “posing fundamental and easily understood questions”, the answers to which provide a far more robust image of disaster causation, allowing a deeper investigation into the underlying forces of risk construction (Oliver-Smith et al., 2016, p. 8).

There have been two iterations of the FORIN model, FORIN I (see IRDR, 2011) and FORIN II (Oliver-Smith et al., 2016), which were each released to provide “structured [scientific] engagement” with the HFA and SFDRR, respectively (Fraser, Paterson, Pelling, 2016, p. 2). FORIN I outlines the central themes and elements, while FORIN II addresses some of FORIN I’s shortcomings as well as refines its methodological approaches (Oliver-Smith et al., 2016; Fraser, Paterson, Pelling, 2016). When further discussing FORIN analysis, this paper will be referring to the FORIN II model.

## **Strong drivers of risk: beyond descriptive analysis**

As previously mentioned, the four themes requiring descriptive analysis provide a critical initial step in understanding disaster risk patterns and processes yet fail to understand the underlying causes of risk construction. Central to FORIN II analysis is going beyond descriptive analysis to identify disaster impacts and focusing instead on disaster risk construction. In order to do so, FORIN II favours investigating risk drivers that provide more “profound” insights into the “[cultural, social, ideological, pragmatic and political]” underpinnings of risk construction through a consideration of governance structures, organisation of production, institutional history, resource exploitation and behavioural practices, among others (Oliver-Smith et al., 2016). FORIN II is principally concerned with identifying strong drivers of risk that are fundamental to the social construction of risk which include interconnected topics of population growth and distribution, urban and rural land use patterns, environmental degradation and ecosystem depletion, and poverty and income distribution (Ibid). These serve as broad categories under which there are suggested questions to elucidate drivers of risk. Oliver-Smith et al. (2016) admits that these categories sometimes overlap with descriptive analysis and even suggests “[merging] or [separating]” questions in order to truly uncover the explanation between said categories and drivers of risk (p. 29). These strong drivers of risk will be briefly introduced below and further explored through a case study investigation.

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**FORIN II favours investigating risk drivers that provide more “profound” insights into the “[cultural, social, ideological, pragmatic and political]” underpinnings of risk construction through a consideration of governance structures, organisation of production, institutional history, resource exploitation and behavioural practices.**

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## **Population growth and distribution**

FORIN II analysis identifies population growth and distribution as highly influential drivers of risk and suggests research questions to illuminate the relationship between these processes and disaster construction. These research questions focus on: the underlying causes that drive population migration and settlement patterns; the natural and social mechanisms that determine settlement patterns; and the principal elements that dictate the settlement patterns across exposed or unexposed areas (Oliver-Smith et al., 2016). At its core, this category is attempting to explicate the motivating factors that determine settlement patterns, and ultimately what conditions force vulnerable populations to settle in exposed areas.

## **Urban and rural land use patterns**

Urban and rural land use patterns greatly influence the spatial distribution of risk and provides insights into the forces that determine which populations and which systems that people depend on are exposed to hazards. FORIN II allows for a temporal analysis of the evolution of land-use planning to ultimately determine what conscious efforts, if any, were applied that influenced the location of people, infrastructure and modes of production, among others (Oliver-Smith et al., 2016). Through guided research questions that expose which actors are involved in land-use planning, what policies or regulatory frameworks exist, and which are enforced, researchers can determine the underlying causes of the spatial distribution of exposed and vulnerable groups or systems (Ibid).

## **Environmental degradation and ecosystem service depletion**

Environmental Degradation and Ecosystem Service Depletion can be an underlying cause or factor in the previous two categories as it can strongly influence migration, settlement and land use patterns; however, it can also contribute to the construction of hazards themselves. The use, or misuse, of environmental resources can create conditions that increase the likelihood and severity of natural hazards as well as determine where people and practices exist. Thus, the research questions suggested to investigate this category relate to the motivating social, economic and political practices that promote environmental degradation, and further who benefits or is disadvantaged by such practices (Oliver-Smith et al., 2016).

## **Poverty and income distribution**

The final category of FORIN II root-cause analysis relates to Poverty and Income Distribution. It is widely understood that poverty levels as well as the unequal distribution of wealth have profound impacts on individuals' and communities' ability to prepare for, cope with, and recover from disasters. Therefore, it is critical to analyse poverty and wealth distribution in relation to constructions of risk. The suggested investigative questions aim to understand the degree to which poverty levels result in provable differential experiences of hazard impacts, with a specific focus on understanding contributors to chronic risk such as employment status, health status, and levels of social agency (Oliver-Smith et al., 2016). This focus on chronic vulnerability allows researchers and practitioners to better understand and, therefore, address the social, political, and economic conditions that create vulnerability in the first place.

## FORIN research approaches

FORIN II analysis offers four suggested research approaches to investigate root-causes of disaster risk. They include: Retrospective Longitudinal Analysis (RLA) which involves investigating the temporal development of systemic processes that create disaster risk; FORIN disaster scenario building which forecasts inevitable hazard events and their predicted impact on future disaster scenarios; Comparative Case Analysis which observes differential impacts of hazard events between varied social contexts; and Meta-analysis which systematically reviews literature to uncover similar or contrasting results within a diverse range of research focuses (Oliver-Smith et al., 2016; Fraser, Paterson, Pelling, 2016). Each approach is selected based on its relevance and appropriateness for a specific event or case study and can be adjusted through the adaptation, addition, or omission of suggested questions under each category of the previously mentioned risk drivers. As Oliver-Smith et al. (2016) notes, each approach in some way relies on the historical perspective offered through RLA, although as discussed above, they each exhibit individual angles that can be utilised depending on the analysis focus.

### **Retrospective longitudinal analysis: a postcolonial perspective**

RLA is predicated upon the notion that disasters are “far more than one-off” events, deeply rooted in history, social structures, political organization, and ecological relationships (Oliver-Smith et al., 2016, p. 32). It begins by identifying patterns of loss and retrospectively attributing them to social and environmental conditions that construct risk and result in hazard-related damages imposed upon vulnerable populations (Oliver-Smith et al., 2016). At its core, RLA provides a historical narrative of risk construction and its ultimate goal is to establish a causal chain between socio-organizational relationships and manifestations of hazard-induced damage and loss (Ibid). Critical to its goal is incorporating an understanding of “organizational scale” which maintains that regardless of the locality in which communities’ impacts are experienced, the forces that operate on the community and which the community exerts on others, is part of larger networks that are rooted in historical and global processes (Oliver-Smith et al. 2016, p. 34). Including this perspective allows researchers to observe the wider influence of international and national agendas on locally experienced hazards. It highlights that disasters are results of much wider and more broad-reaching conditions that manifest as unequal distributions of risk from international to local contexts.

To this effort, in many instances, RLA would benefit from and requires a post-colonial perspective when performing root-cause disaster risk analysis. While the approach calls for a historical perspective, it does not explicitly focus on a postcolonial interpretation of contemporary conditions. This paper, therefore, will adapt the RLA approach within the FORIN II methodology with the specific aim of investigating the drivers of risk and their socio-historical construction within colonial, neocolonial and postcolonial contexts. It ultimately aims to build on previous analyses by specifically identifying a causal chain between colonial practices exhibited in Saint-Domingue and the expression of vulnerability in contemporary Haiti.

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Once the wealthiest French colony — referred to as the “Pearl of the Antilles” (Dupuy, 1976, p. 27) — it is now the poorest country and only LDC in the Western Hemisphere (UN, 2018; FAO, 2018).

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## 04. Case study analysis

Haiti is a nation in the Greater Antilles Caribbean Archipelago located on the western third of the island of Hispaniola, which it shares with the Dominican Republic to its east. Once the wealthiest French colony—referred to as the “Pearl of the Antilles” (Dupuy, 1976, p. 27)—it is now the poorest country and only LDC in the Western Hemisphere (UN, 2018; FAO, 2018). It is plagued by weak governance structures, environmental degradation, poverty, and natural hazard-induced disasters prompting repeated interventions by NGOs in the absence of a strong state. So much so, that it is now sometimes referred to as a “Republic of NGOs” (Kristoff, 2010). However, experience has continued to show external interventions fail to address the underlying causes of risk and instead reproduce and reinforce the systemic inequalities that translate hazards into disasters.

**NOTE 01**

When measured as a function of number of people killed as a percentage of the country’s population (DesRoches et al., 2011).

These conditions culminated in the 2010 Earthquake—possibly the most destructive event in modern history<sup>1</sup> (Cavallo et al., 2010; DesRoches et al., 2011). This paper will proceed by deploying the RLA methodology presented in Chapter 3 with the aim of attributing the impacts of the 2010 Earthquake disaster and Haiti’s more general widespread vulnerability to its colonial and neocolonial history. Although Haiti is a frequent topic of disaster studies, this analysis will build on a robust body of literature by focusing on a postcolonial perspective. The analysis will therefore aim to establish an understanding of risk construction primarily from Haiti’s transition to a French colony to shortly after its independence, roughly 1690s-1830s. In doing so, this Chapter will not only provide a descriptive analysis of the immediate causes of the disaster but also uncover the origin of historically constructed risks that translated the earthquake into a major disaster.

## 2010 earthquake: descriptive analysis

Following FORIN II's RLA approach we will begin by providing a descriptive analysis of the immediate impacts of the 2010 Earthquake. On January 12th, 2010 a 7.0 magnitude earthquake struck Haiti 25km southwest of the capital city, Port-au-Prince (World vision, 2019; Pallardy, 2019). It was the most destructive natural hazard event in the nation's history, and although reports vary, it is estimated that around 250,000 people died, 300,000 people were injured, and at least 3 million people were affected—roughly 25% of the population at the time of the event (DesRoches et al., 2011; World vision, 2019; Pallardy, 2019). To put this into perspective, the average annual death toll over the last decade from natural hazard-induced disasters is 60,000 globally, with the majority of events resulting in 10,000 deaths or less (Ritchie and Roser, 2014). The widespread devastation experienced during and following the 2010 Earthquake is most often attributed to a lack of and poorly enforced building codes permitted under Haiti's weak governance structures and low institutional capacities (Oliver-Smith et al., 2016, 35). This is evidenced by the fact that up to “60% of the nation's administrative and economic infrastructure was lost, and 80% of the schools and more than 50% of the hospitals were destroyed or damaged”, many of which remain in a state of disrepair (DesRoches et al., 2011, p. 21; Pallardy, 2019).

The weak governance structures that allowed for many of the immediate pre-conditions leading up to the disaster cannot be viewed in isolation; they can be traced back to the dictatorship of François “Papa Doc” Duvalier, Haiti's President from 1957-1971. This period in Haiti's history is explored in detail by Beckett's (2014), *The Art of Not Governing Port-au-Prince*, which details the “slumification” of the city as an expression of “statelessness” (p. 31). Throughout its history and, in particular, during the Duvalier dictatorship, Port-au-Prince has become a symbol of “weakness or absence of the Haitian State” (Beckett, 2014, p. 32). The city has been deemed “ungovernable” by some due to its lack of capacity and apparent lack of will to address the needs of its citizens rendering it wholly ineffective as the seat of administrative and political power (Beckett, 2014). While these conditions certainly explain the immediate impacts of the earthquake, it does not fully explain the high levels of socio-economic vulnerability within the city and throughout Haiti. To understand the high degree of destruction that occurred, we must investigate the interconnected social and historical constructions that created this vulnerability in the first place. The point of departure in this paper is, therefore, the explicit focus on risk construction during Haiti's colonial period as Saint-Domingue and subsequent influence that has on contemporary expressions of vulnerability.

## The colonisation of Haiti

As discussed in section 4.1, the level of destruction resulting from the 2010 earthquake cannot be fully understood through descriptive analysis of the immediate causes of disaster impacts. Rather, it requires a more in-depth investigation of the creation of underlying risk drivers from a postcolonial perspective. In doing so, we can more appropriately and comprehensively apply historical processes to the construction of risk with the broader aim of informing disaster risk reduction interventions that target root-causes. This section will proceed by providing a brief historical overview of the transition from Pre-Columbian Haiti through to the end of Spanish colonisation intended to give context to the founding of Saint-Domingue.

### Pre-columbian Haiti

Although first inhabited as early as 5000BCE, Arawak peoples, primarily a branch called the Taíno, settled on the island around 1200AD (Dupuy, 1976). Taíno society was socially and politically organised around egalitarian, communal modes of production in a manner that was in relative harmony with

environmental resources (Ibid). Production and the tools used for production were for use rather than exchange and the distribution of goods was under the immediate control of the producers (Ibid). Economic and political organisation consisted of five autonomous clans under the leadership of a cacique, or clan leader, which was comprised of various family units or kin relations (Ibid). Although there was limited stratification within the society, over time divisions in labour developed but what always remained was control over production by producers. These political, economic, and ecological relationships would be radically altered by colonisation and would have profound effects on environmental degradation, population distribution, poverty levels, and land use patterns.

### **Haiti during Spanish colonisation: Hispaniola (1493-1697)**

The story of risk construction in Haiti begins in large part with the Spanish colonisation of the island of Hispaniola. Spanish Colonisation of the Island in the 1490s would dramatically reorient the social and economic foundation of Taíno society from a communal mode of production to a capitalist mode of production (Dupuy, 1976). Spain's primary motivation for colonisation was to extract precious resources, namely silver and gold, which it would use to finance further colonial expansion and protect and support the empire as a whole. The search for precious metals required an increasing supply of labour, which was initially supplied by the native population justified under catholic evangelisation. As a result, Spanish colonies were organized into *encomienda* systems in which "the state parcelled out native populations to individual conquistadores" as their personal labour supply whom they were required to educate and convert to Catholicism (Dupuy, 1976, 16). Yet, the Taíno, due to their predilection towards egalitarianism was "not accustomed to servility, and their enslavement or forced labour eventually resulted in their complete annihilation" (Ibid). To satisfy their need for precious metals, Spain quickly set their sights on mainland South America which was rumoured to have large supplies of silver and gold, resources that were relatively lacking on the island (Dupuy, 1976). Hispaniola's rich agricultural lands lent better to activities such a sugarcane production; a fact not lost on the French Empire. Due to Spain's interest in other territories, France was able to gain a foothold on the island by 1659 after a series of conflicts between the two empires. The western-third of Hispaniola was officially ceded to the French in 1697, establishing the French colony of Saint-Domingue to the west and the Spanish colony of Santo Domingo to the east (Ibid).

### **Social construction of risk: from Saint-Domingue to Haiti**

Now that we have briefly discussed Hispaniola during Pre-Columbian Taíno society and Spanish colonisation, we will proceed by exploring the origins of practices that influence poverty and income distribution, environmental degradation and ecosystem services depletion, urban and rural land use patterns, and population growth and distribution established during the roughly 100 years of French colonisation in Saint-Domingue. It ultimately aims to demonstrate that practices initiated during French colonisation laid the foundation for much of Haiti's contemporary underdevelopment and vulnerability to natural hazards.

Although there are more proximal root-causes of risk in Haiti, established during US occupancy of the island through force from 1915-1934 (and in practice until 1947) (see Fass, 1998; Oliver-Smith, 2010) and the Duvalier dictatorship (see Beckett, 2014; Oliver-Smith, 2010; Oliver-Smith et al., 2016), many of Haiti's vulnerabilities trace back to processes set in motion during its colonial past and, therefore, will be the principal focus of the case study analysis within this paper. The following sections will each begin by characterising the current

vulnerabilities experienced within Haiti, and then proceed by identifying their root-causes in practices and institutions established in Saint-Domingue under each category of strong drivers of risk in the FORIN II methodology.

## **Poverty and income distribution in Saint-Domingue and Haiti**

As mentioned above, Haiti is the only LDC in the western hemisphere. It is estimated that over 6 million Haitians live below the poverty line and over a third fall below the extreme poverty line (World Bank, 2009). Although poverty is more widespread in rural areas, high income inequality in urban areas renders the experiences of poverty more acute (Jadotte, 2006). The majority of people survive through subsistence farming, although many farmers rely on degraded marginal hillsides (Lawless et al., 2019). While agricultural production and natural resources extraction in rural Haiti once provided the nation with the majority of its GDP, “this wealth has systematically been siphoned from rural areas to the capital with little returning to the countryside in the form of infrastructure or development” (McClintock, 2003, p. 1). The economy is now overwhelmingly dominated by clothing and footwear exports supplied by cheap, unskilled laborers living on the outskirts of urban centres (McClintock, 2003; Beckett, 2014). Yet, due to weak institutions, repeated natural hazard events, and neocolonial trade arrangements, the country has been unable to stabilise its economy. Ultimately, the government has low financing capabilities and is largely unable and unwilling to address the many vulnerabilities faced by its population. Such severe poverty and weak institutions render the country unable to cope with the impacts of natural hazard events. After the 2010 Earthquake, over 1 million people were left homeless, many forced to squat in “tent cities” constructed out of donated tents and scrap material, in which thousands still remain over a decade later (Pallardy, 2019; Charles, 2020). As a result, these people are made more vulnerable to natural hazards and are unable to escape the cycle of poverty.

Extreme poverty and high income inequality, although exacerbated by neocolonial trade policies, are consequences of systemic processes established by the French in Saint-Domingue. Unlike Spain, France was primarily interested in using Saint-Domingue as an extractive colony rather than a trading hub positioned between South America and Europe. Its primary focus was sugar cane cultivation and coffee, along with cotton, indigo, and tobacco, as the island’s rich agricultural soils and tropical climate lent well to highly productive plantations (McClintock, 2003). The “annihilation” of the Arawakan peoples resulted in a labour shortage to work the rural plantations which was remedied by imported slave labour of African descent. Income distribution consisted of a majority African descent slave population and a minority colonial elite who maintained control over virtually all economic production and wealth. This wealth would be channelled to the colonial capital, Cap Francais, and in large part back to the French Empire, quickly making Saint-Domingue France’s wealthiest colony (McClintock, 2003; DesRoches et al., 2011). At its height, African slaves produced “40% of all sugar and 60% of all the coffee consumed in Europe” for the enrichment of European plantation owners and “their offspring with slave concubines” (Oliver-Smith, 2010, p. 33). Over time, a free mixed-race class emerged that accumulated wealth and power themselves who did not necessarily agree with or possess the same motives as the European colonial elites (Dupuy, 1976). This newly emerging class along with maroons (runaway slaves) would gain motivation from the French Revolution and would eventually spur the Haitian Revolution leading to the colony’s independence 1804 (Oliver-Smith, 2010).

In response to Haiti’s independence, a series of largely racially motivated international policies would cripple its economic development. France refused to accept the new republic until the economic value of “lost property”, primarily slaves and land, was recovered, valued at 90 million Francs (reduced from 150 million Francs) (Oliver-Smith, 2010, p. 34). Under threat of French invasion and through U.S. and U.K. supported trade embargoes, the Haitian govern-

ment and elites arranged an “extraction process” to satisfy debt obligations beginning in 1825 that allowed them to accumulate wealth and power while the nation’s natural resources degraded (Ibid). It would take Haiti over 100 years to pay off their debt forcing the country to export natural resources principally consisting of timber and to take out a series of high-interest loans eventually paying it off in 1947 (Oliver-smith, 2010). These extortionary practices weakened the country’s environmental and economic foundation and would set a trajectory towards severe underdevelopment.

### **Environmental degradation and ecosystem services depletion in Saint-Domingue and Haiti**

Environmental degradation and ecosystem services depletion in Haiti, are among the most influential drivers of risk. These drivers are well studied, yet few reports acknowledge that the underlying factors are deeply rooted in colonialism. Once a lush tropical island nation, only 3% of Haiti’s surface is now covered by forest, in stark contrast to its relatively densely forested neighbour, the Dominican Republic (DesRoches et al., 2011), as illustrated in Figure 4.1.

**FIGURE 4.1**

Haiti/Dominican Republic border illustrating difference in tree coverage. In Sobat, P., 2017. From Vox “Borders”. Source: [Blurredculture](#)



Forests that once provided critical ecosystem services such as water retention and soil stabilisation have been almost entirely harvested for fuel or cleared for cultivation (Smith and Hersey, 2008). The unsustainable use of hardwood as fuel was a practice initiated under French colonisation but has persisted into contemporary times (Lawless et al., 2019). According to Hersey and Smith (2008), “trees are used as fuel for cooking and other activities involving fire” and further, the lack of available fuel alternatives forces “industries not normally attributed to fuel wood consumers” to be dependent on and require a “high demand” of firewood (p. 869). It is estimated that 85-90% of the energy consumed for either home or industrial purposes is supplied by charcoal or firewood gathered from Haiti’s few remaining forests (McClintock, 2003).

The lack of forested areas prevents water from being easily absorbed into the ground and soil is easily eroded without tree roots stabilising surface sediment. As a result, topsoil is washed downstream over time, leading to “excessive silting” and the accumulation of “heavy sedimentation” reducing drainage and increasing salinity levels of the soil (McClintock, 2003, p. 3). It is estimated that in some areas of the country silting has reduced river flow by 80% when

compared to 1960s levels (McClintock, 2003). Not only does this reduce the fertility of the soil on which Haiti's predominantly subsistence farmers depend, but results in extreme flood events, often leading to largescale disasters. Such events further discredit the notion that disasters are "natural" events, as Haiti's severe flooding is almost entirely a product of environmental mismanagement. This is made evident during Haiti's many flooding events and, for example, during Hurricane Jeanine in 2004 in which Haiti was "inundated with water" resulting in several thousand deaths and millions of dollars of infrastructural damage as "tons of soil was eroded from the hill sides to the sea" due, in large part, to deforestation (Smith and Hersey, 2008).

Deforestation, although always a part of Haiti's history, was greatly "accelerated during the period of French colonisation" (Smith and Hersey, 2008, p. 869). As previously mentioned, the French used Saint-Domingue as an extractive colony primarily interested in sugarcane cultivation and coffee production (DesRoches et al., 2011). This not only required a robust labour force but the clearing of vast quantities of primarily hardwood forests to provide the necessary land and fuel for sugar production (Smith and Hersey, 2008). Coffee was introduced to the island in 1730 and within 50 years, a quarter of the colony's land was devoted to the cultivation of the crop (McClintock, 2003). However, soil productivity quickly and dramatically declined, forcing colonists to increasingly clear more forests in search of fertile land. This would continue long after independence, as neocolonial debt repayments to France would largely be made in the form of natural resource extraction, namely timber and cash crop exports including coffee and sugar (McClintock, 2003; DesRoches et al., 2011).

Intensive monocropping along with the previously mentioned deforestation significantly degraded the soil and increased erosion, the effects of which are still experienced today as subsistence farmers are forced to move into increasingly hillier terrain exposing them to greater risk of landslides. The land can no longer support robust agricultural operations and laborers have been forced to migrate to urban areas in search of employment. This, in large part, contributed to the rapid, unplanned urbanisation that created highly exposed populations which were hit hardest by the 2010 Earthquake.

## **Urban and rural land use patterns in Saint-Domingue and Haiti**

The contemporary expression of Haiti's urban and rural land use patterns is deeply intertwined with its economy, topography, and colonial history. Agriculture is Haiti's largest economic sector accounting for 25% of total GDP and 50% of total employment (FAO, 2018). These figures rise to "66% in rural areas and 75% in low-income households" making it a critical source of income for much of Haiti's most vulnerable populations (FAO 2018, p. 2). Although fertile, environmental degradation and its hilly terrain render only 20% of the land arable, yet 50% of the land is under cultivation (McClintock, 2003). Intensive agricultural operations are largely confined to the fertile Artibonite Valley while primarily poor subsistence farmers have been forced to cultivate the island's steep rural hillsides at risk of landslides and crop failure (Ibid). The produce, livestock and crops cultivated in the rural areas are channelled to urban areas, namely Port-au-Prince, for consumption, processing and export, with little money returning to the many small-scale rural farmers (Ibid). This process of rural food production and urban consumption/export is a relic of Haiti's origins as a colony founded on a plantation economy.

During French colonisation, rural land was converted into plantations worked by slave labour for the production of cash crops, the wealth accumulated from which was transferred to colonial elites who typically resided in the colonial capital, Cap Francais, now known as Cap Haïtien (Goldberg, 2007). The fertile valleys and sloping hills were converted into plantations for intensive monocropping while the "steep marginal slopes" were allocated to slaves for subsistence farming (Lawless et al., 2019). Yet, soil productivity quickly declined (Ibid) and hillside erosion led to reoccurring landslides reducing the availability

of already limited land. The unequal distribution of land would continue after independence, as higher altitude plantations were reserved for coffee production and fertile valleys were devoted to sugarcane cultivation, while poor farmers were permitted only to plant on “marginal slopes between 200m and 600m” (McClintock, 2003, p. 4).

It is evident in today’s expression of urban and rural land use patterns that practices initiated during French colonisation have persisted. Poor subsistence farmers continue to be marginalised as natural resources and agricultural exports are directed towards the urban centres, then Cap Francais, now Port-au-Prince. Environmental degradation reduces the availability of already scarce arable land forcing farmers into increasingly unsuitable areas and cities in search of alternative employment. In fact, environmental degradation would alter urban and rural land use patterns over time greatly influencing another contributor to risk, population growth and distribution.

## **Population growth and distribution in Saint-Domingue and Haiti**

Haiti’s population growth and distribution in large part followed patterns related to the previously mentioned risk drivers, being shaped heavily by poverty and environmental degradation. Although considered somewhat of an anomaly due to its relatively high agriculturally based rural population, it is becoming an increasingly urbanized nation (Beckett, 2014). Today, it has a population of approximately 11.4 million with roughly 57% living in urban environs (Worldometer, 2019; Population Stat, 2019a; World Population Review, 2020). Its capital city, Port-au-Prince, and greater metropolitan area contains over 2.7 million people, nearly a quarter of the country’s population (Population Stat, 2019b). The capital was hit hardest by the 2010 Earthquake due to its large population and poor urban planning and management. Additionally, the city was still recovering from severe tropical storms during the 2008 wet season that significantly damaged infrastructure (Pallardy, 2019).

The large majority of the population are of African descent and after its independence, it was considered “the world’s first black republic” (Oliver-Smith, 2010, p. 33). According to Encyclopædia Britannica (2000), the ethnic composition of contemporary Haiti is 94.2% black, 5.4% “mulatto” (“a people of mixed European and African descent”), and 0.4% other, a clear relic of its colonial past.

After the annihilation of the indigenous Taíno people, Saint-Domingue required an alternative labour source satisfied by the import of black, west-African slaves. It is estimated that in 1789, Saint-Domingue had a population of 556,000 consisting of “roughly 500,000 African slaves—a hundredfold increase over the previous century—32,000 European colonists, and 24,000 affranchis (free mulattoes or blacks)” (Pallardy, 2019). African slaves lived and worked on rural plantations, while colonial elites resided in the wealthy capital, Cap Francais. This structure largely remained after independence as newly freed slaves attempted to cultivate marginal hillsides allotted to them during slavery, while plantations were used to accumulate wealth in the capital and for indemnity payments to France.

Although shifts in much of Haiti’s population distribution have occurred in more recent times, it is largely a product of the delayed impacts of previous risk contributors. Environmental degradation and deforestation consistently depleted the quality of agricultural lands rendering it difficult for subsistence farmers to survive. As a result, there were mass migrations to urban areas as rural peasants moved in search of employment. Port-au-Prince and other urban centres were unable to cope with the rapid urbanisation, resulting in numerous highly exposed informal settlements and development projects lacking proper building codes. These communities would ultimately be hit hardest by the 2010 Earthquake, with those who survived forced to move into even more exposed circumstances, vulnerable to the impacts of future natural hazard events.

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**While the above discussion is not intended to be a comprehensive narrative of risk construction in Haiti, it aims to explain how the impacts of colonisation have influenced more proximate causes to Haiti's current vulnerability.**

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## 05. Discussion

The analysis in Chapter 4 aims to add to the historical narrative of risk construction in Haiti by investigating the practices that influence strong drivers of risk initiated during its colonial period. In doing so, we can better understand the origins of systemic and institutional processes that render Haiti vulnerable to natural hazards today.

Further analysis reveals that after independence, Haiti was ostracised by many European powers and their Caribbean colonies for fear of inspiring further slave rebellions (Lawless et al., 2019). In the US, free states viewed it as an opportunity to trade but slave-owning states took every effort to “suppress news of the rebellion” (Lawless et al., 2019). France only recognised Haiti's independence in 1825 after the new nation agreed to exorbitant indemnity payments that would ultimately cripple its economic development (Lawless et al., 2019; Oliver-Smith, 2010; Oliver-Smith et al., 2016). This agreement was arranged by government officials and wealthy elites who would continue “draining the nation's resources” while “impoverishing the population with brutality, militarism, mismanagement and corruption” (Oliver-Smith et al., 2016, p. 35). This arrangement encouraged further widespread environmental mismanagement and deforestation from which Haiti has still not recovered, contributing to the intensity and frequency of natural hazards experienced today. During this time, a “huge gulf” developed between the minority light-skinned, French-speaking, wealthy urban elite and the overwhelming majority “black, Creole-speaking peasants” (Lawless et al., 2019). Rural areas remained almost entirely undeveloped as the new capital, Port-au-Prince, became “the centre of culture, business, and political intrigue” (Ibid).

The U.S. occupied Haiti from 1915-1934 under the guise of humanitarian grounds after the assassination of the then Haitian president, although it was truly to protect U.S. investments and secure control over the Panama Canal (U.S. Department of State, 2007; Lawless et al., 2019). During this time black Haitians felt excluded from office and unable to participate in the development of their country. Eventually, Francois “Papa Doc” Duvalier was elected in 1957 on the promise that he would economically and politically empower the black majority, ending mulatto elite domination (Ibid). Yet, political unrest resulted in an attempted coup which prompted Duvalier to retaliate with violent para-

military groups to maintain control (Ibid). His more than decade-long regime and following dictatorship under his son, Jean-Claude “Baby Doc” Duvalier, was characterised by widespread corruption, human rights abuses, financial misappropriation, and theft (Lawless et al., 2019; Oliver-Smith et al., 2016). At the same time, in response to an African swine flu virus outbreak, US AID “ordered the slaughter of all of Haiti’s pigs” which was “the source of peasant savings, emergency capital and nutrition” (Oliver-Smith et al., 2016, p. 35). Further, US AID intervention devastated the rural economy by flooding the market with rice surpluses, undermining local producers (Oliver-Smith et al., 2016). Unable to continue farming degraded marginal hillsides, rural peasants migrated to “hillside shanty towns” and “festering slums” near Port-au-Prince and other urban centres in search of employment (Beckett, 2014; Oliver-Smith et al., 2016, p. 35). The lack of institutional capacity and weak governance structures rendered the state unable to effectively enforce appropriate building codes and urban planning measures, exposing highly vulnerable populations to a number of natural hazard-related risks. These conditions would ultimately culminate in the devastating impacts of the 2010 Earthquake.

While the above discussion is not intended to be a comprehensive narrative of risk construction in Haiti, it aims to explain how the impacts of colonisation have influenced more proximate causes to Haiti’s current vulnerability. It also aims to highlight that Haiti’s conditions of underdevelopment are, in large part, a consequence of racist, exploitative international power structures that still persist today.

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**Haiti’s conditions of underdevelopment are, in large part, a consequence of racist, exploitative international power structures that still persist today.**

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**by understanding the origins of the root-causes of vulnerability in Haiti, we can better address reconstruction efforts in a manner that reduces, rather than reproduces existing vulnerabilities.**

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## 06. Conclusion

This paper aimed to establish a causal chain between the impacts of French colonisation and Haiti's contemporary expression of vulnerability to natural hazards, evidenced by the severe destruction resulting from the 2010 Earthquake. It did so, by investigating strong drivers of risk outlined in the FORIN II methodology RLA approach during Haiti's period as the French colony of Saint-Domingue. In doing so, we uncovered that severe deforestation, extreme poverty, environmental degradation, poor urban planning, weak governance structures and systemic racism, among other contributors to risk, have their foundations in practices initiated during colonisation.

While this paper endeavoured to contribute empirically to the literature on risk construction in Haiti, it also served to demonstrate the value of applying a postcolonial perspective to the field of DRR. By doing so, we can better uncover the systemic and institutional structures that contribute to vulnerability under "normal" circumstances, rather than viewing natural hazards as unfortunate extreme geophysical events. The FORIN II framework lends well to this type of study, with the RLA approach presenting useful opportunities to explore development trajectories through a historical lens, which can (and should) be applied to any postcolonial state. Yet, FORIN II's application doesn't end there. Future research can extend beyond the RLA approach, instead adopting FORIN II's Comparative Case Analysis approach, for example, which examines the impact of natural hazards on vulnerable populations in varied contexts. This approach would be particularly interesting through a case study of Haiti and the Dominican Republic to better understand how the different colonial practices and objectives between the French and Spanish resulted in different levels of vulnerability to shared natural hazards. Ultimately, this paper aims to encourage a larger DRR research agenda, one that acknowledges and incorporates the deeply rooted structural underpinnings of vulnerability, many of which we'll find originate in colonial histories.

Hopefully, by understanding the origins of the root-causes of vulnerability in Haiti, we can better address reconstruction efforts in a manner that reduces, rather than reproduces existing vulnerabilities. To this effort, the international community can begin by empowering local Haitians to participate in political processes, allowing them to inform disaster risk reduction strategies and support development trajectories that reduce their exposure and vulnerability to natural hazards in the future.

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