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## **Bachelor Programme in Development Studies (BIDS)**

### **Vulnerability and contemporary threats to Jamaican Disaster Management**

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## **Abstract**

Natural hazards and disasters are serious contemporary threats as climate change is causing an increase in the frequency of extreme weather conditions worldwide. The Caribbean is geographically located in the North Atlantic Ocean at the junction of the Caribbean Plate and the North American Plate. The region is in a high-risk zone for natural disasters such as earthquakes and hurricanes. In the specific case of Jamaica, underdevelopment is one of the main consequences of the islands colonial legacy that in return is causing widespread political corruption and socio-economic deprivation within a large number of communities. This in turn increases the vulnerability to natural disasters. The very purpose of this thesis is to examine the factors that affect Jamaica's vulnerability and ability to manage natural disasters in a contemporary context. The most prominent factors in this regard, as argued by the author, include political corruption, squatter settlements, criminality and insurances. These causes of vulnerability are analyzed through an analytical framework developed from the Disaster Pressure and Release Model. Moreover, this thesis concludes; among other things that political corruption and foreign debt are two related factors that affects both Jamaica's vulnerability and recovery in the aftermath of a natural disaster.

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# 1. Introduction

## 1.1. Introduction

Disaster management systems world wide are by all means dependent variables of development. Natural hazards and disasters are annually killing approximately 60 000 people - 90 % of these deaths occur in developing countries. Poorly constructed buildings is the main cause of the higher death rates in developing countries, especially in the events of earthquakes. In 1988 an earthquake struck Armenia killing 25 000 people. The following year, an earthquake with twice the magnitude struck San Fransisco, but the death toll was only estimated to approximately 100 people (World Bank 2009, p 2).

While the most destructive disasters in terms of death toll affect the developing countries, the financial element affects the developed countries with respect to property damage. Even though the buildings are more resilient to natural hazards in the developed world, the density of economic activity is higher. If a natural disaster was to strike an urban area such as New York or Hong Kong, it would have a major financial impact on both a national and international level. Recent studies made by the World Bank imply that the most costly natural disasters are in forms of hurricanes, typhoons and storms while the most deadly in terms of death toll are prominently earthquakes (World Bank 2009, p 3).

Jamaica is located within the Caribbean which is a region prone to natural hazards. In 2004 and 2005, the three hurricanes of Ivan, Dennis and Emily struck the island and clearly exposed just how vulnerable Jamaica is to this disaster. However, the Caribbean is a region that is also highly vulnerable to seismic activity, which was manifested by the destruction of the Haiti earthquake in 2010 (Emergency Preparedness and Response, 2004). Other natural hazards that are common in Jamaica include floods, landslides and drought (Types of hazards & disasters, 2008).

Jamaica is ranked among the very poorest nations in the Caribbean; only Haiti has a lower GPD per capita. As development and vulnerability are two correlated variables, the lack of socio-economic development in Jamaica is causing problems to the disaster management system (Vulnerability and Poverty Reduction, 2012).

*The purpose of this thesis is to investigate the factors that affect Jamaica's vulnerability and ability to manage natural disasters in a contemporary context.* By "managing natural disasters" this thesis refers to the processes of disaster preparedness, mitigation, response and recovery, all of which are included in the notion of disaster management. The empirical study made will be based on the analytical framework developed from the Disaster Pressure and Release Model. Thus with this purpose in mind, the overall research question is the following:

*"What prominent factors affect Jamaica's vulnerability and ability to manage natural disasters?"*

The relevance of this topic is immense as research claim that the frequency of natural disasters is increasing, and that it will continue to do so as a consequence of climate change and global warming. This thesis will contribute to the existing knowledge about underlying factors that increase vulnerability and hamper an efficient disaster management system relevant to the specific case of Jamaica.

Moreover the disposition of this thesis is as follows:

The first part of this thesis summarizes the materials and methods used along with data collection and delimitations. This section is followed by the theoretical framework where both the Disaster Pressure and Release Model and the General Strain theory are depicted and evaluated. Moreover, the analytical framework contains a reconstruction of the Disaster Pressure and Release Model named "Progression of Vulnerability in Jamaica" (PVJ). This model makes up the framework for the empirical study and analysis of this thesis.

The second part deals with the root causes within the PVJ, and more specifically political corruption in a Jamaican context. It is evaluated how the phenomena of political corruption relates to the infrastructural network of the island and how these relations affect disaster management.

The second part highlights the dynamic pressures of the PVJ represented by the squatter settlements. It is noted that marginalized communities experience many issues such as unsanitary conditions and fragile facilities that have big impact on vulnerability in Jamaica.

The third part describes the unsafe conditions within the PVJ. In this section, the General Strain theory is provided as an instrument of evaluation in regards to socio-economic deprivation and disaster preparedness. Moreover, the unsafe conditions are further represented by the notion of Jamaican insurances. Here, the international insurance pool of CCRIF is depicted and individual insurances in a Jamaican context are evaluated.

The three topics of root causes, dynamic pressures and unsafe conditions are ultimately analyzed through the PVJ in the fourth section. The model not only determines whether or not Jamaica can be regarded as vulnerable against natural hazards, but it also addresses the main causes to why that might be.

The final part of this thesis includes discussion and conclusions where topics and threats are summarized.

## 1.2. Material and methods

### 1.2.1. Research method

This thesis uses a qualitative research design with elements of quantitative data, and has a mainly inductive approach. The inductive approach means in this case that the primary and secondary data that was collected provided guidance for the choice of theories, i.e. the Disaster Pressure and Release Model (that evolved into the analytical framework) and General Strain theory (Bryman 2008, p 12). Moreover, the conclusions of this thesis are mainly products of the empirical material gathered.

The qualitative research is necessary in order for the thesis to provide in-depth knowledge regarding the contemporary threats and challenges to the Jamaican disaster management system. The quantitative data on the other hand provides information about insurances and is collected through a survey at the Manchester Parish Council, and then recoded and documented in SPSS (see below).

This thesis is a case study of Jamaican disaster management and causes of vulnerability. The case study per se is motivated by a field trip to Manchester Parish, Jamaica. An analysis of an individual case allows this thesis to focus mostly on Jamaica and thus provide an in-depth dimension. Robert K. Yin introduces the concept of exemplifying studies where *“the objective is to capture the circumstances and conditions of an everyday or commonplace situation”* (Yin 2003, p 41). This Jamaican case study could be defined as a typical exemplifying study. In terms of the Caribbean context, Jamaica is representative to a number of neighboring states as they share economic and political structures as well as the colonial legacy. However, in many regards, Jamaica is also a unique case without any equivalents. Moreover, as Jamaica is the major case in this study, without any additional comparative cases, a comparative research design is not suitable. A comparative design would entail a study of at least two contrasting major cases; for example Jamaica and the United States (Bryman 2008, p 58). Also, if many cases were to be used from a single point of time, a cross-sectional research design would be the most useful strategy (Bryman 2008, p 44).

### 1.2.2. Data collection

A total of 6 interviews were conducted with individuals in both Jamaica and Sweden. During a field trip to Jamaica that took place between January 17 and March 14, two semi-structured interviews were conducted with the disaster coordinator in Manchester Parish, La-Jean Powell. One additional personal interview was conducted after the field trip with the fire fighter Gabriel Abdellah. Three additional interviews were held over email with Jerker Albin, head of Risk Consulting at Willis Insurance, Insurance broker Thommy Ohlsson at Willis Insurance as well as the Masters student in Development Studies currently living in Jamaica, Olivera Bogicevic.

All of these interviews had a semi-structured approach (see “Appendix – Interviews”) which allowed the author to probe the interviewee. Through probing, information that was initially not considered was obtained (Bryman 2008, 206). Wide questions were asked in order to give the interviewee leeway in how to reply. Furthermore, this approach essentially involves a great deal of freedom as the interviewer doesn’t have to entirely follow a specific scheme of questions, which is the case within the structured approach (Bryman 2008, p 438).

La-Jean Powell was interviewed in Jamaica because of her expertise, but equally importantly because her convenient office location (see “delimitations”). In Sweden, the interviewees were chosen solely because of their expertise. All of the personal interviews, both in Sweden and Jamaica, were conducted by asking predetermined as well as spontaneous questions that were recorded. The recording of the personal interviews was essential as many words otherwise could have been misinterpreted due to language barriers and obscurity (Bryman, 2008, p 202). All of these interviews were later transcribed from the audio version onto paper.

Furthermore, individuals that were interviewed via email were chosen through recommendations. They all had specific knowledge relevant to the different topics within this thesis. Jerker Albin and Thommy Ohlsson are insurance professionals and Olivera Bogicevic lives and works in Jamaica and has expertise regarding both social trust and to some extent, squatter settlements. But as both Jerker Albin and Thommy Ohlsson were very busy during the writing of this thesis, and Olivera Bogicevic lives in Jamaica, an email interview seemed to be the most appropriate and convenient alternative. Everything written during these interviews was saved.

An additional survey was conducted in Jamaica at the Manchester Parish Council. The 19 individuals that participated were staff at the council (see “Appendix – Questionnaire”). The initial purpose of the sample was to evaluate to what extent insurance coverage and fire extinguishers is purchased among a specific group of Jamaicans. This group of people was surveyed because of their financial status (middle-income takers) and once again because of their convenient location. The survey is defined as a non-probability sampling where the individuals questioned were selectively chosen beforehand. The non-probability approach essentially means that the result isn't as representative of the entire population as it would have been in the case of a probability sample. However, this approach was chosen because of its convenience rather than its significance. In terms of the actual result, it was coded into SPSS. The reason for choosing SPSS rather than a more simplistic program such as Excel is because of the authors lacking expertise in the latter.

Moreover, apart from the primary data used, this thesis also contains secondary data in forms of web pages, reports & journals, books, publications and documentaries. These secondary materials are both complimentary as well as comparative to the primary data.

### ***1.2.3. Delimitations***

The author of this paper initially intended to conduct more interviews during the field trip, but due to unsafe conditions in forms of high murder rates as well as recommendations from supervisors not to travel alone, the personal interviews during the field trip were restricted to two. This implies that the result will be biased as the opinions of only one disaster coordinator have been conducted, in contrast to the three interviews with coordinators that was the initial ambition. The results in this thesis thus do not represent the entire population of Jamaica. An additional survey was conducted at the Manchester Parish Council with regards to the insurance phenomenon.

Some of the references used in this thesis are unpublished and lack authors. But as research on Jamaican disaster management is limited, the selection of adequate references is scarce.

## 2. Theoretical framework

### 2.1. Disaster Pressure and Release Model

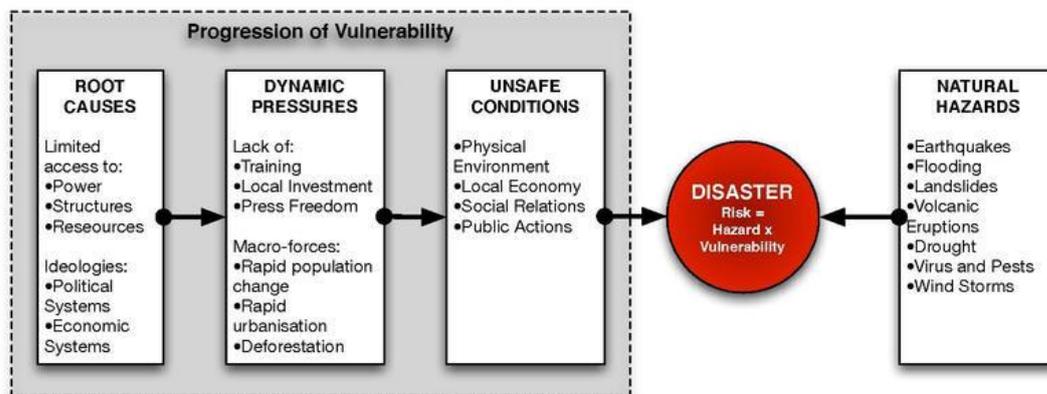
The definition of a natural disaster used in this thesis is “when a significant number of vulnerable people experience a hazard and suffer severe damage and/or disruption of their livelihood system in such a way that recovery is unlikely without external aid. By recovery we mean the psychological and physical recovery of the victims and the replacement of physical resources and the social relations required to use them” (Wisner et al 1994, p 50).

Firstly, it is argued that in terms of understanding natural disasters, the social production of vulnerability is equally important as understanding and addressing the natural hazards. A natural disaster is always triggered by a natural hazard. But the vulnerability of a nation or a region is what determines whether or not a hazard can evolve into a disaster (Wisner et al 1994, p 49).

The Disaster Pressure and Release Model (PAR) provide the view that every disaster faced by people is a combination of vulnerability and hazard. A natural disaster can never occur if the vulnerability of Jamaica is theoretically non-existent. Vice-versa, the same applies; a very vulnerable society can never experience a disaster if there are no hazards.

The combination of hazards and vulnerability can be simplified by the following equation:

- **Risk (disaster) = Hazard x Vulnerability** (Wisner et al 1994, p 49).



Metaphorically speaking, the model resembles a nutcracker in which people are experiencing multiple pressures, both from their vulnerability and from the impact of the hazard. The only way for individuals to release the pressure is for them to make sure that vulnerability is reduced (Wisner et al 1994, p 50).

Source: “At Risk – second edition”, 2012  
**Figure 1.0 Pressure and Release Model**

The most prominent *root causes* of vulnerability within the model are economic, social and political structures (Wisner et al 1994, p 529). In the case of Jamaica, political corruption highly affects all of these structures which consequently increase vulnerability. Another root cause described in this thesis is the squatter settlements which are another result of the three above mentioned structures (Wisner et al 1994, p 53).

In terms of the *dynamic pressures* they include lack of training, violence and foreign debt. The foreign debt is partly caused by corrupt politicians using aid for personal gain rather than national development. Moreover, violent conflicts occur between criminal gangs and the police, whilst the lack of training is closely related to school dropouts within the socioeconomically disadvantaged squatter settlements (Agnew 1994, p 425).

Lastly, the *unsafe conditions* include people having to live in hazardous locations (such as the squatter settlements) as well as lacking effective protection by the state. The lack of protection can take the forms of unsubsidized insurances which leave the population without easily available property and health coverage (Wisner et al 1994, p 55).

In terms of the progression of vulnerability, Jamaica is a very applicable nation to this model. The island is also exposed to all of the natural hazards described in the model.

## **2.2. General Strain theory**

The General Strain theory (GTS) is another theory used in this thesis as an explanation to the relation between Jamaican squatter settlements (accounts for 20 % of the population), criminal activities (Jamaica had the fourth highest murder rate in the world in 2010) and disaster preparedness.

The original Strain Theory (first developed in 1938) predicts that there is a strong correlation between lower class and delinquency. However, in GTS it is claimed that this correlation is just as common within the middle and upper classes (Agnew 1985, p 152).

Robert Agnew explains that there are three major types of strains within a society: “the failure to achieve positively valued stimuli”, “the removal of positive stimuli” and “the presentation of negative stimuli”.

In terms of positively valued stimuli, there are three sub-divisions, but only one that is relevant to this thesis;

- Money and possessions are according to Agnew a major cause of strain when it is not obtainable through legitimate means. The theory finds that these types of strains are related to criminal activities (Agnew 1994, p 425).

Furthermore, the removal of positive stimuli can manifest itself in the form of a diseased friend or family member or a broken relationship. It could also be the result of the theft of an important object. Agnew argues that in this regard individuals can be deceived into delinquency as they try to seek revenge on those who removed the positive stimuli (Agnew 1992, p 57).

Finally, the presentation of negative stimuli is especially influential to adolescents as they experience conditions such as child abuse, neglect, negative school experiences and homelessness. It is argued that the above-mentioned events can have a major impact on increasing delinquent behavior (Agnew 1992, p 58-59).

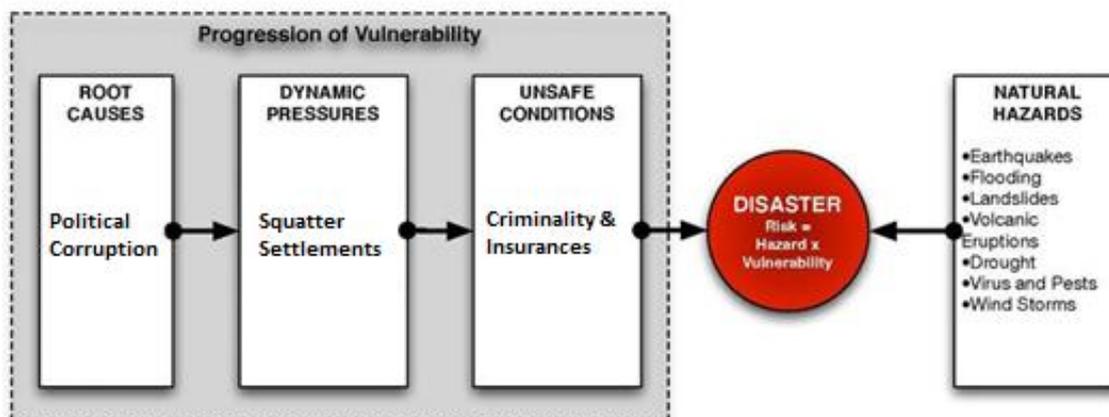
Agnew claims that these strains can be highly criminogenic causing negative effects and more specifically anger, a prime feeling that instigates criminal activity. Individuals become angry as they blame their problems and circumstances on others (Agnew 1992, p 59). Additionally Agnew argues that anger is found to incite a person to lower his or her

inhibitions, put them to action and create a desire for revenge (Agnew 1992, p 60). In conclusion, GTS claims that there is a strong correlation between an increase in strain and an increase in anger. Furthermore, increased anger may lead to an increase in criminal activities as individuals become hostile, aggressive and “high” in negative arousal (Agnew 1992, p 61).

To conclude, youths within marginalized communities are often socioeconomically disadvantaged as they are deprived of school attendance and instead forced into domestic labor. The exclusion from the school system can cause feelings of anger which is highly criminogenic in relation to monetary strains (poverty) (Agnew 1994, p 425). The lack of school attendance also has an impact on disaster preparedness, as schools are instrumental in providing disaster training. If youths within squatter settlements are not obtaining this knowledge through schools, it is highly unlikely that they will obtain it at all. These marginalized communities are “socially excluded” from society, and are therefore not receiving any disaster training as the majority of the small communities in Jamaica (Desmond Hall, 2009).

### 2.3. Analytical Framework

In this thesis, an analytical framework based on the Disaster Pressure and Release Model has been developed and is used throughout the empirical study and analysis. Root causes, dynamic pressures and unsafe conditions are still used as in the PAR but the major difference is that PVJ is specific to the Jamaican context rather than the general notion of vulnerability.



In this model, root causes can be represented by several different factors. However, this framework focuses upon political corruption as the main proxy. Political corruption is a widespread phenomenon that has a strong negative impact on development and vulnerability. Moreover, the dynamic pressures within this framework are represented by Jamaican squatter settlements. These communities are considered major causes of vulnerability because of their fragile and marginalized nature. Ultimately, the unsafe conditions in the analytical framework manifest itself through criminality and insurances. These two variables can have a big impact on vulnerability in the event of a natural disaster and its aftermath.

**Figure 2.0 Progression of Vulnerability in Jamaica**

### 3. Empirical study of Jamaica

This empirical study is based on the analytical framework of PVJ and will thoroughly evaluate the impacts that root causes, dynamic pressures and unsafe conditions have on contemporary Jamaican disaster management and vulnerability.

The structure of this empirical study is as follows:

The purpose of the section of root causes is to explore the ways in which political corruption affect Jamaican disaster management and vulnerability. The main factors that are covered include political corruption, continuous infrastructural congestion and an increased foreign debt. The theory of X-inefficiencies is additionally provided as an instrument of evaluation where the correlation between economic development and levels of corruption are depicted in a Caribbean, and more specifically a Jamaican context.

The second section of dynamic pressures investigates in what ways the Jamaican squatter settlements affect vulnerability. The main focus is on the physical characterization of these communities in forms of living conditions and hazard resilience.

The third section of this thesis focuses upon the unsafe conditions within the analytical framework. Through the General Strain theory, an assessment of the relation between socio-economic deprivation, criminality and school drop outs is provided. Moreover, the relation between insurance coverage and recovery is further addressed in this section. The international insurance pool of CCRIF is depicted and insurances at an individual level in a Jamaican context are evaluated.

Ultimately, the final section of this empirical study includes the progression of vulnerability in Jamaica. Here the root causes, dynamic pressures and unsafe conditions within the analytical framework are analyzed from a Jamaican vulnerability perspective. The most prominent causes of vulnerability are addressed as well as how these factors affect disaster management on the island. Moreover, it is further stated within this paragraph what kind of hazards that Jamaica is particularly prone to.

#### 3.1. Root causes

##### *3.1.1. Corruption and development – the theory of X-inefficiencies<sup>1</sup>*

The American-Ukrainian economist Harvey Leibenstein introduced the theory of X-inefficiencies during the 1960s. This theory suggests that societies with high levels of corruption experience numerous self-imposed inefficiencies in terms of the use of societal resources. This results in a lack of organizational innovation, overall collective non-performance and macroeconomic mismanagement (Collier 2002, p 3-4). Leibenstein explains that systems with large X-inefficiencies are to a higher extent controlled by the “grabbing hand” of the government rather than the “invisible hand” of the market mechanisms as theorized by the neoclassical economic school (Collier 2002, p 4).

The X-inefficiencies create benefits within the socioeconomic system for the governing elite and their allies at the expense of the citizens (Collier 2002, p 4). An example of this

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<sup>1</sup> This theory is not presented within the theoretical framework as it is not relevant to the vulnerability analysis of this thesis, but solely the topic of corruption and development.

phenomenon is the Jamaican Development Infrastructure Programme which is described more profoundly below.

Since the theory of X-inefficiencies is manipulating the existing socioeconomic system, GDP per capita will work as a measurement of societal economic output and development. Collier argues that, *"this supports the proposition that states with high levels of economic X-inefficiencies created by a self-interested governing elite and government bureaucrats will display lower levels of economic growth as measured by GDP per capita"* (Collier 2002, p 4).

In 2011, Jamaica scored 3.3 on the Global Corruption Perception Index (CPI) where 1 is the most corrupt and 10 is the least corrupt. According to Leibenstein's theory of X-inefficiencies, this would result in poor economic development and a low GDP per capita. In 2010, Jamaica's GDP per capita was US\$8 300 which ranks at the very bottom in comparison to the other Caribbean countries. The only Caribbean country that had a lower GDP per capita was Haiti with US\$1 200 (GDP - per capita - Central America & the Caribbean, 2012). Moreover, Haiti scored lower than Jamaica on the CPI which identifies them as more corrupt, and would thus imply that the theory of X-inefficiencies is applicable in this sense.

On the other hand, the case of the Dominican Republic does not entirely fit within the frames of the theory. Their CPI score of 2.6 was lower than that of Jamaica but their GDP per capita was in 2010 slightly higher (US\$8 900) (Corruption Perception Index, 2011).

However, the nations with the highest GDP per capita in the Caribbean, the Bahamas (US\$28 700) and Barbados (US\$21 800) both scored above 7.0 on the CPI which would imply a strong correlation between economic growth and low levels of corruption. Although it is not necessarily the nation with the highest GDP per capita that has the highest score on the CPI, but there is still a definite connection between the two variables (Corruption Perception Index, 2011).

Furthermore, there is one country in the Caribbean that deviates from the pattern. Trinidad and Tobago had in 2010 a GDP per capita of US\$21 200 and a CPI score of 3.2 (Corruption Perception Index, 2011) (GDP - per capita - Central America & the Caribbean, 2012). This is explained by the fact that the economy of Trinidad and Tobago is dominated by petroleum exports and refining local and imported oils (Trinidad and Tobago - Economy, 2012).

Dr. Collier further adds that corruption alone is not the only variable that affects a state's level of development. Key variables such as geography and comparative advantages have a major impact as well. *"It can be assumed that those states with the best resource endowments are the most likely to develop faster"* (Collier 2002, p 6). The feature of comparative advantages is not included in the theory of X-inefficiencies, which explains the lack of correlation in the case of Trinidad and Tobago, as their economic development is built up around their petroleum advantages. Leibenstein's theory proves to be generally applicable to the Caribbean countries as it highlights the correlation between corruption and economic development.

### **3.1.2. Corruption in Jamaica**

Jamaica has a history of corruption and is still today struggling with it in numerous of institutions. As previously mentioned, Jamaica scored 3.3 on the CPI in 2012 which gave a country ranking of 87 out of 178. However, in 2011 the score of the CPI was identical to 2010

except from the fact that the country ranking had declined slightly from 87 to 86. During the past 10 years, Jamaica has never scored higher than 4.0 on the CPI scale, which defines corruption as a continuous problem (Jamaica still perceived as corrupt, 2011).

These statistics of the last decade imply that corruption in Jamaica is not fought efficiently enough. The Contractor General Greg Christie who is the independent, anti-corruption Commission of Parliament could not emphasize enough the influence that the Jamaican people can have in this matter.

*“It should now be abundantly clear to all Jamaicans that unless they demand monumental changes in the country’s existing moral, ethical and legal anti-corruption codes, and in its approach to the conjoint issues of transparency, accountability and good governance in the administration of the affairs of the Jamaican state, 10 years from now we will still be at the same place, talking about the same things”* - Contractor General Greg Christie (Jamaica still perceived as corrupt, 2011).

### **3.1.3. Infrastructure and economic development**

In 1994 the World Bank articulated through the World Development Report the direct links of infrastructure to poverty. Infrastructure is a welfare phenomenon that supplies the population with basic sanitation, electricity and clean water supplies, which are all measures of poverty.

The consultant Paul K. Freeman argues that infrastructure is a key component of economic growth and the loss of infrastructure through natural disasters may lead to significant indirect and secondary costs for the poor population (Freeman 2000, p 3). This view is reinforced by the systems engineer Damon P. Coppola, who claims that the consequences of infrastructure damages may include the loss of vital services, injury, death, property damage or even a combination of these (Coppola 2011, p 101).

Infrastructure is essential to economic development in developing countries which the World Bank conducted a study on in 1994. Infrastructural development (within developing countries) for agricultural development was associated with an approximate 30 % increase in income in the average rural household, a 24 % increase in income from crops, a 92 % increase in income from wages and also a 78 % increase in income from livestock and fisheries. Since Jamaica’s economy currently depends on agricultural production, the importance of a well functioning and disaster mitigating infrastructural network is fundamental to development (World Bank 1994).

Infrastructure hazards as Coppola described them are hard to define in terms of costs. There has generally been too little work conducted on the secondary impacts of natural disasters in developing countries since they are difficult to measure. However, the Japanese-American professor Masanobu Shinozuka conducted studies that indicated that the loss of flows from infrastructure, damages societies of up to 250 % of the direct costs of the disaster (Shinozuka, 1998).

### **3.1.4. The Jamaican Development Infrastructure Programme**

Political corruption in terms of disaster preparedness and mitigation, is a major concern, especially with the following case in mind:

In February 2010 the Jamaican Government implemented the Jamaica Development Infrastructure Programme (JDIP,) which should improve the infrastructural network of the island in order to enhance the quality of life and stimulate economic development. This should be done by building bridges, efficient drains and traffic systems. The program was undertaken over a period of five years, terminating in February 2015, and the agency in charge of the entire project would be the National Works Agency (NWA), which is the Executive Agency under the Ministry of Transport and Works (Jamaica Development Infrastructure Programme, 2007).

The JDIP was funded by the Government of China through the Bank of China and the sum of the loan was estimated to approximately US\$400 million.

This economic programme that intended to modernize the Jamaican infrastructure is a well-needed addition. The road network of Jamaica today is highly congested due to an increasing number of licensed vehicles. Major highway development projects have been implemented in the past (e.g. the highway project between Montego Bay and Negril in 1999) but because of financial difficulties they have been suspended (Jamaica - Infrastructure, power, and communications, 2012).

Furthermore, Powell points out that the drainage systems of the island are insufficient. She explains that it only takes a couple of hours of rainfall to create flooding conditions in the most vulnerable parts of Jamaica (Interview with Powell 2012-02-15). By expanding and making the drains more efficient, longer periods of rainfall will be better maintained.

However, in 2011 it was revealed that approximately J\$102 million dollars (US\$1.2 million) earmarked for infrastructural development through the JDIP had been used to refurbish the corporate offices of the NWA. This called for investigations and probing which further caused the nations infrastructural development to stagnate (Erica Virtue, 2011).

### ***3.1.5. Natural disasters, corruption and indebtedness***

The losses of critical infrastructure in developing countries due to disasters have impacted the international lending institutions. The outcome of this was that the World Bank has loaned approximately US\$14 billion to developing countries during the 1980's and 90's for infrastructural repairs. In 1992, nearly 20 % of all of the loans granted by the Asian Development Bank (ADB) were aimed at rehabilitative assistance from natural disasters (Freeman 2000, p 4).

These types of loans from international institutions are fundamental to the recovery process of developing countries affected by natural disasters. In the case of Haiti 2010, the direct financial cost of the earthquake was estimated to between US\$8.1 and US\$13.9 billion which equates to up to 200 % of the country's total GDP in 2008 (Haiti quake damage could cost \$14B US, 2010).

Economic setbacks from disaster related damages of that magnitude causes nations to heavily rely on foreign aid. Furthermore, developing countries that already are profoundly in debt can enter a vicious circle of economic distress where the financial burden is too high and the future investment to mitigate the loans is insufficient (Heather Stewart, 2010).

The United Nations Conference on Trade and Development (UNCTAD) has analyzed the impact of 21 natural disasters between 1980 and 2008 on developing countries heavily in debt. The result of the study showed that the cost of rebuilding the damages of disasters leaves long-term financial scars. On average, a natural disaster causes a 24 % increase in a country's debt-to-GDP ratio, which is a widely used measurement of indebtedness (World Bank 1994).

Furthermore, Coppola argues that corruption can contribute additionally to the vicious circle of economic distress. He claims that if government executives are misusing loans from international institutions it will result in underdevelopment coupled with high indebtedness (Coppola 2011, p 648-649).

This misuse of loans, in the case of JDIP earmarked for infrastructural improvements, together with the fact that Jamaica in 2010 had the fourth highest debt as a percentage of GDP in the world, makes them a prime example of the economic distress previously described (Danielle Kurtzleben, 2011).

Paulo Mauro from the International Monetary Fund (IMF) claims that corruption negatively impacts investment levels as corruption increases the risk of the investors. Empirical studies show a strong correlation between corruption and foreign direct investment levels (Collier 2002, p 4). Foreign corporations and governments become uncertain of whether or not their investments will prove to be valuable, thus causing hesitation.

Political corruption in relation to the massive indebtedness will highly affect Jamaica's ability to recover from future natural disasters.

### **3.1.6. Conclusions – Root causes**

The above review shows that:

- ✓ Jamaica is per definition a corrupt nation and it is noted through statistics that the levels of corruption were basically unchanged between 2010 and 2011.
- ✓ The impact of political corruption on the JDIP further contributes to increasing Jamaica's foreign debt and sustaining the congestion of the infrastructural network.
- ✓ According to the theory of X-inefficiencies there is a strong correlation between economic development and levels of corruption that is applicable to most of the Caribbean countries (Trinidad & Tobago is an exception)
- ✓ Infrastructural networks have a major impact on a nation's economy.
- ✓ Extensive foreign debt can cause nations to enter a vicious circle of economic distress and negatively affect the recovery in the aftermath of a disaster.

## **3.2. Dynamic Pressures**

### **3.2.1. Squatters and the lack of revenues**

A potential explanation to the underdevelopment of Jamaica is the lack of revenues that the state obtains through taxation. This deficit can be partly explained by the problem of squatters, or "illegal or unauthorized occupation of land or housing" as it is defined (National Squatter Survey 2004, p 12). The 754 squatter settlements all around the island represent approximately 20 % of the total Jamaican population (National Squatter Survey 2004, p 25).

*"We are losing millions of dollars in property taxes as between legitimate and illegitimate householders; the compliance rate is only 45 per cent."* - Charles Sinclair, Montego Bay's mayor (Adrian Frater, 2011).

In 2010, St. James Parish Council provided figures that showed that US\$2.6 million was collected through property taxes. As Charles Sinclair states, this number was only 45 % of what the actual number should look like. The uncollected property taxes for 2010 were therefore amounted to US\$3.3 million in St. James Parish (Adrian Frater, 2011).

The Organizations for Economic Co-operation and Development (OECD) stated through the World Bank that the *"illicit flows of cash from developing economies amount to between \$500-\$800 billion a year. How much of this is in the form of tax evasion is unclear, but it is not unreasonable to estimate that the lost revenue is equivalent to many times global bilateral development aid and more than the national income of several poor countries combined."* (Jeffrey Owens, 2009).

Tax revenues of this magnitude can be used for healthcare, education and infrastructure in developing countries; improvements that would have saved lives. Taxes also have a key role in strengthening and *"building up institutions, markets and democracy by making the state accountable to its taxpayers."* (Jeffrey Owens, 2009). OECD states that a lack of tax revenues is causing governments to become increasingly reliant on aid and foreign loans.

As this thesis has already grasped, the debt situation in Jamaica today is highly unsustainable. During the last financial crisis, Jamaica's debt increased by a third and now stands at more than US\$2 905 per person. The Jamaican government spends approximately US\$387 per citizen a year in debt repayment; this number equals more than the amount spent on education (US\$209) and healthcare (US\$97) combined (Jubilee Debt Campaign - Jamaica, 2011).

In 2010, the lack of state revenues caused the Jamaican government to take a US\$200 million loan from the World Bank for fiscal and debt sustainability. The loan aimed to support a series of measures to *"enhance fiscal and debt sustainability, increase the efficiency of public financial management and budgeting processes, and increase tax revenues through improved tax administration"*. The last point of the programmatic policy loan targeted the problem of lacking tax revenues due to squatting, for example (Stevan Jackson, 2010).

The Jubilee Debt Campaign (JDC) wrote on their website that *"Jamaica has never been considered for debt cancellation because it is not poor enough"*. However, the United Kingdom, the state that Jamaica is most indebted to, has written off some debt in recent time. For instance, the UK did write off US\$3.8 million of Jamaica's debt for the fiscal year 2010-11 in order to promote efficiency of the public sector and increase economic growth (Jamaica gets J\$327m Debt Relief from UK, 2011).

### **3.2.2. Squatters and development**

As mentioned, there exist 754 squatter settlements in Jamaica (approximately 500 000 individuals). However, this is not a new problem; studies show that that 66 % of the settlements have been in existence for more than twenty years (National Squatter Survey 2004, p 22). Of these settlements surveyed, 62 % are located in rural areas against the 35 %

located within urban regions (National Squatter Survey 2004, p 24). These statistics confirms that the urbanization currently taking place in Jamaica is not of a rapid nature, as the number of rural squatter residents is twice as high as that of the urban communities.

However, it should be noted that not all indirect settlements are poor. Some houses of higher standards in Jamaica are simply built without a building permit which controversially enough falls under the same category as squatter settlements (Interview with Powell 2012-02-15).

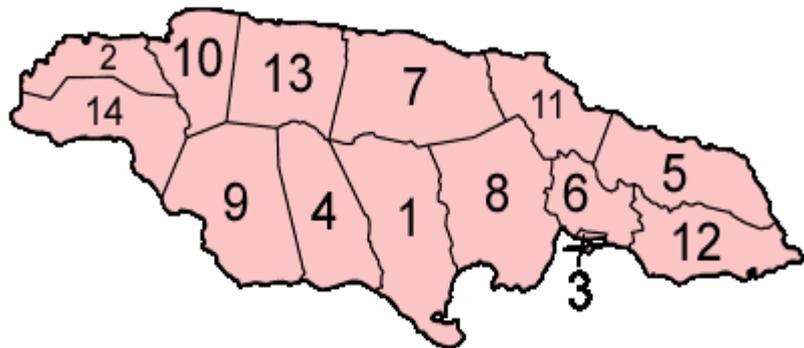
The physical characteristics of indirect settlements usually include infrastructure and services below adequate conditions. Only 36 % percent of the settlements in Jamaica are located near a paved road.

The Jamaican Forest

Department conducted a

study in 2008 which revealed that there are 1,336 existing agricultural squatter households that are cultivating forest reserves

(National Squatter Survey 2004, p appendix IV). These are mainly located within the parishes of Portland (5) and Clarendon (1) (see figure 3.0). This is problematic in terms of regional economic development. As mentioned earlier, the study conducted by the World Bank in 1994 showed that adequate infrastructure increases the income from agriculture (approximate a 30 % increase in income per average household)(World Bank 1994). If the infrastructure was adequate to all communities, squatter settlements would be able to benefit from it and have brighter prospects of improving their financial situation.



Source: mapsof.net, 2012

**Figure 3.0 Jamaica Parishes Numbered**

### **3.2.3. Squatters and vulnerability in Jamaica**

A Jamaican report on squatter settlements determined that these communities are among the most severely impacted during natural hazards. The most prominent reasons for this are the location of the settlements and also due to the construction materials of the facilities. The majority of the buildings are predominately constructed from a combination of board and concrete, which are not as hazard resilient as concrete buildings (National Squatter Survey 2004, p 49). The bulk of the population within these settlements is also unskilled which means that the knowledge of building hazard resilient facilities is lacking (National Squatter Survey 2004, p 38).

Mr. Ramesh Kumar, and Indian social reformer, argues that *“these settlements are unofficial and so, without any legal tenure, the people living there are not entitled to get connections to basic facilities like water and sanitation”* (Ramesh Kumar, 2011).

In terms of the access to potable water within these Jamaican communities, studies indicate that it is no different than the remaining part of the island, except for a few cases. 85 % of the indirect settlements surveyed had access to water sources established by the National Water Commission (NWC). This would indicate that the majority of the squatter communities in Jamaica are located near the national water supply network, as well as the fact that these settlements in comparison to their Indian equivalents are fairly small since

the water resources are sufficient to the majority of its inhabitants (National Squatter Survey 2004, p 32).

However, the settlements that do not have frequent access to the water supply network are considerably more vulnerable. The Environmental Protection Agency (EPA) has estimated that approximately 90 % of the world's fresh water is contaminated and unsuitable for drinking without going through some process of purification. Furthermore the Centers for Disease Control and Prevention (CDC) estimate that *"88 % of the world's cases of diarrhea are the result of unsafe water, inadequate sanitation, and poor hygiene."* (Bradley 2011, p 69).

In order to gain perspective of how deadly unsanitary conditions are it is said that *"water-related illnesses rank as one of our planet's deadliest killers, resulting in the death of 1.5 million people annually, most of them children"* (Bradley 2011, p 69).

In the case of a disaster and more specifically flooding, Powell argues that Jamaica can be exposed to four different diseases. These are as described; typhoid fever, cholera, hepatitis A and dengue fever. The latter falls under the category of vector-borne diseases (diseases transmitted by organisms carrying pathogens from one host to another). Flooding conditions are very favorable to breeding mosquitoes, which can result in a potential outbreak of dengue fever. These water-borne diseases mentioned by Powell, including malaria, are all flagged by the World Health Organization (WHO) as secondary hazards in relation to natural disasters (Lee Jong-Wook, 2004). With respect to malaria, Jamaica is a non-endemic country which makes the risk of an outbreak low (Malaria in Jamaica, 2007).

In order to face the crisis, the United Nations (UN) implemented the Millennium Development Goals (MDGs) to reduce poverty and ensure sustainable development. One of the goals was to *"Halve, by 2015, the proportion of people without sustainable access to safe water and basic sanitation"* (Water Supply and Sanitation, 2010). The current progress of achieving the goal is however uncertain;

*"With the exception of sub-Saharan Africa, the world is well on its way to meeting the drinking water target by 2015, but progress in sanitation is stalled in many developing regions."* – World Health Organization (Malaria in Jamaica, 2007).

#### **3.2.4. Squatters and natural hazards in Jamaica**

In Jamaica it is shown that squatter settlements are particularly vulnerable to flooding, landslides and storm surges in terms of natural hazards. Communities located at the banks of gullies or channels of rivers are at constant risk of being affected by flooding and storm surges (National Squatter Survey 2004, p 50). Approximately 25 % of all the mapped National Squatter Survey 2004 is located within 100m of a waterway. This in return does not only severely impact the people living there but also has a critical impact on the watersheds if the informal settlers use *"indiscriminate practices"*. This can take the form of poor or non-existing waste management that can contaminate the islands waterways (National Squatter Survey 2004, p 45-46).

In terms of the landslides, the only indirect settlements that are affected are located within the parishes of St. Andrew and St. Mary (number 6 and number 11 in figure 2.0, respectively). These regions are characterized by mountains and steep slopes which create

ideal conditions for ground movements triggering landslides (National Squatter Survey 2004, p 50).

### **3.2.5. Conclusions – Dynamic pressures**

The above review shows that:

- ✓ The lack of revenues that the Jamaican state obtains every year is insufficient. This can be explained by the fact that 20 % of the population is made up of illegal occupants and thus do not pay taxes.
- ✓ The lack of revenues is causing Jamaica to rely on foreign aid in terms of national development – further contributing to an increased foreign debt.
- ✓ There are 754 existing squatter settlements in Jamaica accounting for approximately 500 000 individuals.
- ✓ The vulnerability within these settlements is high as many facilities are constructed using non-resilient materials. Unsanitary conditions further expose these individuals to diseases.

## **3.3. Unsafe Conditions**

### **3.3.1. Disaster preparedness and delinquency**

A vast amount of resources are spent on crime preventative activities every year, resources that could improve national disaster preparedness immensely. In 2010, Jamaica had the fourth highest murder rate in the world with 52.1 murders committed per 100 000 citizens (Top Ten Countries with Highest Murder Rates, 2010). The same year, Jamaican government officials arranged meetings with donor countries and “international lending institutions such as the World Bank and the American Development Bank (IDB)” regarding a US\$1 Billion loan to fight crimes, which further increased Jamaica's foreign debt (Jamaica seeks US\$1 billion to fight gangs, 2010).

Moreover, squatter settlements are havens for crimes. The criminal activities within these settlements, as argued by Agnew in the theoretical framework, can be explained through the General Strain theory.

The Master's student in Development Studies, Olivera Bogicevic, argues that the reason for individuals to settle within squatting communities is purely financial (Interview with Bogicevic 2012-04-14). The generalization is thus that these settlements are poor and that the population suffers from monetary strain, meaning that it is hard for them to obtain a sufficient income through legitimate means. This is, according to the GTS, an explanation for the criminal activities. However, as Agnew further argues that there is a relationship between crimes and the removal of positive stimuli, a vicious circle is created. Monetary strains are causing individuals to steal in order to survive. In return, the people that are affected by theft may seek revenge on those who removed the positive stimuli (Agnew 1992, p 57).

Furthermore, the European Journal of Criminology contributes to the GTS by testing a school contextual version of the theory. It is argued that families living within marginalized or socioeconomically disadvantaged communities “*might be less likely to stimulate their*

*children to engage in the social competencies and ambitions that are essential to be successful at school”* (Op de Beeck et al 2012, p 54).

In these conditions, adolescents might achieve bad academic results, causing them to be less motivated in participating in the school system. As a result, these disadvantaged youths are more likely to drop out of school than other students (Op de Beeck et al 2012, p 54).

Desmond Hall, lecturer at the University of the West Indies argues that with respect to Jamaican squatting communities, educational opportunities are very limited. The main reason for this is that these settlements are generally located inconveniently far away from schools and sufficient infrastructure. Furthermore, in many of these communities, education is not a priority at all as children are used for domestic work (Hall, 2009).

Mr. Hall adds that the socioeconomic strains within the squatter settlements are causing numerous school dropouts, with many children not going beyond the elementary level (Hall, 2009). These negative interactions with the school system among youths may create strong feelings of injustice, anger and inequality and lead to delinquency.

Consequently, these negative encounters with the school system are also problematic in terms of disaster preparedness.

In 2008, former prime minister of Jamaica, Bruce Golding, announced that 150 000 students in high schools all over the island would be trained in order to respond properly in the event of a disaster and its aftermath. The training programme was funded through the US\$10 million emergency recover loan implemented after the destruction of Hurricane Dean in 2007 (150,000 to be trained for disaster preparedness, 2008).

*“We can prevent, substantially, the damage that is done when these disasters come, and that is why we put so much effort into mitigation, into sensitization, into training, into alerting people.”* - Bruce Golding (150,000 to be trained for disaster preparedness, 2008).

The schools are essential as means of communication in terms of disaster preparedness and mitigation. Students who take part in disaster drills during school time will learn how to act spontaneously in the case of an earthquake, and will hopefully even pass the knowledge on to their families. However, within squatter settlements this kind of expertise is harder to obtain as many of the children do not go to school, and the communities are not receiving this information as they are illegal occupants and therefore excluded from the rest of society (Kamrava 1993, p 87).

### **3.3.2. The lack of insurance in developing countries**

To manage the exposed and harmful lifestyle within the squatter settlements, families have to resort to emergency measures such as child labor as well as the reduction of children’s education and family healthcare. The constant fear of losing assets through natural hazards or crimes can even cause families to sacrifice profitable business opportunities and technologies, opportunities that could potentially break their cycle of poverty. Individuals within these communities have adapted to low-risk and low-return strategies because of the monetary struggles, which reduces the growth focused opportunities taken (Patel 2002, p 7).

Sabbir Patel, a development professional, argues that it is of critical importance that the poorer population is protected from these kinds of risks if not to directly alleviate poverty

but at least to give them the opportunity to benefit from measures such as education, gender equality, sanitation, employment opportunities, population control and healthcare (Patel 2002, p 7).

Patel further argues that the best way to protect the population and specifically the poor population from unpredictable events, such as natural hazards is through insurance (Patel 2002, p 11). Insurances contribute to a decline in economic insecurity as the property and lives of individuals are “looked after” (Linnerooth-Bayer et al 2008, p 4).

As discussed earlier in this thesis, over 90 % of natural disaster related deaths occurred in developing countries between 1980 and 2004. The annual direct economic losses were on average US\$54 billion. However, apart from the human and economic burden, the insurance cover also differs a lot between the developed and the developing world. In developed countries during the same period, approximately 30% of the losses were insured (3.7 % of the GNP). In contrast, only 1 % of the losses through natural hazards and disasters were insured in the developing world (totaling of 12.9% of the GNP) (Linnerooth-Bayer et al 2008, p 3)

It seems legitimate to claim that the need for insurance is high within the developing world. *“In 1998 the three largest insurance markets (USA, Japan and the UK) covered almost 64 % of the total world insurance market but only 8 % of the world population. By 2000 this had grown to almost 69 %.”* (Patel 2002, p 11). Patel argues that formal insurance is not made available where it is needed the most, where human well-being is at the lowest and vulnerability at its highest, thus, as previously claimed, in developing countries (Patel 2002, p 11).

The United Nations International Strategy for Disaster Reduction (UNISDR) claims that the impact of natural hazards and climate extremes on economic well-being and human suffering has increased worldwide at an alarming rate during the past decades.

*“More than three-quarters of recent losses can be attributed to windstorms, floods, droughts and other climate-related hazards.”* (Linnerooth-Bayer et al 2008, p 3).

Since many of the developing countries are situated along the world’s hazard belts and are continuously affected by floods, cyclones, droughts and earthquakes, insurance will be of even greater importance in the near future due to climate change and its consequences.

### **3.3.3. National insurance in Jamaica**

In terms of natural disasters, Jamaica is one of the members of the Caribbean Catastrophe Risk Insurance Facility (CCRIF), which is an entity that addresses the need of insurance against these events. The small island states within the Caribbean are struggling with short-term liquidity in the aftermath of disasters, as their economic resilience is limited due to the high levels of indebtedness (Caribbean Catastrophe Risk Insurance Facility, 2011).

*“Based on historical financial data gathered since 1970, adverse natural events are responsible on average for losses equivalent to more than two per cent of the Caribbean region’s annual gross domestic product (GDP).”* – The World Bank (Caribbean Catastrophe Risk Insurance Facility, 2011).

However, this is a long-term average calculated during over 40 years. Single natural disasters and hazards as e.g. hurricanes or earthquakes can result in major financial and humanitarian losses over night.

The CCRIF is the result of over two years of collaboration between the governments of the Caribbean as well as key donor partners and a team of experts working for the World Bank. The Caribbean governments can purchase coverage through the CCRIF similar to business interruption insurance, which means an insurance that covers the loss of income and expenditures suffered in the aftermath of a disaster. This insurance is tailored to fit each and every member state of the CCRIF, which significantly lowers the cost in comparison to other similar insurances (Caribbean Catastrophe Risk Insurance Facility, 2011).

The CCRIF is constructed as a collective emergency reserve that combines funds into a common pool available to all the member states. This is a more economical solution as the *“sum of country-specific reserves would be much larger than the actual needs of the pooled countries in a given year.”* (Caribbean Catastrophe Risk Insurance Facility, 2011).

*“Considering that on average, a hurricane or an earthquake only affects one to three Caribbean countries in any given year, a pool holding only the reserves for three potential payouts should be sufficient for the entire group of countries participating in the pool. Each year as the pool is depleted; participating countries would replenish it in proportion to their probable use of the funds in the pool.”* – The World Bank (Caribbean Catastrophe Risk Insurance Facility, 2011).

The CCRIF is an efficient risk-financing system that makes this kind of insurance available to its member states at approximately half the price of approaching the reinsurance industry on their own. This is especially favorable as most of the Caribbean states suffer from high debts, highly limiting their ability to access credit in the case of a disaster (Caribbean Catastrophe Risk Insurance Facility, 2011).

However, this multi-country catastrophe fund has had its share of criticism. In 2008, the Caribbean was struck by the two category five hurricanes of Dean and Felix. These tropical storms caused severe damage in a number of different member states. But as the wind speeds of the Hurricanes were not “sufficient to reach the parametric triggers”, no financial compensation was granted (Scott Vincent, 2008). Even wind speeds under the parametric triggers can be devastating as many Caribbean nations including Jamaica have a big number of fragile facilities. A renegotiation of the terms for liquidity payouts would thus be of importance.

### **3.3.4. Individual insurances and hazard mitigating equipment in Jamaica**

However, there is a distinct difference between insurance at a national level in comparison to the individual level. In a study conducted on insurance at the Manchester Parish Council in Jamaica, it is shown to what extent health and property insurance are purchased. The study can be regarded as an instrument that highlights the risk awareness of a group of Jamaicans.

The 19 individuals that took part in the survey were regarded as middle-income takers and had a monthly income estimated to between US\$691 and US\$1 037 (Interview with Powell 2012-02-15).

Of all the individuals surveyed at the Manchester Parish council, approximately 90 % had purchased health insurance out of their own pocket. This is a significant number as it implies that the majority of the staff was insured (Survey – Insurance coverage and fire extinguishers, 2012). The high percentage is explained by the fact that *“the government subsidizes health insurance for government workers by 80 %, and other private companies by law are to do the same”* (Interview with Powell 2012-02-15).

Different kind of property coverage is considered one of the best ways to protect one’s property against the direct financial costs of natural hazards and disasters. But in terms of home insurance purchased, the number is significantly smaller than that of health insurance. Property coverage is not subsidized by the Jamaican government which makes them expensive even for the middle-income takers. Only approximately 26 % of the middle-income takers at the council own a home insurance (Survey: Insurance coverage and fire extinguishers, 2012).

Powell claims that *“the property insurance and other hazard prevention or mitigation equipment are really cumbersome and expensive, so Jamaicans usually opt to take risks.”* (Interview with Powell 2012-02-15). In terms of these risks, it is further argued that *“Jamaicans have a reactive culture which means that they will not respond unless a disaster or major hazard occurs.”* (Interview with Powell 2012-02-15). This in return might cause insurances to seem excessive.

Another explanation to the lack of home insurance is that *“Jamaicans are such a religious group. We tend to have a lot of faith in God and pray that calamity won’t meet us/our homes/property.”* (Powell 2012).

Jamaica is defined as one of the most religious nations in the world (Marcia Davidson, 2003). Religiosity is thus highly influential and can provide individuals with a “false” sense of security that undermines the importance of insurance coverage.

Furthermore, the Jamaican government also overlooks the importance of subsidized fire extinguishers, which is an obvious sign of risk unawareness. Arthur T. Bradley argues that it is crucial to equip your home with fire extinguishers. The National Fire Protection Association (NFPA) recommends that there should be kept at least one primary extinguisher on every level of your home. The need for fire extinguishers is essential in cases of natural hazards and disasters when the risk of secondary hazards in forms of fire breakouts is apparent (Bradley 2011, p 113). Secondary hazards generally have tendencies of being just as destructive as or even more destructive than primary hazard in terms of death toll and financial costs (Coppola 2011, p 50).

The fire fighter Gabriel Abdellah argues that a fire extinguisher in itself does not prevent fires from occurring. However, a fire extinguisher in combination with adequate knowledge can easily limit a fire to just a piece of furniture, for example, rather than the entire facility (Interview with Abdellah 2012-04-21).

Statistics regarding the ownership of fire extinguishers at the parish council show that the importance of hazard mitigating equipment is undermined. Of all the respondents participating in the survey, not one owned a fire extinguisher. The most common excuses were the lack of governmental subsidizes and the lack of knowledge (Survey: Insurance

coverage and fire extinguishers, 2012). It is not uncommon that a fire extinguisher can be as expensive as US\$230 (Interview with Powell 2012-02-23).

Sabbir Patel conveys that corrupt central governments in developing countries are often unwilling and unable to finance and manage services for its population. These services can be in forms of social services that benefit the poor as well as subsidized insurance and fundamental mitigation equipment (Patel 2002, p 5).

Furthermore, this unwillingness to aid the poor population occurred e.g. in Nicaragua after the big earthquake in 1972. Official corruption has been known to prevent aid from reaching the poor population and especially the urban communities, causing additional deaths (Zoltan Grossman, 2005).

### **3.3.5. Social trust and insurance**

A potential explanation for the lack of property insurances in Jamaica, if the cost is overlooked, could be the lack of social trust.

Olivera Bogicevic argues that there is an obvious lack of social trust within the Jamaican society. *“Jamaicans and more specifically the poor communities generally don’t trust one another and they absolutely do not trust the government. This is mainly because of the fact that the state isn’t doing anything to improve the situation of these exposed settlements.”* (Interview with Bogicevic 2012-04-14).

Powell further adds to the discussion by claiming that Jamaicans do not trust the government. *“We have a notion that most politicians are fake as they are just in it to seek out what they can and not so much for the holistic development of Jamaicans and by extension, Jamaica”* (Interview with Powell 2012-02-23).

This perception of the state and corporations as being evil originates from the awareness that the development of the nation is stagnating even though the population is paying high amounts of taxes (Interview with Bogicevic 2012-04-14). Examples of the stagnation of development in Jamaica is, as mentioned earlier, the failure of the JDIP programme to improve the infrastructural network as well as the lack of resources within the public health system (Medicine In Action, 2011).

Jerker Albin, head of Risk Consulting at Willis, argues that the lack of adequate coverage can be a major contributor to increased poverty both within the developed as well as the developing world. The lack of communication and information regarding insurances is problematic as people can be misled to believe that they are fully covered against events such as floods, when in reality they are not (Interview with Albin 2012-04-28).

Albin further adds that social trust is an essential feature of the insurance industry as individuals and companies rely on insurance carriers to provide the right coverage (Interview with Albin 2012-04-28). In the Jamaican society where social trust is low, this creates problems as individuals don’t purchase insurance coverage since they do not believe that they will get value for the money they invest (Interview with Bogicevic 2012-04-14).

In addition, there is another pitfall in relation to insurances. Coppola argues that insurance encourages people to act more irresponsibly than they would without coverage. “For

instance, if a person *knows that his furniture is likely to be replaced if it is damaged in a flood, he is less likely to move that furniture out of harm's way (such as moving it to a second floor of his home) during the warning phase of the disaster.*" (Coppola 2011, p 235). This act increases the damage payouts in the aftermath of a disaster, which in return increase the costs of premiums (Coppola 2011, p 235).

### **3.3.6. Insurance and poverty traps**

It is argued that a household's way of coping with a disaster is highly correlated with their access to markets and other institutions. A household with financial market access is able to borrow money in order to maintain their income and sustain their consumption without depleting their assets. Insurance arrangements can play the same role, but rather than borrowing money, the household is compensated for their loss. A final coping strategy is to redirect or increase work time. However, this strategy depends on the access to and depth of the labor markets (Carter et al 2007).

In contrast, households without access to markets and insurance arrangements have to adapt to low-risk and low-return strategies by decreasing their assets and reducing their consumption. In the event of a disaster, prices on assets such as cattle will be relative to the price of food and necessities. If every household in a region responds to an earthquake by selling cattle, the price of cattle would ultimately be much lower than usual which would decapitalize the region (Carter et al 2007).

A household with access to capital via markets or informal arrangements can borrow money against future earnings and thereby immediately rebuild and maintain the asset stocks. Households of this character are expected to fully recover much faster than one without this kind of access.

There are multiple reasons to why "less" well-positioned households recover at a slower pace than the ones located with closer access to markets and financial institutions. However, the World Bank suggests that there are even worse complications of natural disasters than just slow recovery. These complications can take the forms of poverty traps which are defined as a "*minimum asset threshold below which it is not possible to engineer successful asset accumulation.*" (Carter et al 2007).

Households that are pushed below this threshold and into poverty traps would not only experience a much slower post-shock growth than the more fortunate households, but they would also remain at a lower level of development at a permanent level (Carter et al 2007).

Furthermore, the insurance broker, Tommy Ohlsson, believes that; "*individuals don't realize that a disaster can affect them too. The neglect of this risk in relation to monetary strains means that poor people simply don't buy insurances. Insurances must always be put in relevance to food and shelter as they are primary needs to human survival, but it's ultimately up to the individuals to prioritize it in order to ensure the future of their household.*" (Interview with Ohlsson 2012-04-28).

### **3.3.7. Micro-insurance and poor communities**

As argued in this thesis, the importance of insurance in regions vulnerable to natural hazards is self-evident:

*“Without an insurance culture, or support from family or the government, disasters can lead to a worsening of poverty as victims take out high-interest loans (or default on existing loans), sell assets and livestock, or engage in low-risk, low-yield farming to lessen exposure to extreme events.”* (Linnerooth-Bayer et al 2008).

However, households and businesses in poor communities usually cannot afford commercial insurances even with subsidizations. A potential solution to the issue of monetary strain can be micro-insurance programs.

Micro insurance products are tailored to favor low-income rural residents who live on less than US\$2 a day. These insurances generally provide coverage against everything from life and health care to weather, property, agriculture, livestock and disasters. Micro-insurance does not aim at insuring the poorest of the poor, but rather the poor who have something to lose. *“They have an income but are hovering around the poverty line, so that if their crop fails, they get sick or their shop burns down, they have to start from zero again”* (Micro Insurance: A Safety Net With Too Many Holes?, 2012).

Development experts argue that these insurance programs are an essential security net in order to avoid poverty traps. People work their way out of poverty using micro lending for example. By having an additional micro-insurance they can prevent themselves from falling back.

As previously illustrated, social trust is fundamental to policyholders but especially in the case of micro-insurance. Within these programs, policyholders trust the insurance industry with their precarious income and can only hope that the providers keep their promise in terms of payments according to the contracts. This barrier can be a huge problem in developing countries where social trust is particularly low, i.e. in Jamaica.

Moreover, a big criticism against micro-insurance is that most of these products in fact are not tailored to fit the poor population. They do not reflect local risks, which can vary tremendously depending on where you live. *“An insurer can’t just offer what they always do but at a reduced price. A product really has to be redesigned after assessing what the local needs are, and it has to be accessible.”* (Micro Insurance: A Safety Net With Too Many Holes?, 2012).

Another major concern is that the people who would most likely benefit the most from this kind of coverage, the squatters, will be struggling to obtain property insurance as they per se do not own their own land but are instead illegal occupants. However, as many of the micro-insurance schemes provide life and health coverage, these are available to all individuals.

Micro-insurance has not established itself on the Jamaican market yet, but in Haiti it is a fully functioning business. One of the largest microfinance institutions in Haiti, Fonkoze, is providing micro-insurance coverage against disasters and natural hazards to its 50 000 clients, with support from the Micro-insurance Catastrophe Risk Organization (MiCRO) (Alex Bernhardt, 2011). The successful establishment of micro-insurance institutions in Haiti would imply that Jamaica is next in line.

### **3.4.8. Conclusions – Unsafe conditions**

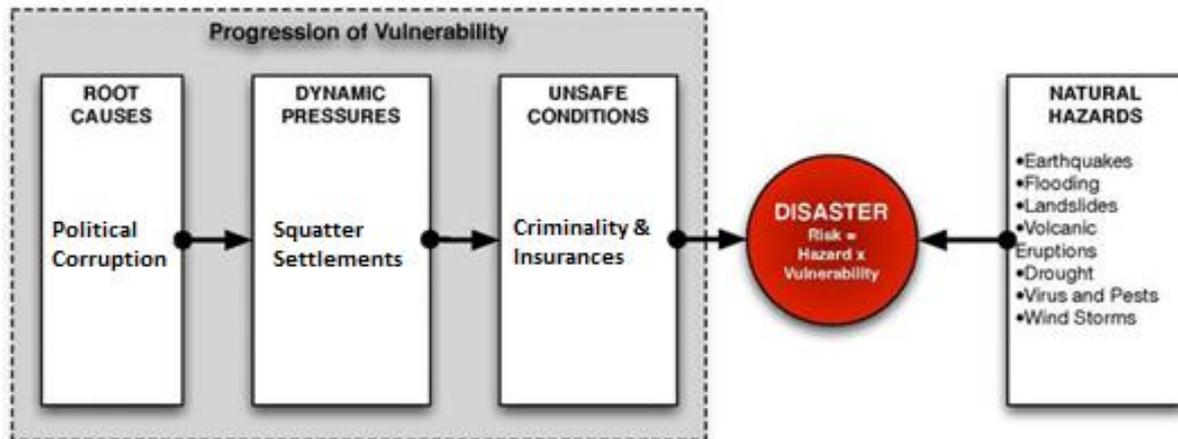
The above review shows that:

- ✓ In 2010, Jamaica had the world's fourth highest murder rate.
- ✓ Crimes are especially common within marginalized communities and the squatter settlements on the island are referred to as "havens for crimes".
- ✓ The socio-economic deprivation within these settlements is closely related to both school dropouts and delinquency, according to the GTS.
- ✓ In terms of the school dropouts, they are problematic as schools are important instruments to communicate disaster training. If youths drop out of school, they will not obtain this knowledge as easily.
- ✓ The need for insurance coverage among poor individuals is essential, as they often do not have the financial resources to recover in the event of a disaster.
- ✓ Statistics from Jamaica imply that there is an obvious lack of both property and health insurance among individuals.
- ✓ Health insurance is subsidized by the state for governmental workers. Companies are obliged to do the same but it is hard to control.
- ✓ The lack of subsidization and social trust seems to be the most prominent causes to the lack of insurance coverage among the Jamaican population.
- ✓ On a national level, Jamaica is covered through the CCRIF, which provides liquidity in the aftermath of a disaster and covers the loss of income and expenditures suffered.
- ✓ The case of Hurricane Katrina poses a terrible scenario where the lack of communication between the insurance industry and individuals caused the majority of the properties affected by this disaster in 2005 to be uncovered.
- ✓ Micro insurance provides the possibility for poor individuals to obtain both property and health coverage. However, individuals within squatter settlements cannot obtain property insurance as they do not own the land which they occupy.

### 3.5.1. Progression of Vulnerability in Jamaica

Jamaica's vulnerability to natural hazards can be defined through an analysis of the Progression of Vulnerability in Jamaica. The different variables of root causes, dynamic pressures and unsafe conditions are analyzed below.

### 3.5.2. Vulnerability and natural hazards



In terms of natural hazards, Jamaica is a nation that is prone to the majority of the stated hazards within the model. The seismic activity in the Caribbean is unmistakable after the Haiti earthquake in 2010, even though Jamaica itself has not experienced a large earthquake in well over a century. The seismic activity is explained by the fact that the Caribbean is geographically located at the junction of the Caribbean Plate and the North American Plate (Tony Gibbs, 2001). Additional prominent natural hazards include hurricanes, torrential rains and storm surges. With respect to hurricanes, the Caribbean is located in the North Atlantic Ocean, which is one of six main tropical areas in the world where hurricanes can develop annually. Hurricanes are defined by their high wind speeds and torrential rains that produce flooding and occasional storm surges (Tony Gibbs, 2001).

**Figure 2.0 Progression of Vulnerability in Jamaica**

### 3.5.3. Root causes

The political structures of Jamaica involve political corruption as mentioned earlier. The JDIP is a prime example of how resources allocated for the infrastructural development are misused rather than invested in the common good of the population. The importance of a well functioning infrastructural network in the event of natural hazards is invaluable. With inadequate drainage systems, flood conditions can more easily occur than if these systems were adequate. Poor infrastructure also severely impacts Jamaica's ability to evacuate its population in the event of a disaster. The infrastructure in some Jamaican regions is insufficient to the extent that the resources of the fire department would be wasted if they attempted to reach a fire in a number of communities (Anthony Lewis, 2012). *"I can tell you this... It doesn't make any sense trying to go up there to save a structure there; we will not reach on time."* - Courtney Nembhard, District Officer at the Hanover Fire Department (Anthony Lewis, 2012). Furthermore, this misuse of loans highly compromises the security of the population and further contributes to increasing Jamaica's vulnerability and foreign debt (Heather Stewart, 2010).

It is further argued that there is a strong correlation between economic development and levels of corruption. A corrupt nation such as Jamaica is thus per se economically underdeveloped. According to Coppola, poverty and disasters are intimately connected which would suggest that the financial situation in Jamaica highly contributes to an increased vulnerability to natural hazards (Coppola 2011, 288).

The consequences of political corruption in the Jamaican context manifest itself in the lack of social trust. Even though social trust is discussed under “unsafe conditions” in this thesis, most of the variables within the PVJ are somewhat interrelated. It is noted that Jamaicans generally believe that politicians are fake and that they simply seek profits rather than focusing on the holistic development of the nation (Interview with Powell 2012-02-23). The economists Andrew Healy and Neil Malhotra argue that poorly supported governments spend much more resources on disaster relief than on disaster preparedness, even though the latter is more efficient in the long run in terms of resources. This occurs as disaster relief spending is far more visible to a nation’s population (voters) than preventative measures. *“As a result, Healy and Malhotra argue that politicians have an incentive to misallocate public funds, thereby wasting resources and increasing the number of fatalities caused by natural disasters.”* (Ilya Somin, 2011). In other words, governments that need to attract voters might deceive their population into believing that a large amount of resources are put towards disaster management, resources that instead should have been invested in preventative measures in order to mitigate the impact of the disaster.

Moreover, another consequence of political corruption is a profound foreign debt. However, it should be noted that the majority of the foreign debt was attained in relation to Britain’s colonial occupation. Although, the contemporary misuse of loans reserved for development is primarily what is maintaining the debt. As argued earlier, Jamaica had in 2010, the fourth highest debt as percentage of GDP in the world. This indebtedness will highly affect the recovery of Jamaica in the aftermath of a future disaster as the nation can enter a vicious circle of economic distress where the financial burden is too high, and the future investment to mitigate the loans is insufficient. However, in terms of liquidity in the event of a disaster, Jamaica is a member of the CCRIF, which means that the nation is covered against the loss of income and expenditures suffered in the aftermath of a disaster given that the CCRIF grants the payments.

#### **3.5.4. Dynamic pressures**

25 % of all the mapped squatters in Jamaica are located within 100m of a waterway which means that these settlements are at constant risk of being affected by flooding and storm surges, especially in deforested areas where the top soils ability to absorb water is reduced. A number of settlements are also located within areas characterized by mountains and steep slopes and are thus especially vulnerable to landslides caused by deforestation and soil erosion.

However, in terms of the vulnerability within these communities, it is generally not the location per se that poses the greatest hazard, but the lack of sanitation and safe facilities. The majority of the buildings within Jamaican squatter settlements are predominately constructed from a combination of board and concrete, which is not as hazard resilient in comparison to solid concrete buildings (National Squatter Survey 2004, p 49). The lack of knowledge when it comes to constructing hazard resilient facilities within these settlements

is also, as argued earlier, a contributing factor as the majority of the inhabitants are defined as unskilled labor. Moreover, these settlements are also particularly vulnerable to diseases in the aftermath of a disaster due to unsanitary living conditions.

Wisner et al. explains that fragile constructions can be a direct consequence of non-existing building codes (Wisner et al 1994, p 55). However, Powell argues that there is an existing building code implemented by the Jamaica Institution of Engineers (JIE) that makes sure that all the new facilities constructed on the island exceed a certain standard. This means that the majority of these facilities would be able to withstand a 7.0 magnitude earthquake, similar to the one that struck Haiti in 2010, and are therefore less vulnerable to a number of different hazards (Interview with Powell 2012-02-23).

The future prospects of these communities are poor as squatter settlements tend to be of marginal importance to those who hold economic and political power (Wisner et al 1994, p 53). This essentially means that the development of 20 % of the population is ignored by the state and as they are illegal occupants and thus are not paying taxes.

The consequences of the socio-economic deprivation within these settlements can take many forms. Individuals that are affected by poverty are often unwilling or unable to take part in risk reduction measures that do not fully account for their poverty. *“If risk communicators do not consider the economic means and monetary constraints of their audience, their message will surely fall upon deaf ears.”* (Coppola 2010, p 288). Poor people in Jamaica both within and outside the squatter settlements do not live in hazardous locations because they do not know about the risks, but because they cannot find alternate housing because of their financial situation. Thus, informing poor individuals about the fact that they are at high risk will have little or no effect (Coppola 2010, p 288).

### **3.5.5. Unsafe conditions**

In terms of the unsafe conditions of criminality, it can be regarded as another major consequence of the socio-economic deprivation within the squatter settlements.

The General Strain theory describes the relation between youths within marginalized communities and school dropouts. However, it should also be noted that according to Agnew, this relation is just as common within all social classes. A study on Jamaican youths conducted by the United States Agency for International Development (USAID) explains that 11 000 students drop out of school before they reach the ninth grade. It is also stated that the unemployment rate of these youths are twice the national rate, and that they are particularly vulnerable to gang crimes (Ruth Chrisholm, 2010). Moreover, the lack of school attendance has a big impact on disaster preparedness in Jamaica, as schools are instrumental in providing disaster training. If youths, particularly within squatter settlements, are not obtaining this knowledge through schools, it is highly unlikely that they will obtain it at all. Marginalized communities are “socially excluded” from the Jamaican society and are therefore not receiving any disaster training like the rest of the communities (Desmond Hall, 2009). Furthermore, the trends of school dropouts in Jamaica are unlikely to reverse as approximately 50 percent of Jamaica’s income is used for debt repayments (Ruth Chrisholm, 2010). This essentially means that the resources available to implement social programs are very limited.

It is further argued through the General Strain theory that these school dropouts evoke feelings that are closely related to delinquency, which in return foster violence, another major concern in Jamaica. Resources that could have been invested in disaster preparedness are instead used to fight criminality. This prioritization is unlikely to change unless crime rates drastically decline or if Jamaica's contemporary vulnerability is exposed in the event of a major disaster.

Moreover, many individuals in Jamaica are vulnerable to the economic consequences that arise in the aftermath of a disaster, due to the lack of state subsidizations with respect to insurance coverage. Without adequate insurance coverage, it is primarily Jamaica's poor population (predominately located within the squatter settlements) that may be exposed to the aforementioned poverty traps. Insurance is essential in within the concept of disaster management as it provides good conditions for a quick recovery in the aftermath of a natural disaster. The lack of hazard mitigating equipment such as fire extinguishers among Jamaicans is another hazardous feature as it increases the population's vulnerability against secondary hazards that might be equally destructive and deadly as a primary hazard.

## 4. Discussion and Conclusions

The very purpose of this thesis was *to investigate what prominent factors that affect Jamaica's vulnerability and ability to manage natural disasters*. In conclusion, this thesis has contributed to an expansion of the existing disaster management literature relevant to the case of Jamaica and the Caribbean context.

Through empirical conclusions, the most prominent causes to an increased vulnerability are, as mentioned:

- Political Corruption in Jamaica which during the past few years has severely hindered the infrastructural development on the island. The consequences of a congested infrastructural network can be described as both evident and severe and affect the island in a number of different ways, such as through increased vulnerability against flooding and increased foreign debt.
- The individuals within the squatter settlements are more vulnerable to natural hazards because of socio-economic deprivation. Poorly constructed facilities and unsanitary conditions pose low resilience against natural disasters. Moreover, the common school dropouts contribute to a reversed "brain drain" where individuals struggle to obtain disaster training and knowledge.

Furthermore, other factors also provide explanations to Jamaica's high vulnerability to natural hazards and disasters. One major contributing factor is that the Jamaican culture is reactive, or "event based". This means that Jamaicans will not respond unless a natural disaster or major hazard occurs. Culture is most influential to people's ability to function in the event of a disaster.

Moreover it is claimed that cultural experiences of natural phenomena are important. Jamaica is a nation that is annually subjected to different natural hazards which means that people from empirical observations more or less know how to manage the situation. There have been cases in India where the cultural experience in terms of natural hazards has not been extensive, which in return resulted in people progressing towards the seacoast out of curiosity in the aftermath of an earthquake, rather than running away. *"The receding of sea water as an extreme danger sign was not part of the cultural knowledge."*(Joshi 2007, p 1). However, even though cultural experiences are important, it does not undermine the importance of disaster training.

Event-based cultures are generally explained by the lack of rational behavior among the population. Individuals that have never experienced a large-scale natural disaster are not acquainted with the destructive force of nature, and thus do not prepare for worst-case scenarios (Amanda Ripley/Boulder 2006, p 1). Even with hurricanes Ivan, Dennis and Emily included, Jamaica has not experienced a major natural disaster since the Kingston earthquake in 1907. This would imply that a very low number of the current Jamaican population have actually experienced a large scale catastrophe, which serves as an explanation to why the culture is event-based and not built up around rational thinking.

Another variable that highly affects Jamaica's vulnerability is religiosity and as it turns out, Jamaica is defined as one of the most religious countries in the world. Therefore it is claimed that Jamaicans tend to have a lot of faith in God and as a result neglect the importance of

property and health coverage as they pray that calamity will not strike them. This can severely impact the recovery pace and expose financial poverty traps in the aftermath of a natural disaster.

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## Appendix – Interviews

### Interview with La-Jean Powell concerning Jamaican Disaster Management: 15/2-2012

#### Questions:

How is disaster management funded in Jamaica? Do you receive any foreign aid?

If you do, how can you guarantee that the money is put in good use?

Is Jamaica cooperating with any international associations/organizations? Do you have to answer to them?

How much money is spent on disaster management annually? Is that number increasing or decreasing?

Have you experienced an increasing amount of disasters in Jamaica?

What disasters are the most devastating in terms of death toll and expenses?

How do the disaster management plans in Jamaica work? Are they separated by the different parishes?

Jamaican Disaster Management influenced by a foreign model?

What is, in your opinion the biggest challenge in terms of Jamaican Disaster Management?

How was Jamaica affected by the Haiti earthquake in 2010? How did Jamaica assist Haiti?

Is Jamaica investing in earthquake proof facilities? Why, why not?

Could you tell us a bit more about the Jamaican Development Infrastructure Programme?

In what parts of Jamaica do the most squatters live? Do you know if anything is done to improve their situation?

Do you know if house and health insurance is common in Jamaica?

Do you think the lack of insurance can have financial implications in the event of a disaster?

**Interview with La-Jean Powell concerning social trust and insurance: 23/2-2012**

Questions:

Do you believe that Jamaicans generally trust the government? Corporations?

Why do you think the social trust is low?

Is social trust important?

How common is property and health insurance in Jamaica?

Is there a need for insurance coverage?

What are the explanations to the lack of insurance coverage on an individual level?

How expensive are fire extinguishers?

**Interview with Olivera Bogicevic concerning social trust and squatters in Jamaica:  
14/4-2012**

Questions:

Do you know if there's a connection between political corruption in Jamaica and the squatter settlements? Is it solely an economic question or is it a matter of social trust against the Jamaican government?

What does social trust look like in Jamaica? I'm writing about the lack of insurance coverage in the Jamaican context. Do you believe that Jamaican corruption is negatively affecting the insurance industry?

**Interview with Gabriel Abdellah concerning fire extinguishers: 21/4-2012**

Questions:

What's the purpose of a fire extinguisher?

How important is a fire extinguisher?

What are the alternatives to a fire extinguisher?

How important is knowledge in this matter?

What would you say to people that don't have a fire extinguisher?

**Interview with Jerker Albin and Tommy Ohlsson concerning insurances in Developing Countries: 28/4-2012**

Questions:

Do you think that social trust is important in terms of the services that the insurance industry offers? By social trust I mean the phenomena where individuals generally trust one another as well as the government and corporations. What do you do at Willis Insurances to make sure that the customer can trust you?

How important do you think health and property insurance is?

Do you think that the lack of insurance coverage can create financial poverty trap in the event of a disaster (in developing countries)?

Why do you think that many middle/high-income takers in developing countries ignore insurance coverage? Do you think that it's a matter of resources as individuals can afford to rebuild a house in the event of a disaster? Or do you think that it's a result of ignorance and denial that a disaster can strike?

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## Appendix - Questionnaire

### Insurance coverage and fire extinguishers – Manchester Parish Council

Do you have a home insurance?

Yes

No

If answering YES, how long have you had it for? \_\_\_\_\_

Do you have a health insurance?

Yes

No

If answering YES, how long have you had it for? \_\_\_\_\_

If answering NO on any of the questions above, why don't you have one?

Please specify:

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Do you have a fire extinguisher at home?

Yes

No

If answering NO on the question above, why don't you have one?

Please specify:

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Thank you for your time!

Morgan Jönsson