Case Study Fact File

Luke Pearson |
geographyportal.co.uk
02.09.20 V1.1

Hazards >> Multi-Hazard Environment
Hazards >> Tropical Storms
Hazards >> Seismic Events

Haiti [LIC]

Topics:

Pt. 1 Case study of a *multi-hazardous environment beyond the UK* to illustrate and analyse the nature of the hazards and the social, economic and environmental risks presented, and how human qualities and responses such as resilience, adaptation, mitigation and management contribute to its continuing human occupation.

Pt. 2 Impacts and human responses as evidenced by *contrasting recent seismic events.*

Pt. 3 Impacts and human responses as evidenced by *two recent tropical storms in contrasting areas of the world.*

Pt. 1

Haiti As A Multi-Hazard Environment:

What is a Multi Hazard Environment?

A location which is at risk of experiencing ***two or more hazards***. Otherwise known as a ***disaster hotspot***. *They are usually highly vulnerable and sometimes ill-prepared despite experiencing hazards often.*

Figure 1. Haiti has experienced 12 major disasters since 2004, with a cumulative death toll of 235,000, possibly far greater. Notably, they vary in type and scale, showing the wide vulnerability Haiti has.

Year:	Disaster Type:	Death Toll:	Total Affected:
23.05.2004	Flood	2665	25 000
17.09.2004	Storm (Jeanne)	2754	80 000
28.10.2007	Storm (Noel)	90	108 763
26.08.2008	Storm (Gustav)	85	865 000
02.09.2008	Storm (Hanna)	529	865 000
06.09.2008	Storm (Ike)	74	865 000
12.01.2010	Haitian Earthquake	222 570	3 700 000
22.10.2010	Epidemic	7128	513 997
24.10.2012	Storm	75	201 850
01.01.2014	Drought	0	1 000 000
01.01.2015	Epidemic	40	800 000
04.10.2016	Storm (Matthew)	580	1 125 000

Background Information:

According to the World Bank's Natural Disaster Hotspot study, the countries at relatively high mortality risk from multiple hazards include Bangladesh, Nepal, the Dominican Republic and Haiti (**6th Most Vulnerable.)** All of the places named suffer from more than one type of natural disaster, are **lower income countries** and are **located near plate boundaries, near large rivers or the coast and experience tropical storms**.

Haiti is the **poorest and least developed country in the Western Hemisphere**, but the situation is slowly improving. This has contributed to its vulnerability to natural hazards but also the hazard impacts and responses in a sort of vicious cycle, whereby authorities are consistently unable to effectively prepare for and manage hazards, relying instead on billions in foreign aid each time.

More detailed info on Haiti as a multi-hazardous environment <<

Haiti Dashboard:

HDI	*Life Expectancy*	*GDP p.c.*	*Population*
2010 0.467	*2010 60.5*	*2010 $665*	*2010 9.5 Mill*
2018 0.503 +	*2018 63.7* +	*2018 $868* +	*2018 11.1 Mill* +

Factors Affecting Vulnerability In Haiti:

When appreciating the nature of a Multi-Hazard Environment, it is important to understand the contributary human and physical factors which ease or worsen a hazard's impact in Haiti. Have a look at the list below and make a judgement yourself as to which is most influential.

Physical:	*Human:*
• Haiti is located on the **plate margin** where the North American Plate is sliding past the Caribbean Plate, causing huge amounts of friction and a large seismic hazard risk. • The country's **unusually shaped landmass** also contributes to it being highly vulnerable, with **limited accessibility** to southern and northern peninsula towns and communities. • Haiti's **topography** furthers this challenge, as it is very hilly, prompting further sub-hazards such as landslips and mudslides. • Haiti also falls directly within the track of many **Hurricanes and Tropical Storms** travelling South/North, placing it at further risk.	• The people of Haiti are particularly vulnerable to hazards as they mostly live in **poor-quality housing**, with **high levels of poverty** (77 per cent living on less than US$2 a day) • The **population is concentrated on the flood-prone coastal areas** (at population densities of up to 40 000 km2 in Port-au-Prince). • Haiti suffers from **constant political instability and corruption** that further increases its vulnerability to disasters, unable to effectively prepare for disasters. • Owing to **poor healthcare and sanitation** there is a high likelihood of **further epidemic outbreaks following a natural disaster**, for example Cholera in 2010.

[A Further Reading]* *Resilience, Adaptation, Mitigation and Management In Haiti:*

"Before the earthquake, the people of Haiti were already vulnerable to disasters due to systemic poverty, fragile governance, insecurity and a continual threat of natural disasters. The Haitian government had taken some actions to improve disaster preparedness and response. In 2001, the **National Disaster Risk Management System (NDRMS)** was set up to transition from a' living at risk' to' living with risk' approach to natural hazards. Disaster risk reduction is also a priority of the United Nations Development Assistance Framework, as well as the World Bank's Country Assistance strategy as it is believed to be a critical component of a country's poverty reduction and economic growth strategy.

The NDRMS has worked towards the following:

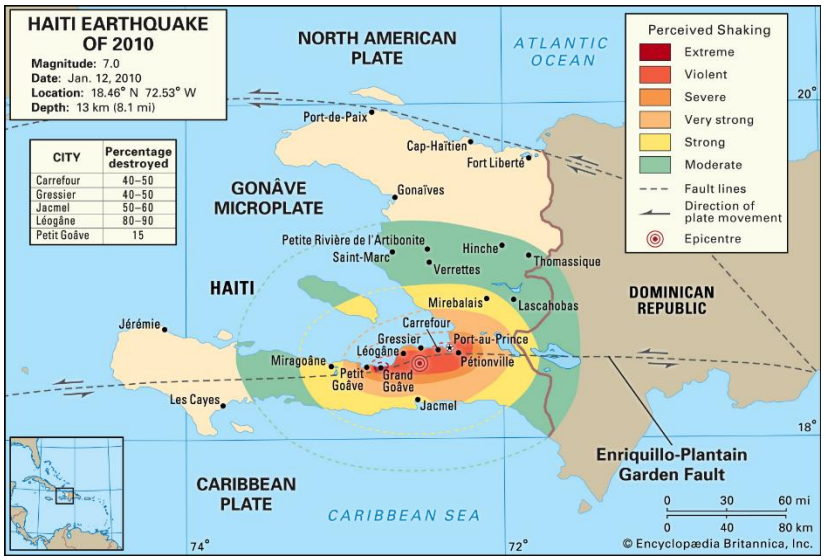
• A national natural hazard and disaster vulnerability map completed in association with Oxfam can help disaster planning and preparation activities.

• The development of an Emergency Operations Centre where civil servants can manage disasters.

• Expanding the number of weather-monitoring stations across the island so that the National Meteorological Centre (NMC) can supplement data provided by the United States' National Oceanic and Atmospheric Administration' (NOAA) National Weather Service forecasts. Forecasting can provide vital time for people to prepare or evacuate."

Pt. 2

The 2010 Earthquake In Haiti:



Background Information:

On the morning of the 12 January 2010, built up pressure between the Caribbean and Gonâve Microplate caused a **magnitude 7.0 earthquake** with an epicentre 25 km west of the capital, Port-au-Prince, **one of the worst disasters of our time**.

Most of the damage occurred in the capital, due to the **shallow focus** (13 km), **strength of shaking, high population density and poor-quality of housing**. Two million people were displaced; many ended up living in social and economic situations worse than before the earthquake. Ten months after the earthquake, partially as a result, **cholera** quickly spread along the Artibonite River, killing 9 000 people.

Local Impacts:

- Est. **220,000 people lost their lives** in the earthquake.
- In addition, swathes of land for agriculture were destroyed and rivers became polluted and toxic.
- Over **30,000 commercial buildings collapsed**, as did hospitals, schools, roads, and homes.
- Essential services and communicate lines were completely cut, necessary to respond to the disaster.

Wider-Scale Impacts:

- **Two million Haitians were displaced** to temporary accommodation and housing projects such as Village Solidarité.
- The economic ramifications were significant – costing up to **$8.5 B in damages** – around 90% of GDP.
- Tens of thousands had to be buried in mass, unmarked graves around Port-au-Prince.
- The Prison Civile de Port-au-Prince was destroyed, allowing around 4,000 inmates to escape, leading to **widespread looting and violence**.
- Many municipal buildings including the national palace (below) collapsed, preventing an organised response.

Short-Term Responses:

- Most watched Telethon in history **"Hope for Haiti Now" raised $58 M** within a few days.
- Since the local emergency NDRMS centre was destroyed, an international emergency response was needed.
- **4 million people received food aid**.
- **1.5 million people received emergency shelter materials**, which were set up around the country.
- Many countries sent experts in medical, evacuation and hazard management fields to help search for survivors and clear rubble.
- Mobile phone data and GIS was extensively used to track the movements of Haitians and geo-tag 80,000 Haitian Creole messages to channel aid.

Long-Term Responses:

- Environmental clear up and replanting efforts have taken place since, regenerating ecosystems.
- **$13.5 B in aid was pledged** (a lot has since gone missing) to the relief efforts from over 100 nations around the world, the largest in history.
- Some argue that **poor governance** has meant Haiti has not fully recovered from the devastation of the 2010 earthquake, with numerous buildings and infrastructure still destroyed, and ongoing disasters hampering the rehousing programs.

'SEEP' Tracker Box

Social Economic Environmental Political

Pt. 3

2016 Hurricane Matthew In Haiti:

How do tropical storms form? Click here for more info

Background Information:

Hurricane Matthew hit southwestern Haiti near Les Anglais on October 4, 2016, leaving widespread damage in the impoverished nation still suffering with the effects of the 2010 earthquake. The hurricane made landfall as **Category 4** (on the Saffir-Simpson scale) estimated **maximum sustained winds of 240 km/h (150 mph),** making it the strongest storm to hit the nation since Hurricane Cleo in 1964, and the third strongest Haitian landfall on record, causing widespread destruction, particularly environmental, in which more destruction was done than a comparable seismic event.

Local Impacts:

- **Estimated 580 deaths** from the Hurricane, but some organisations peg this at 3x the amount.
- The environmental impacts of the disaster were tremendous, with the **storm knocking down 90% of coconut trees** on the Tiburon Peninsula, and **destroyed entire coffee and cocoa plantations**.
- With most of the region's **crops destroyed** and **350,000 animals killed**, residents in southern Haiti were left without a source of food
- Power lines, communications and infrastructure were also destroyed along the track of the hurricane.

Wider-Scale Impacts:

- Nationwide, the hurricane **destroyed 200,000 homes, leaving 1.4 million people in need of humanitarian aid.**
- It is estimated that the **disaster cost $2.8 B.**
- The 2010+ Cholera outbreak worsened post-disaster.

Short-Term Responses:

- **UN forces immediately dispatched their own aid and peacekeeping forces**, learning from the mistakes of 2010, to prevent civil unrest and perform environmental cleanups.
- In the storm's aftermath, humanitarian agencies had about **400 operations throughout Haiti** to provide relief to storm victims, with **NGOs** including the Red Cross, Oxfam, CARE, World Vision and Action Against Hunger all helping out.
- Ahead of the annual hurricane season, the **World Food Programme (WFP)** had pre-positioned 3,410 tons of food, which helped responses significantly.

Long-Term Responses:

- The **UN** launched an appeal for **nearly US$120 million in aid**, and countries throughout the world provided money, supplies, and logistical support over a year-long period.
- There is still to this day destruction across Haiti from Hurricane Matthew and 2010 which hasn't been rebuilt, partially owing to **high-level corruption**.

Stretch & Challenge > Think about:

Hurricane Matthew was significantly better managed than previous natural hazards in Haiti, with external and internal agencies working around-the-clock in advance of the disaster to evacuate 340,000 people and protect livelihoods as best as possible. To what extent do you think this is due to learnings, or to the easier nature of tracking a hurricane?

'SEEP' Tracker Box

Social Economic Environmental Political

Links & References:

What Case Studies Can This Be Linked To?

Multi-Hazard Environments:

You need only know one example for this section.

Tropical Storm Hazards:

You must know at least two recent tropical storm case studies, advisably one in a HIC and one a LIC. SUGGESTED: EITHER HAITI & KATRINA / KATRINA & PHILIPPINES

- **A* Case Study I 2013 Typhoon Haiyan, Philippines** (link to be added when CSFF is produced)
- **2005 Hurricane Katrina, USA**

Seismic Hazards:

You must know at least two recent seismic event case studies, advisably one in a HIC and one a LIC. SUGGESTED: HAITI & JAPAN

- **2011 Tōhoku Earthquake And Tsunami** (link to be added when CSFF is produced)

Have A Go At Practice Exam Questions:

Multi-Hazard Environments:

20 MARKER (AO1 & 2) QUESTION #2

With reference to a multi-hazardous environment that you have studied, assess the view that the underlying cause(s) leading to the hazards is human activity rather than physical factors.

Tropical Storm Hazards:

9 MARKER (AO1 & 2) QUESTION #2

With reference to one or more tropical storms that you have studied, assess the extent to which exogenous factors (relationships with other places) assisted with the response to the hazard created…

20 MARKER (AO1 & 2) QUESTION #1

With reference to at least two named examples, to what extent do you agree that 'the development of a country is the greatest determinant of impacts of a tropical storm?'

Seismic Hazards:

9 MARKER (AO1 & 2) QUESTION #3

To what extent do you agree that "The Human Development Index [HDI] of the affected area gives us the best indication of how severe the impacts of a Seismic event will be?"

Many of these questions may have exemplar answers and mark schemes available, feel free to look at them for information.