

# Climate Change & Small Island Developing States

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# What is climate change?

- **Weather** - a day-to-day phenomenon.
- **Climate change** - distinct changes in measures of climate lasting over a long period of time mainly due to:
  - natural variations and
  - human-induced activities such as burning of fossil fuels and deforestation.
- When climate change is discussed, it is often the human-induced change that is referenced and results from increased concentrations of greenhouse gases (GHGs) (e.g. CO<sub>2</sub> and water vapour).

# Small island developing states (SIDS)

- Many SIDS are low-lying countries with development centred along the coast.

- Particularly vulnerable to the impacts of climate change.

- Majority are in the tropics and are seasonally affected by extreme weather events such as hurricanes, tropical storms and cyclones.

- Affected by climate variability: droughts and flooding which are threats to human settlements, infrastructure and the economy.

## Small island developing states (SIDS)

- Many economic and climate-sensitive sectors such as water, tourism, agriculture, fisheries and forestry depend on natural resources for economic development.
- That means that climate change is a major threat to SIDS overall development –in the built and natural environment.
- Most SIDS rely on fossil fuels but are exploring renewable sources of energy. However, emissions from SIDS are very low compared to industrialised countries.

# CC & its impact on SIDS

It is projected that small island developing states (SIDS) will suffer from the following effects, due to global warming:

- sea level rise
- increasing temperatures
- more frequent droughts
- longer dry periods and
- more intense rainfall episodes/changing rainfall patterns.



# POSSIBLE EFFECTS OF CLIMATE CHANGE ON JAMAICA BY SECTOR

# Sectors likely to be affected by climate change

The sectors/areas in Jamaica that will be most affected by climate change are:

- Marine & terrestrial resources
- Freshwater resources
- Human settlements and infrastructure
- Agriculture and food security
- Tourism
- Human health
- Energy
- Poverty
- Gender



# Marine & Terrestrial Resources

A decline in marine and terrestrial biodiversity has implications for tourism, local economy and nutrition in Jamaica. The viability of sea turtles, coral reefs, coastal and terrestrial vegetation will also be affected.

The following impacts are likely to occur:

- beaches, including coastal lands, eroded;
- fish production reduced;
- reefs and calcareous species reduced;
- fish kills, coral bleaching and degradation of marine;
- acidification of oceans;
- changes in terrestrial and marine biodiversity;
- destruction of coastal ecosystems, marine habitats, spawning grounds.

# Cumulative Summary of Beach Erosion in Jamaica: 2016

FDES Topic 1.2.2.  
Ecosystems and  
biodiversity

## Cumulative Summary of Beach Erosion in Jamaica: 2016

Parish/Location	No. of Sites	Cumulative Mean Beach Width (m) 2015	Cumulative Mean Beach Width (m) 2016	% Change 2015-16
Portland	5	18.60	23.98	29.0
Kingston	9	48.43	50.11	3.5
Trelawny	2	20.67	18.75	-9.3
Westmoreland (Other)	2	14.30	15.30	7.0
Negril (Hanover/Westmoreland)	14	31.75	37.39	13.0
Clarendon	2	16.87	27.15	60.9
Average		25.10	28.78	17.4

Source: National Environment and Planning Agency

In 2016, there was a 17.4 per cent increase in beach width across the 34 locations assessed when compared to 2015.

# Freshwater Resources

Jamaica relies heavily (84%) on groundwater, therefore this sector is extremely vulnerable to climate variability and change.

The possible impacts include:

- sea water intrusion
- excessive evaporation
- sanitation issues
- increased soil erosion
- greater levels of sedimentation in reservoirs and dams
- sediment transport to coastal areas
- adverse shifts in climatic conditions for agricultural cultivation at certain altitudes;
- increasing degradation and destruction of watersheds
- shortage of water due to prolonged droughts
- damage to infrastructure.

# Human Settlements and Infrastructure

With increased development activities taking place within the coastal zone, the risk posed to human settlements from disasters has been heightened significantly.

- The most threatened settlements are those that have been created outside the formal physical planning system, and do not meet the required planning and building standards.

It is anticipated that climate change impacts will increase the vulnerability of human settlements to floods, storm surges, sea level rise and hurricanes.

# Estimated Economic Impact of More Recent Extreme Climate Events on Jamaica

4.1.2.b: Economic losses due to natural extreme events and disasters

Estimated Economic Impact of Recent Extreme Climate Events on Jamaica				
Event	Year	Category	Cost (J\$ billions)	Impact (% of GDP)
Hurricane Michelle	2001	4	2.5	0.8
May/June Flood Rains	2002		2.5	0.7
Hurricane Charley	2004	4	0.4	0.0
Hurricane Ivan	2004	3	36.9	8.0
Hurricanes Dennis & Emily	2005	4	6.0	1.2
Hurricane Wilma	2005	5	3.6	0.7
Hurricane Dean	2007	4	23.8	3.4
Tropical Storm Gustav	2008		15.5	2.0
Tropical Storm Nicole	2010		20.6	1.9
Hurricane Sandy	2012	1	9.7	0.8
Hurricane Matthew	2016	4	n.a.	n.a.

Source: Planning Institute of Jamaica and Office of Disaster Preparedness and Emergency Management

n.a. = not available

# Agriculture and Food Security

Agriculture is one of the mainstays of the local economy and is one of those most susceptible to climate change impacts.

The potential impacts to the sector associated with climate change are:

- Decreased precipitation and its affect on agro biodiversity;
- Increases in agricultural pests and diseases;
- Effect of extreme events on agricultural infrastructure, livelihoods and assets;
- Decrease in the availability of water resources;
- Reduction in water quality due to saline intrusion into groundwater sources;
- Accelerated soil erosion due to the occurrence of extreme events (floods, hurricanes etc.);
- Reduction in soil fertility due to soil salinization caused by rising sea levels.

# Agriculture and Food Security

- Reduction in crop yields;
- Loss of marine resources due to destruction of spawning grounds;
- Damage to agricultural infrastructure and assets;
- Mass disruption to food security;
- Loss of employment and income earning opportunities;
- Loss of foreign exchange;
- Increased demand for foreign exchange for food imports.

# Tourism

The climate of a destination forms part of the product it offers and can either deter or attract visitors. Since tourism is a major income earner in Jamaica, climate change has negative implications for the local economy.

Impacts to the industry are expected to include:

- Damage to and destruction of hotels and other tourism infrastructure located in coastal areas susceptible to storm surges, beach erosion and sea-level rise;
- Increased demand for water resources and food production;
- Heat stress leading to higher cooling costs, changes in plant, wildlife and insect populations;
- Loss of archaeological, cultural and heritage attraction sites;
- Extensive coastal erosion resulting in the loss of beach;
- Increased cost to protect coastline;
- Loss of economic returns;
- Reduced visitor arrivals.



# Human Health

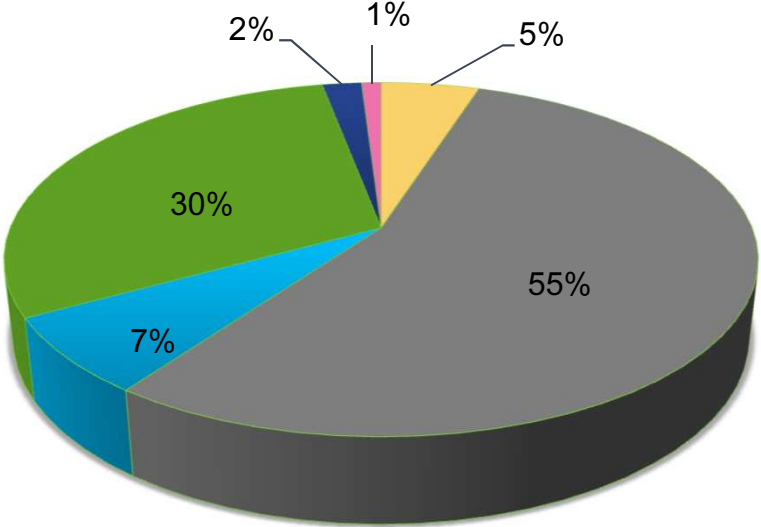
Climate change will bring about more storms, floods, droughts, and heat waves, which are all expected to threaten the determinants of health (air, water, food, shelter and freedom from disease) resulting in the following impacts:

- increase in respiratory diseases, heat-related illnesses and public health consequences leading to increased morbidity and mortality rates, particularly in the elderly;
- increase in the incidence of vector-borne diseases (such as dengue fever, malaria and yellow fever);
- increase in water-related diseases, exacerbated by poor sanitation, unplanned settlements and pollution to watersheds and water sources;
- potentially more deaths and injuries;
- given the vulnerability of the agricultural sector, food security could be compromised.

# Energy

- Climate change threatens the efficient production of energy.
- Given the high dependence on foreign energy sources across all sectors, this could increase Jamaica's overall economic vulnerability.
- Increasing temperatures will likely increase energy costs for cooling aids.
- Other variables, like rainfall patterns and extreme weather events (hurricanes and storms), frequently affect this sector by damaging infrastructure and distribution of energy.

# Total Carbon Dioxide Emissions by Regulated Industry: 2013



**FDES Topic 3.1.1.  
Emissions of  
Greenhouse Gases**

- Cement and Concrete
- Sugar and Distillery
- Petroleum
- Electrical Power Generation
- Alumina and Bauxite
- Other

Source: National Environment and Planning Agency

The majority of emissions of CO<sub>2</sub> were from the electrical power generation (55%) and the alumina & bauxite industries (30%).

# Poverty & Gender

## Poverty

The impact of these climate change variables will be greater on the poor due to their socioeconomic status, living conditions, lack of access to potable water and proper health care infrastructure.

## Gender

Climate change can aggravate the pre-existing inequalities in gender-determined roles and place a special burden on females.

Women of lower socioeconomic status are often more vulnerable due to their lack of skills and employment opportunities.

The gender-specific needs of women during disasters; their earning capacity and their roles of being the main providers of care for the family; and having responsibility for household needs increase their vulnerabilities to the impacts of extreme events.

The background features a light blue gradient at the top, transitioning into a dark blue gradient at the bottom. Several horizontal stripes in shades of blue and dark blue are scattered across the middle. Numerous light blue bubbles of various sizes are floating throughout the scene, particularly concentrated on the left side.

# CLIMATE CHANGE STATISTICS IN JAMAICA

# Work on Climate Change Statistics

In 2017, STATIN produced its first report on climate change statistics *Climate Change Statistics 2016*.

- The tables and graphs presented in the publication are mainly based on the statistics and indicators included in the Framework for the Development of Environment Statistics (FDES) and includes other data relevant to Jamaica.
- The report looks at the primary drivers of climate change; the evidence and impacts of climate change; and efforts to mitigate and adapt to climate change. *Climate Change Statistics 2016* is available for download by searching at [www.statinja.gov.jm](http://www.statinja.gov.jm). It is also available on the UNSD website.
- Tables and charts in this presentation were extracted from *Climate Change Statistics 2016* report.
- In other activities, Jamaica participated in the UNSD Pilot Survey of *Climate Change-related Statistics and Indicators*.



**Thank you for your  
attention!**

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