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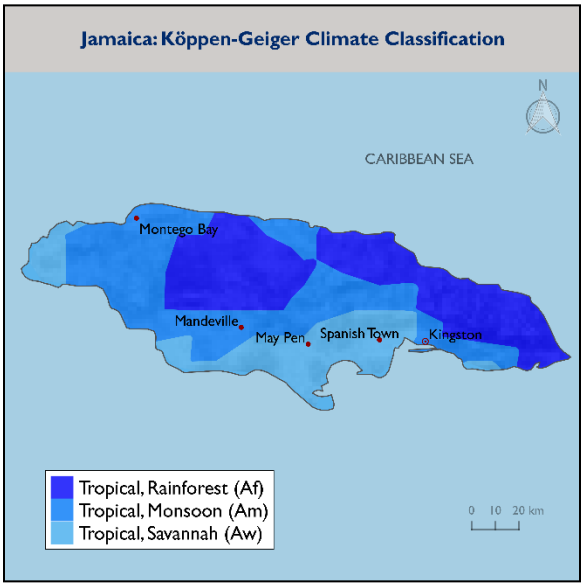
FACT SHEET

CLIMATE RISK PROFILE
JAMAICA

COUNTRY OVERVIEW



Jamaica is a small Caribbean island with a population of 2.7 million. Nearly 20 percent of Jamaicans live in poverty. Approximately 90 percent of the country's $14 billion GDP is produced within its coastal zone, making its economically valuable tourism, industry, fisheries and agriculture assets highly vulnerable to climate variability and change. Weather-related disasters over the past two decades, including those due to droughts, floods, tropical storms and hurricanes, have severely impacted Jamaica's economic growth. In 2004, Hurricane Ivan damaged key export crops such as sugarcane, banana and coffee with losses of $49 million, prompting many farmers to abandon the agricultural sector. Powerful storms can damage key transport, water supply and energy infrastructure, as well as the infrastructure supporting Jamaica's flourishing coastal tourism business. With more than half the population residing within a mile of the shoreline, many settlements are at risk. More intense rainfall events along with flooding can increase the spread of vector-borne and waterborne diseases. Marine ecosystems are threatened by increasing temperatures and rising sea levels, affecting key livelihoods and food security. Reduced rainfall and severe droughts impact the availability of scarce water resources, affecting agriculture and household use. (Citations: 2, 3, 21, 22)

CLIMATE PROJECTIONS

- 1.0 – 1.4°C increase in temperatures by 2050
- 4.8 – 7.2% decrease in average annual rainfall; consecutive dry days projected to increase by 3.6 – 15% by 2050
- 0.4 – 0.7 m rise in sea level by 2090

KEY CLIMATE IMPACTS

Water Resources
Reduced water supply
Decline in water quality

Agriculture
Reduced crop yields
Soil erosion
Damage to crops and livestock

Human Health
Spread of vector-borne diseases
Increased waterborne diseases
Increased incidence of heat stroke

Infrastructure
Damage to transportation, communication, energy and water systems; Damage to coastal infrastructure and tourist sites

Coastal Ecosystems
Beach erosion
Reduced mangroves and fish stocks
Loss of coral reefs

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This document was prepared under the USAID Climate Change Integration Support (CCIS) Task Order No. AID-OAA-TO-15-00030 and is meant to provide a brief overview of climate risk issues. The key resources at the end of the document provide more in-depth country and sectoral analysis. The contents of this report do not necessarily reflect the views of USAID.

CLIMATE SUMMARY

Jamaica's climate is influenced by a number of factors including the northeast trade winds, mountains in the interior and the surrounding Caribbean Sea. An upland tropical climate prevails on the windward side of the mountains, whereas a semiarid climate predominates on the leeward side. Average annual temperature in Jamaica is 25°C[1], with a slightly cooler season December–March (average 24°C) and a warmer season June–September (average 26°C). Average annual precipitation is about 2,100 mm (1960–2015), with peaks in October (300 mm) and May (250 mm). Annual rainfall varies significantly across the island, averaging 750 mm in the semiarid southwestern half of the island and 3,000-5,000 mm on the northeastern side. Jamaica lies in the Atlantic Hurricane belt, frequently experiencing storms August–October that contribute a large portion of rainy season precipitation. Inter-annual rainfall variability is heavily influenced by the El Niño Southern Oscillation. The June–August period is on average warmer and drier during El Niño years and colder and wetter during La Niña years. (12, 13, 14, 15, 17, 19, 22, 23, 24)

HISTORICAL CLIMATE

Observations since 1960 indicate:

- Average annual temperature increased by about 0.18°C per decade from 1960–2015.
- There was no significant trend in rainfall over 1960–2015; though in March rainfall increased significantly at 13 mm per decade.
- Sea surface temperatures increased 0.7°C per decade between 1960 and 2006.
- Hurricanes have become more intense since the 1980s, although there is still debate regarding whether this is a long-term trend.
- Sea level rose around 1.8–3.6 mm per year around the Caribbean over the past 40–50 years.

FUTURE CLIMATE

Projected changes by 2050[2] include:

- An increase in average annual temperature of 1.0–1.4°C.
- An increase in the number of "hot" days and nights[3] of about 52–59 percent.
- A decrease in average annual rainfall of 4.8–7.2 percent.
- Uncertainty in future hurricane activity, but may offset projected decreases in rainfall.
- An increase in the number of consecutive dry days[4] of 3.6–15 percent.
- An increase in extreme rainfall days[5] of 3.1–14 percent.
- A rise in sea level of 0.4–0.7 m by the 2090s, relative to 1986–2005.

SECTOR IMPACTS AND VULNERABILITIES

WATER RESOURCES

For decades, Jamaica experienced below normal rainfall; a severe drought from 2009–2010 led to water shortages and agricultural losses. Groundwater supplies 80 percent of the country's water demands and represents 84 percent of exploitable water. Rising temperatures, increased evaporation and decreasing precipitation are reducing replenishment of underground water sources and groundwater recharge. In coastal areas, sea level rise leads to seawater intrusion of aquifers, reducing freshwater supply for drinking water and irrigation. (1, 3, 5, 9)

Climate Stressors and Climate Risks WATER RESOURCES

Stressors	Risks
Increased temperatures and reduced rainfall	Increased water stress for agriculture and households
	Decreased surface water and groundwater recharge
Increased drought	Reduced water quality
Sea level rise	Salinization of coastal aquifers

[1] Based on the 1960-2015 time period.
[2] Relative to data from 1986-2015.
[3] "Hot" day or night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season.
[4] Maximum number of consecutive days per year with less than 1 mm of precipitation.
[5] Annual total precipitation when daily precipitation exceeds the 99th percentile of wet day (calculated from days when it precipitated at least 1 mm).

AGRICULTURE

Changes in precipitation, higher temperatures and extreme weather events pose risks to the agricultural sector, which contributes 7.4 percent to GDP and employs 17 percent of the labor force. In 2012, crops, livestock and irrigation systems concentrated in the eastern parishes were damaged resulting in losses of $11 million due to Hurricane Sandy. Increasing temperatures and droughts can lead to crop failure, heat stress and reduced livestock productivity. Because of increased rainfall variability and storm intensity, farmers face erosion, flooding, landslides, strong winds, new diseases and pests. These impacts threaten to decrease yields and farmer income, while increasing food security risks. (1, 3, 4, 5, 6, 9)

Climate Stressors and Climate Risks AGRICULTURE

Stressors	Risks
Increased temperatures	Increased soil erosion
	Increased in pests and disease
Decreased precipitation	Reduced crop yields
Sea level rise	Storm damage to crops and livestock
Increased storms	Increased food insecurity
	Loss of employment

HUMAN HEALTH

More intense rainfall events along with standing flood waters attract mosquitoes; this along with higher ambient temperatures can stimulate growth and reproduction, increasing mosquito-borne disease. The *Aedes* mosquito can transmit dengue, chikungunya and Zika. Endemic to the country, dengue has been a national concern for decades; from 2000–2011, there were over 3,300 cases. In 2014, the Chikungunya virus affected 60 percent of the island's population and resulted in economic losses of over $230,000 due to a labor stoppage. Since late 2015, Zika has emerged in Jamaica with 18 confirmed cases in 2016. Heavy rainfall and flooding can also contaminate groundwater sources, increasing waterborne diseases. Jamaica has one of the highest annual rates of leptospirosis in the world. Increased temperatures can also cause heat stress, which can have a greater impact on the elderly. (2, 3, 7, 11, 18)

Climate Stressors and Climate Risks HUMAN HEALTH

Stressors	Risks
Increased temperatures	Increased incidence of heat stress
Increased storms	Increased spread of vector-borne diseases
	Increased risk of waterborne diseases

INFRASTRUCTURE

Most infrastructure and settlements are situated along the 1,200-km shoreline. Beaches have experienced accelerated erosion in recent decades and are projected to disappear within the next five to ten years due to shoreline erosion and retreat. Sea level rise will magnify these vulnerabilities and accelerate coastal erosion putting key tourist infrastructure at risk. Changes in extreme precipitation events can cause flooding, while storms can damage transportation, energy, communications and water systems. In 2004, Hurricane Ivan caused $575 million in damages, with 62 percent focused directly on damage to physical assets. Storms can also put human settlements at risk and dislocate populations. (2, 3, 9)

Climate Stressors and Climate Risks INFRASTRUCTURE

Stressors	Risks
	Damage to coastal infrastructure and tourist sites
Sea level rise	Damage to human settlements
Increased frequency of extreme storms	Dislocation of populations
	Damage to power plants, powerlines and substations
Increased temperatures	Damage to transport and communications
	Damage to water supply systems

COASTAL ECOSYSTEMS

Sea level rise and storm surge increase coastline erosion and loss of beach land, including saline contamination of coastal aquifers; increases in the intensity of tropical storms and hurricanes could exacerbate these threats. Higher sea surface temperature can increase incidence of coral bleaching; this along with increased sedimentation will threaten the survival of coastal ecosystems like coral reefs, mangroves and fisheries. A decline in marine and terrestrial biodiversity can have a multiplier effect, posing risks to tourism, the economy and livelihoods. Warmer temperatures provide favorable conditions for toxic algae blooms that can increase shellfish poisoning, putting a key export at risk. Over the last decade, declining fish stocks in Little Bay, due to ecosystem degradation, beach erosion and increased storms, have forced many fishermen out of this key livelihood, while others must travel further out to sea to maintain their catch levels. (1, 2, 3, 6)

Climate Stressors and Climate Risks COASTAL ECOSYSTEMS

Stressors	Risks
Sea level rise	Flooding and inundation of low lying areas and coastal communities
Increased sea surface temperatures and decreasing precipitation	Land loss and beach erosion
	Loss of coastal ecosystems
	Salinization of aquifers
Increased storms	Reduced mangroves and fish stocks
	Increased incidence of toxic algae blooms

POLICY CONTEXT

INSTITUTIONAL FRAMEWORK

Jamaica's long-term National Development Plan (Vision 2030) along with the its National Climate Change Policy Framework call for the creation of sector-specific climate change strategies for the island's most vulnerable sectors. In 2016, the Climate Change Division (CCD) located within the Ministry of Water, Land, Environment and Climate Change moved to the Ministry of Economic Growth and Job Creation. The role of the CCD is to coordinate and facilitate all climate-related activities, including the preparation, compilation and submission of Biennial Update Reports and National Communications as well as other related activities. A network of Climate Change Focal Points was also established in each of the key ministries, departments and agencies; they are expected to support the CCD and are responsible for integrating climate change adaptation planning at the sectoral level. (7, 8, 10)

NATIONAL STRATEGIES AND PLANS

- Biennial Update Report of Jamaica (2016)
- Intended Nationally Determined Contribution of Jamaica (2015)
- Jamaica Climate Change Policy Framework and Action Plan (2015)
- Second National Communication of Jamaica to the UNFCCC (2011)
- Vision 2030 Jamaica – Our Road to Sustainable Prosperity (2009)
- Initial National Communication of Jamaica submitted to the UNFCCC (2000)

KEY RESOURCES

1. Adaptation Partnership. 2011. Review of Current and Planned Adaptation Action: The Caribbean - Jamaica.
2. Caribsave Partnership. 2012. The Caribsave Climate Change Risk Atlas: Jamaica.
3. Climate Studies Group, Mona. 2012. State of the Jamaican Climate 2012.
4. ECLAC. 2011. An assessment of the economic impact of climate change on the Agriculture, Health and Tourism sectors in Jamaica.
5. FAO. 2016. Drought Characteristics and Management in the Caribbean.
6. FAO. 2013. Climate Change and Agriculture in Jamaica.
7. Government of Jamaica. 2016. Biennial Update Report of Jamaica.
8. Government of Jamaica. 2015. Intended Nationally Determined Contribution of Jamaica.
9. Government of Jamaica. 2011. Second National Communication of Jamaica to the UNFCCC.
10. Grantham Research Institute on Climate Change and the Environment. 2015. Climate Change Policy Framework for Jamaica.

11. IPCC. 2014. Impacts, Adaptation and Vulnerability: Small Islands.
12. IPCC. 2013. Sea Level Change.
13. Koninklijk Netherlands Meteorologisch Instituut. 2017. Climate Explorer.
14. Meteorological Service, Jamaica. 2000. Jamaica Climate.
15. Meteorological Service, Jamaica. 2002. Climate of Jamaica.
16. National Environment and Planning Agency. 2010. State of the Environment Report Jamaica.
17. NOAA. 2013. Sea Level Trends.
18. PAHO. 2012. Health in the Americas: Jamaica.
19. UNDP. 2006. UNDP Climate Change Country Profiles: Jamaica.
20. USAID.2016 Analysis of Intended Nationally Determined Contributions.
21. USAID. 2013. Jamaica Country Development Cooperation Strategy 2014-2018.
22. USAID. 2011. USAID/USFS Climate Change Vulnerability Assessment and Adaptation Prioritization.
23. World Bank. 2017. Climate Change Knowledge Portal.
24. World Bank. 2015. Climate Change Knowledge Portal.

Map source: Adapted from Koppen-Geiger Classification information (Due to source pixilation, there is a lack of coverage around the edges of the country and thus assumptions were made regarding data category).

SELECTED ONGOING EXPERIENCES

Selected Program	Amount	Donor	Year	Implementer
Jamaica Disaster Vulnerability Reduction Project	$30 million	WB	2016-2022	Jamaica Social Investment Fund
Integrated Management of the Yallahs-Hope Watershed Management Area	$12.8 million	GEF/IDB	2015-2019	National Environment Protection Agency
Adaptation Program and Financing Mechanism for the Pilot Program for Climate Resilience	$12 million	IDB	2015-2019	Ministry of Water, Land, Environment and Climate Change (MWLECC)
Improving Climate Data and Information Management	$7.5 million	WB	2015-2021	Planning Institute of Jamaica
Jamaica Rural Economy and Ecosystems Adapting to Climate Change II	$12 million	USAID	2015-2019	ACDI/VOCA
Strengthening Disaster Risk Management and Climate Resilience in Jamaica's Development Planning Process	$0.7 million	EU	2015-2018	Ministries of Local Government and Community Development; Transport, Works and Housing; and MWLECC
Coastal Protection for Climate Change Adaptation in the Small Island States in the Caribbean *Regional Project*	$14 million	German Ministry for Economic Cooperation and Development	2014-2018	Caribbean Community Climate Change Centre
Deployment of Renewable Energy and Improvement of Energy Efficiency in the Public Sector	$12.1 million	GEF/UNDP	2014-2018	Petroleum Corporation of Jamaica
Enhancing the Resilience of the Agricultural Sector and Coastal Areas to Protect Livelihoods and Improve Food Security	$10 million	Adaptation Fund	2012-2016	Planning Institute of Jamaica
Jamaica Disaster Vulnerability Reduction Project	$30 million	WB	2016-2022	Jamaica Social Investment Fund