

Initiative on “Capacity Development to Support National drought Management Policy

Title: Drought Conditions and Management Strategies in Jamaica

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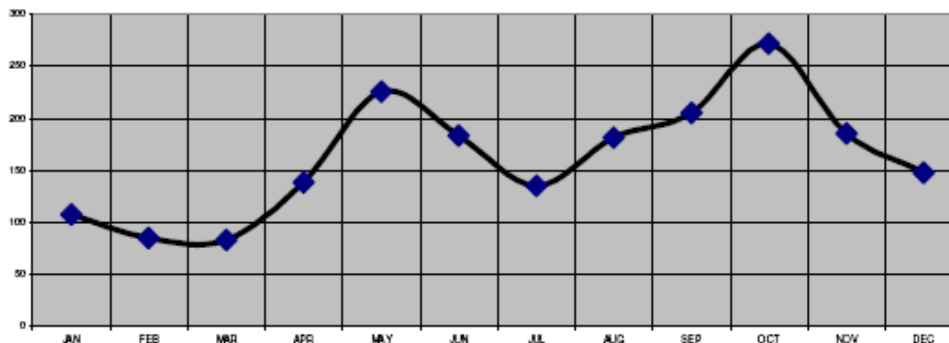
Background

Jamaica lies within the Atlantic hurricane belt (and straddles a geological fault line in the Greater Antilles). The island experiences a bi-modal rainfall pattern with distinct dry and rainy periods, the southern coast experiencing much less annual rainfall levels than the rain shadow north. This factor heavily influences the risk of the listed hydro-meteorological and associated disasters for the island. Over the past 2 decades, the frequency and intensity of natural disasters including drought directly affecting Jamaica have risen significantly.

While drought affects wide section of population resulting in frequent restrictions in water supply of for domestic and agricultural uses, agriculture is universally accepted as the most affected of economic endeavours.

Jamaica’s agricultural systems are largely rain-fed, resulting in susceptibility to variations in rainfall patterns. Vulnerability of the agriculture sector to drought coincides with periods of low rainfall which occur between the bi-modal peaks of the rainfall (Figure 1).

Figure 1: Jamaica: 30-Year Mean Rainfall 1951-1980 (mm)

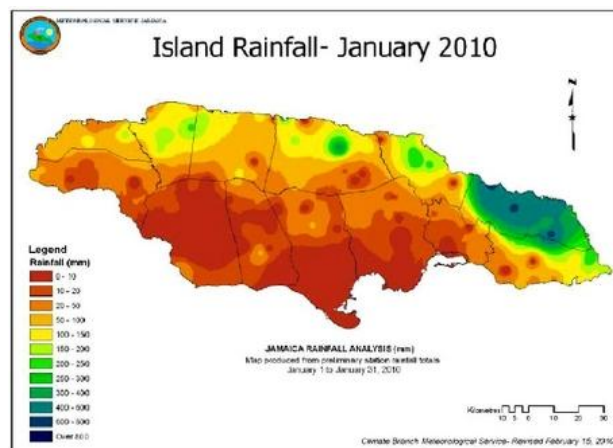


Source: Meteorological Services of Jamaica, 2009 (250 Stations)

Jamaica’s bimodal rainfall pattern consists of two peak periods with higher values of rainfall and corresponding periods of lower rainfall amounts. The primary peak occurs in October and the secondary in May. The lowest amounts are at a minimum during the period February to March and the month of July. A comparison of the old 30 year mean (1951-80) with the 1971-2000 mean by the Meteorological Service has shown that the island’s rainfall patterns and values have not changed significantly for the current thirty-year (1971-2000) period. However, the main changes noted are that of wetter dry periods and drier wet periods.

The drought conditions affecting several of the productive agricultural zones has severely restricted domestic crop establishment, as well as yields in some areas (Figure 1).

Figure 1: Island Rainfall Map- January 2010



Source: Meteorological Services of Jamaica (2010)

At present, the most severely impacted by drought parishes are: St. Thomas, St. Andrew, St. Catherine, Clarendon, Manchester, St. Elizabeth, Westmoreland and sections of St Ann. From it’s data-gathering in the field, RADA reports that there are approximately 4564 hectares currently under production in these parishes. Of this amount 1606 hectares are being adversely affected by the prevailing drought. However, with the sparse levels of rainfall, the percentage reduction in crop yields currently ranges from as low as two (2) percent to a high of seventy (70) percent (Table 1). This stark variation in yields is to be attributed to the varying types of crops grown in the different parishes and their respective responses to the sustained lack of adequate water.

Table 1: Effect of Drought Conditions on Agricultural Production in Jamaica (2013)

Parish	Estimated Ha. under Production	Estimated Ha. Affected by Drought	Expected Yield (t)	Range Reduction in Crop Yield
St. Thomas	271.2	37.0	652.8	11 – 28 %
St. Andrew	246.6	30.1	379.18	2 – 51 %
St. Ann	370.4	130.3	1452.0	25 – 50 %
St. Catherine	301.3	159.4	1709.0	18 – 50 %
Clarendon	607.7	160.4	2656.74	10 – 30 %
Manchester	1,126.3	282.2	4080.4	25 – 70 %
St. Elizabeth	1,328.3	789.3	9644.1	29 – 40 %
Westmoreland	312.4	17.5	189.2	10 – 30 %

The Ministry of Agriculture and Fisheries and had put in place several programmes and initiatives to increase growth of the sector through attracting new investments and instituted an import substitution strategy for agricultural crops such as onion, Irish potato carrot, sweet pepper and tomato, that can be competitively produced locally. Such initiatives can be seriously jeopardized by the impacts of natural disasters, including drought resulting in failure to meet economic targets and negatively impact on the people livelihood.

Jamaica places a great effort in developing capacities of all vulnerable sectors in dealing with the impacts of climate change and natural disasters in a sustainable manner.

The country will soon have a comprehensive disaster-management policy which, among others things, will set out a medium- to long-term strategy to minimise the perennial effects of drought on the island.

Drought Monitoring and Early Warning System

A drought monitoring network was set through close collaborations of the Office of Disaster Preparedness and Emergency Management (ODPEM), the National Irrigation Commission (NIC) and the Water Resources Authority.

The Meteorological Service is responsible for monitoring, analyzing and archiving the rainfall records of Jamaica. Its Climate Branch maintains a rainfall network of nearly four hundred rain gauges and rainfall recorders located strategically across the island. From the information

collected the values for the island's drought Index are computed. This index is used to determine the onset, intensity and end of a drought in Jamaica. Monthly electronic Agromet Bulletins issued to assist stakeholders with information on rainfall and drought conditions.

In 2007 April, the Ministry initiated a Disaster Risk Management mechanism specifically for the agricultural sector.

Vulnerability Assessments

Jamaica is particularly vulnerable to the drought hazard because of the following reasons:

- As a developing country, Jamaica is particularly vulnerable to drought as we rely heavily on agriculture.
- Jamaica lies within the tropics and so we are dependent on more than one rainy season. A deficiency in any one season can produce a damaging drought.
- Predominant number of approximately 260 000 farmers in Jamaica are fall in the category of small, rain-dependent farms, with less than two (2) hectares in size.
- The increase in Jamaica's population due to urbanization, has led to a great increased demand for an already limited supply of water.
- Limited/poor national water storage systems.

Strategies Being Implemented by the Ministry of Agriculture & Fisheries to Address the Impact of the Drought

Owing to the localized nature of drought in Jamaica and the largely agricultural specificity of its impact, this hazard tends not to have the prominence of large-scale phenomena such as hurricanes and floods. However, recent drought events and associated wildfires especially in the agricultural bread-basket areas of southern Jamaica have focused attention on the need for a long-term strategy for drought-risk reduction. The Ministry of Agriculture and Fisheries is pursuing the following short to medium-term interventions:

Short-term Interventions:

- Training farmers and other stakeholders in efficient water management and land husbandry practices including mulching with the aid of plastic or grass liners to retain soil moisture, adding organic matter to soil to increase its water holding-capacity and establishing wind-breaks around fields

- RADA will continue to truck water to production areas where possible.
- Encouraging farmers to use efficient and economical irrigation systems where practical and as resources permit e.g. gravity drip systems, small portable pumps, tanks for water storage (black tanks);
- Encouraging farmers to plant seeds in trays instead of direct seeding in order to use available water more efficiently;
- Assisting farmers to improve their crop portfolio mix by planting drought-tolerant crops e.g. cassava, pineapple, sweet potato, gungo peas, ginger.
- Encouraging farmers to install temporary guttering systems to catch water from sporadic rainfall
- Exploring the rehabilitation of existing permanent water tanks in communities across the island;
- Sourcing funds to develop proposed irrigation schemes as outlined in the *National Irrigation Development Plan* prepared by the NIC.
- Increases in the level of production and the range of crops produced under protective cultivation
- Medium-Term Interventions:
 - Utilizing Geographic Information System (GIS) technology to cross-match key production areas with rainfall data for the last two (2) years areas, in order to better inform water management strategies for those locations
 - Determining the water availability in key production areas - The Ministry has asked the Water Resources Authority to identify available water resources and determine the capacity that can be used in key agricultural areas
 - Implementing *Rain Water Harvesting and Small-Scale Irrigation Projects* in Southern St Elizabeth - The Ministry is awaiting approval from the FAO for this project which will serve approximately 500 farmers and establish at least 20 demonstration rainwater harvesting systems (such as guttering and micro dams) and other appropriate technologies on small farms in that region
 - The Ministry's Research and Development Division and the Centre of Excellence for Advanced Technology will be working to develop drought-resistant varieties of crops that are suitable for Jamaica.
 - Conducting research on alternative crops that can be grown in greenhouses.

- Examining alternative storage mechanisms.
- Strengthening of multi sectorial approach to disaster risk management