

# Public Policies to address the water deficit and adapt agriculture to climate change

**The Guyana Experience**

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Hon. Noel Holder, Minister of Agriculture, M.P.

# Sustainable Agriculture in a Changing Climate, with emphasis on water

- ▶ resources to feed a world population of 9 billion by 2050
- ▶ agriculture in 2050 will need to produce almost 50 percent more food, feed and biofuel than it did in 2012.
- ▶ About 80% of this increased production must come from existing arable land through higher yields.
- ▶ By 2030, 40% global water deficit under the business-as-usual climate scenario.
- ▶ Groundwater provides drinking water to at least 50% of the global population
- ▶ 43% of all of the water used for irrigation.

- ▶ agricultural sector accounts for roughly 70% of all freshwater withdrawals globally,
- ▶ water consumption growing twice as fast as the global population,
- ▶ inappropriate use of fertilizers and pesticides has translated into water pollution, affecting rivers, lakes, aquifers and coastal zones.
- ▶

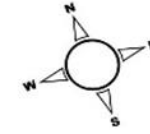
# Guyana

- ▶ The agriculture sector contribute over 16% to the economy.
- ▶ It is a sector that is crucial in terms of reducing unemployment, poverty alleviation and for bolstering economic development.
- ▶ With a land area of 83,000 square miles (~215,000 sq. Km)
- ▶ almost 90% of its population occupying a strip of land approximately 200 miles long and 30 miles in width (~10% of land area),
- ▶ 75% of the main economic activities concentrated on this low-lying coastal zone (red area on map)



- ▶ extreme weather events will increase in frequency and magnitude due to climate change- maximum probable (direct) loss of approximately US\$ 300 million from extreme events.
- ▶ extensive flooding in 2015 and 2017,
- ▶ drought conditions caused by the el *Niño* effect in 2016.

## Agricultural and Residential Land Use



Region  
2

Region  
3




Region  
4

Region  
5

Region  
6

Region  
10

### Legend

-  Residential Areas
-  Agricultural Areas
-  Administrative Regions

0 25 50 km



6

# Hydrometeorological Service

- ▶ Losses due to drought in 2016 : 33,231 acres in rice, sugar cane and cash crops; not forgetting losses in the livestock and fisheries sub-sectors,
- ▶ equivalent to a total loss of approximately US\$22.9 Million.
- ▶ risk management strategies for decision making based on preparedness (early-warning), mitigation (preventive measures) and adaptation (coping strategies) have to be developed with urgency.
- ▶ In Guyana, the Hydrometeorological Service, a department within the Ministry of Agriculture, is the legal entity responsible for the management of ground and surface resources. Service's functions include, but are not limited to the :
  - ▶ establishment, management and operation of national systems,
  - ▶ to monitor the availability, quality and use of surface and ground water resources,
  - ▶ and the establishment and maintenance of forecasting competence in water management.

Hydromet is responsible for Weather, Water and Climate Information.

# Hydrometeorological Service

- ▶ The Department is primarily involved in:
- ▶ **Assessments:** Monitoring for sector specific analysis and targeted impact studies.
- ▶ **Analogues:** analyses of historical trends for comparative studies (similar years on record).
- ▶ **Forecasts:** Early warning of impending episodic events affecting agriculture, such as flooding, drought, etc.
- ▶ **Outlooks:** Guidance for long-term/seasonal scenario analyses, including impact of climate extremes, variability and change.
- ▶ **Decision-Making Process:** Right information to the right user at the right time in the right format for informed decision making!



# Hydrometeorological Service

- ▶ Additionally, Hydromet is working to establish a National Water Information System (NWIS) which will provide a web-based platform for users to access water, weather and climate information anywhere, anytime in near real-time.
- ▶ Guyana, through support from our regional partners has also developed a National Vision Document for Water Resources Management, and continues to invest heavily in capacity development to improve the provision of national services in the area of water resources management.
- ▶ Guyana also recognizes the transboundary nature of many of the sources of its freshwater resources and is prepared to partner with our neighbours and sister agencies across our borders to ensure that regionally, water resources are managed in a sustainable manner.

# National Drainage and Irrigation Authority (NDIA)

- ▶ The National Drainage and Irrigation Authority (NDIA) is responsible for water resources management strategy and water use planning for the primary purpose of locating, evaluating, conserving and distributing water resources of the country for agricultural purposes.

# El Nino



# policies to adapt its agriculture to climate change and the potential water deficit

- ▶ Effective management of water conservancies
- ▶ Every major water conservancy along the coast has a management board that manages the use of the water. The East Demerara Water Conservancy (EDWC) serves to irrigate thousands of hectares of rice, sugar and other crops within Region 4 (which has 40% of total population of Guyana) by storing rain water for dry weather conditions and it also provides one of the primary sources of drinking water for the capital city of Georgetown. There are currently approximately 9 water conservancies along the Coastland.



- ▶ Promote and provide infrastructure for efficient use of water - Irrigation check structures to retain water for cash crop farmers while simultaneously providing controlled release of irrigation for rice farmers. It must be noted that construction cost irrigation are extremely costly, a 120 cubic feet per second pump station to supplement irrigation is approximately 1.5million USD. El Nino conditions put severe pressures on the irrigation system. In 2015/2016 El Nino, the lack of rainfall allowed salinity levels to exceed the minimum allowable. Water had to be pumped into the conservancies from rivers to supplement irrigation water.
- ▶ Promote agriculture in the interior of the country where lands are more resilient to climate change. Adaptation to climate change, in the Guyana context, involve extending our agricultural activities inland to higher ground.



# Irrigation Structure







- Concrete Ponds at Wowetta, trapping water from a spring in the mountain.



- Water reservoir being excavated in Rupertee for Cattle



- Water pond at Massara awaiting rainfall