National Trend Analysis - Climate change

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1.0 Current status

Mauritius is a small developing state in th Indian Ocean and similar to most Small Island Developing States,it has every reason toworry about the effect of climate change. Under the ageis of intergovernment panel on climate change,thousand of scientist among whom some mauritianhave been conducting research and have, with each major report, referred to the dangerof a business-as-usual attitude as far as climate is concerned.

According to the Mauritius Meteorological Services (MMS, 2009), the amount of GHG emissions is insignificant butitseffects on the environment areunavoidable and already palpable. Hence, to effectively monitor climatic changes, the Indian Ocean Commission (IOC) has developed climate change indices.

The objective of this paper is to present some of these climate change indices such as temperature and amount of rainfalls and look forward the future climatic trends in Mauritius.

2.0Temperature trend In Mauritius

The IPCC 2007 report underlined that the temperature of the Indian Ocean at a depth of 700 metres has warmed up and the temperature in Mauritius is increasing at a rate of 0.15˚C per decade (MMS, 2010). As shown in figure1, the average annual temperature at Plaisance show a definite warming trend. Most of the warming trend started as from the mid-seventies and the highest temperature recorded was in 2004 with an increase of 1.0˚C.

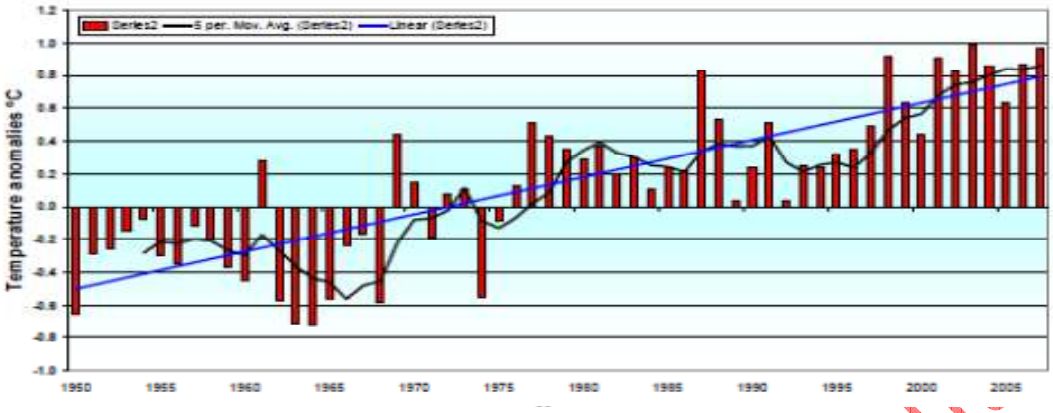

Figure 1: Mean annual temperature variation at Plaisance (Meteorological services, 2009)

As presented in figure 2, the regression clearly indicates an increase in temperature during the last 30 years with temperature ranging from 25.C to 28.C. Overall an increase of 0.13.C per 10 years is observed and it is expected that this trend is going to continue in the future.

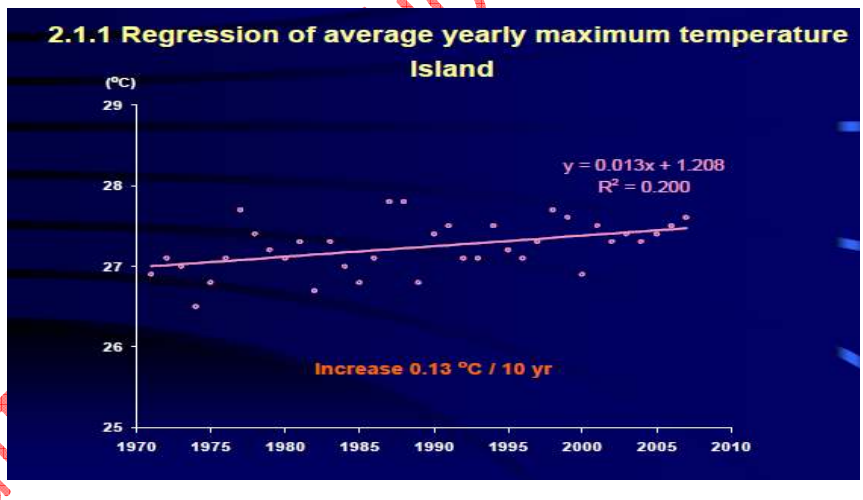

Figure 2: Time series data for average annual temperature over Mauritius (Nayamuth, 2009)

2.1Mean annual rainfall

Figure 3 depicts the time series of mean rainfall in Mauritius since 1905 to 2005. The regression lineindicates the decreasing trend in rainfall. This explains the severe drought occurs in year 1999 which affected the agricultural sector and hence forcing the whole country onto a regime of water cuts.

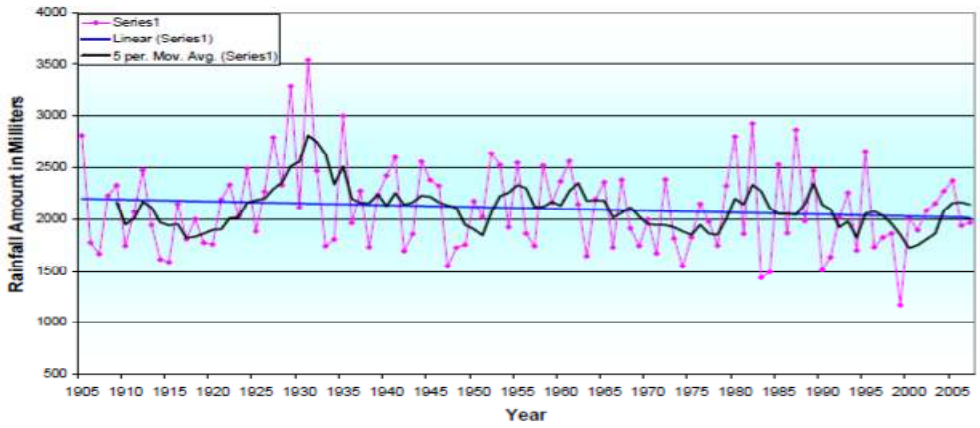

Figure 3: Mean annual rainfall over Mauritius (Meteorological service, 2009)

As shown in figure 4, theannual rainfall over the island is decreasing at a rate of 52mm per 10 years. In the 1950s, the annual rainfall was about 2600mm and this has decreased gradually to about 2000mm in 2010. According to the data retrieve from the trends in climate change indices in the republic of Mauritius, the precipitation indices show that the trends in rainfall are decreasing and so is the case for heavy precipitation events. Somehow, even if the number of rainy days is decreasing it has been found that heavy rainfall events leading to numerous flash floods and temporary interruption of certain socio-economic activities during the summer months of February and March hasfrequently occurred in the regions (MMS, 2010).

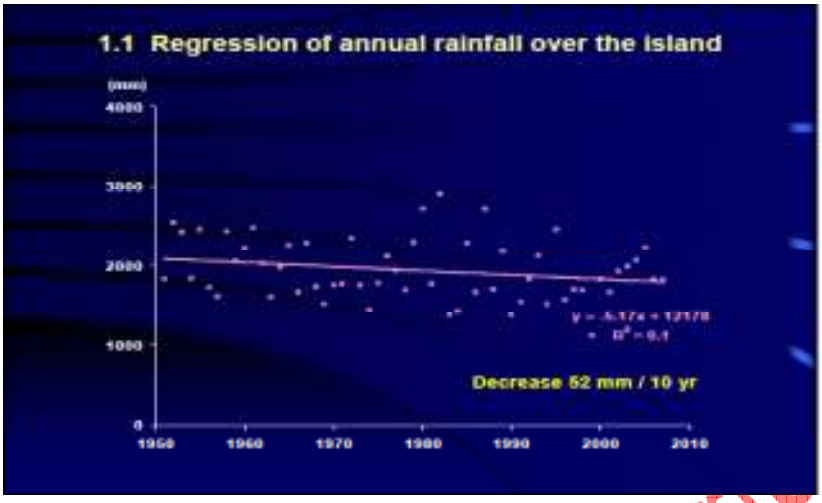

Figure 4: Time series data for average annual rainfall over Mauritius (Nayamuth, 2009)

2.2 Intense tropical cyclone

Figure 5, shows the increasing trend in the number of intense cyclone over the last 32 years (1975-2008). In 2001-2002 the cyclone season was exceptional; out of eleven cyclones, nine storms reached tropical cyclone strength. Similarly, in season 2006-2007, seven intense cyclones were recorded.

There exists two factors that drive the intensification of tropical cyclones and these are sea surface temperature and moisture content of the environment of the storm. Both of these factors have been observed to increase with climate change and global warming.

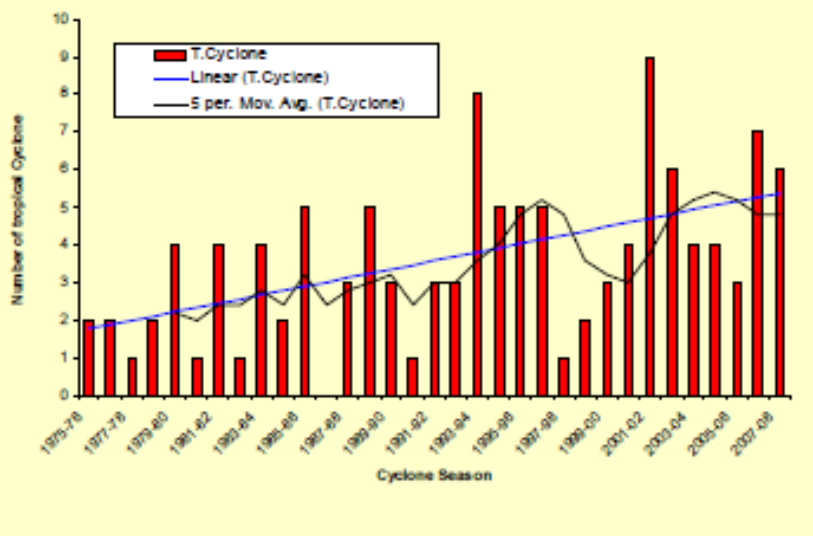

Figure 5: tropical cyclone over Mauritius (Nayamuth, 2009)

3.0 Outlook

Projected changes for Mauritius include:

• Increased acidification of the oceans caused by increasing carbon dioxide concentrations in the atmosphere;

• More frequent heat waves, and hotter summer months

• A rise in the number of heavy precipitation events

• Decreasing trend of 8% in annual rainfall

• Increase in the number of intense tropical cyclones

• The temperature is forecasted to rise in the range of 0.51 to 3.77°C and sea level rise between 18 and 59 cm by 2100.

4.0 Implemented Programmes

With the "Maurice Ile Durable" programme both public and private sectors are making efforts to integrate climate change in new developments strategies. In this respect, several programmes have been implemented namely:

1. A Climate change and sea level rise monitoring has been enhanced by increasing the number of automatic weather stations.
2. Installation of a new tide gauge at Agalega and another one at Blue Bay to monitor sea level.
3. Monitoring of the Sea surface temperature at Blue Bay as well as from ship reports in the Indian Ocean.
4. Development of an Inundation, Flooding and Landslide National Risk Profile, Strategy Framework and Action Plans for Disaster Risk Management.
5. Consultancy Services for Mainstreaming Climate Change Adaption in the development process in Agriculture, Tourism & Fisheries Sectors in the Republic of Mauritius.

5.0 Drivers and Inhibitors

- Drivers

Climate change will be driven mostly by a rise in temperature and GHGs emission due to human activity. Deforestation will also lead to climate change as it decreases the natural absorbing process of CO_2gas.

- Inhibitors

1. Development of appropriate tools for climate change mitigations & climate change adaptation.
2. Inbuilt climate change strategies in national development plan.
3. Implementation of quick and targeted climate change programmes.

REFERENCES

1. GOV,.Desertification/Land Degradation - Government of Mauritius. Online: Available: www.gov.mu/portal/goc/menv/files/desertification.doc(Accessed on 11st October 2011)
2. MAURITIUS METEOROLOGICAL SERVICE, 2010. *Climate change & sea level rise in Mauritius* [online]. Available from: http://metservice.intnet.mu/?cat=46 (Accessed 11st October 2011)
3. R.Nayamuth, 2009.*A drastic reduction in the renewable energy potential of the sugarcane.*[Online]. Available from: http://www.eci.ox.ac.uk/4degrees/ppt/2-4nayamuth.pdf(Accessed 11st October 2011)
4. Republic of Mauritius, 2009. *Climate change impacts on Mauritius.* [online] http://www.coi-ioc.org/fileadmin/multimedia_francais/centre_medias/dossiers_techniques/downloads/200903_Climate_Change_impacts_on_Mauritius.pdf(Accessed 16th October 2011)