Enhanced Socio-economic Benefits of Weather, Climate and Water Services

M. Beebeejaun
Deputy Director
Mauritius meteorological services

Dar Es Salaam, United Republic of Tanzania

21 February 2011

Contents

- -Multi Hazard system affecting the basin
- - approaches towards Cost-Benefit Analysis

Vision, Aim and Objectives

Vision

To make the Republic of Mauritius a Multi Hazard Ready Country.

Aim

To disseminate accurate and timely information on Multi Hazards to the population and the user Community

Objectives

To maintain an effective network of observation system both at sea, in the atmosphere and over land.

To have an efficient coordination among key stakeholders.

To conduct research on risks and impacts of Natural Hazard.

To identify vulnerable areas both along the coast and inland and preparation of evacuation plans.

To establish an up to date Mitigation, Education, Training and Public Awareness Campaign.

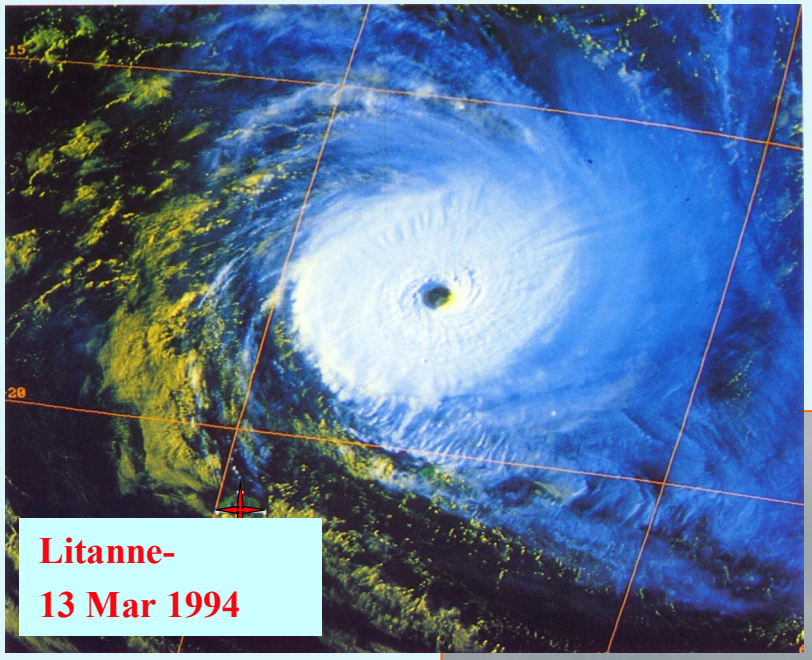
To provide an appropriate service for safety of life, protection of property and environment.

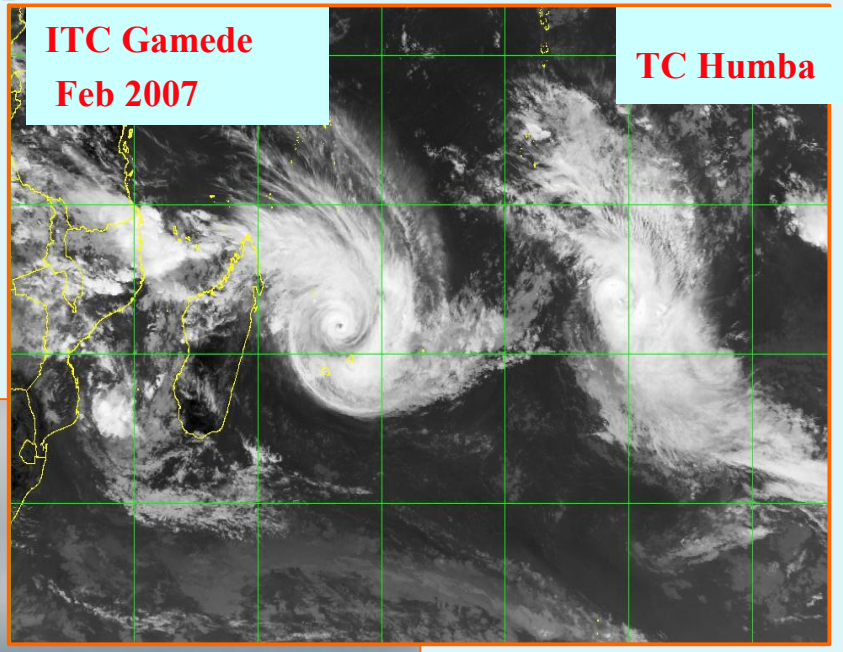
ORIGIN	PHENOMENA / EXAMPLES
Hydro meteorological disaster **Natural processes or phenomena of atmospheric, hydrological or oceanographic nature.**	• **Floods, debris and mudflows** • **Tropical cyclones, storm surges, wind, rain and other severe storms, blizzards, lightning** • **Drought, desertification, wild land fires, temperature extremes, sand or dust storms** • **Permafrost, snow avalanches**
Geological disaster **Natural earth processes or phenomena that include processes of endogenous origin or tectonic or exogenous origin, such as mass movements.**	• **Earthquakes, tsunamis** • **Volcanic activity and emissions** • **Mass movements, landslides, rockslides, liquefaction, sub-marine slides** • **Surface collapse, geological fault activity.**
Biological hazards **Processes of organic origin or those conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances.**	• **Outbreaks of epidemic diseases, plant or animal contagion and extensive infestations.**

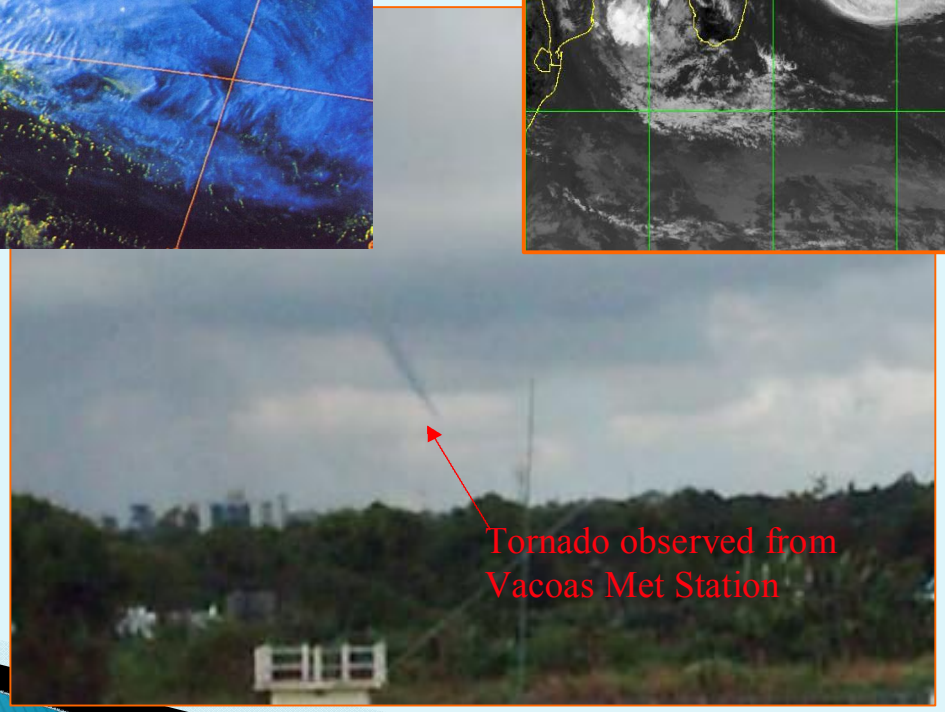
Multi-Hazards

- Cyclones
- Torrential Rains / Floods
- Tsunamis
- High Waves
- Water Spouts
- Tornadoes
- Droughts
- Landslides
- Butterfly

Some Snap Shots

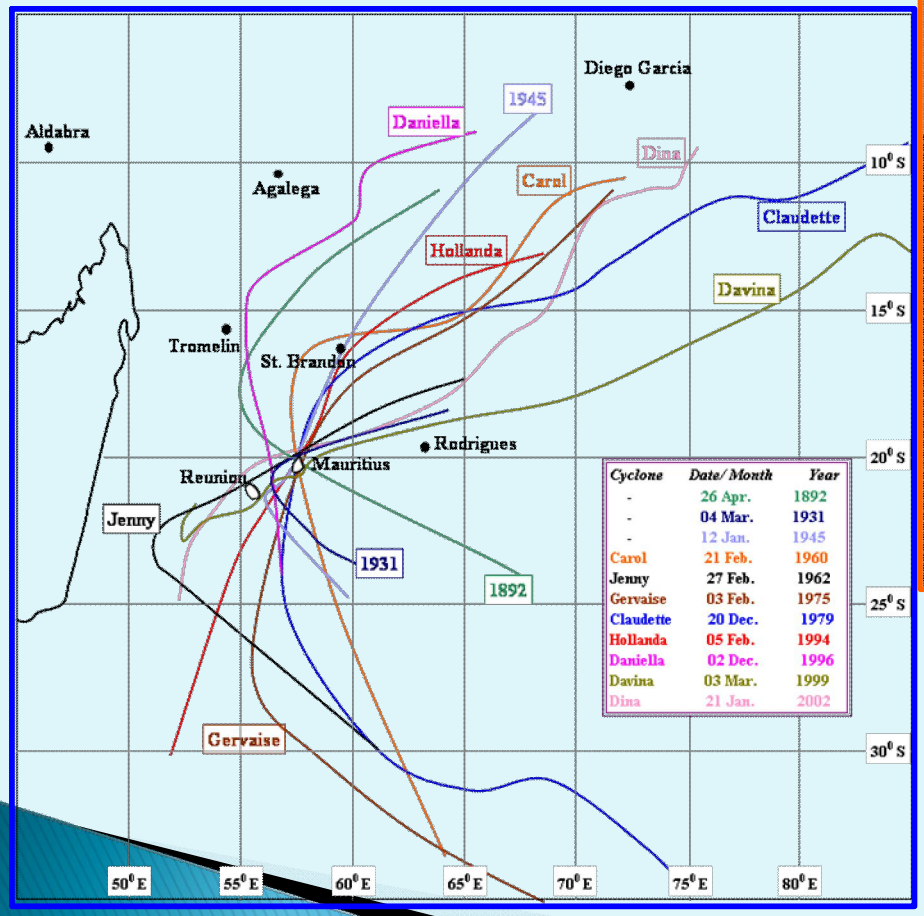


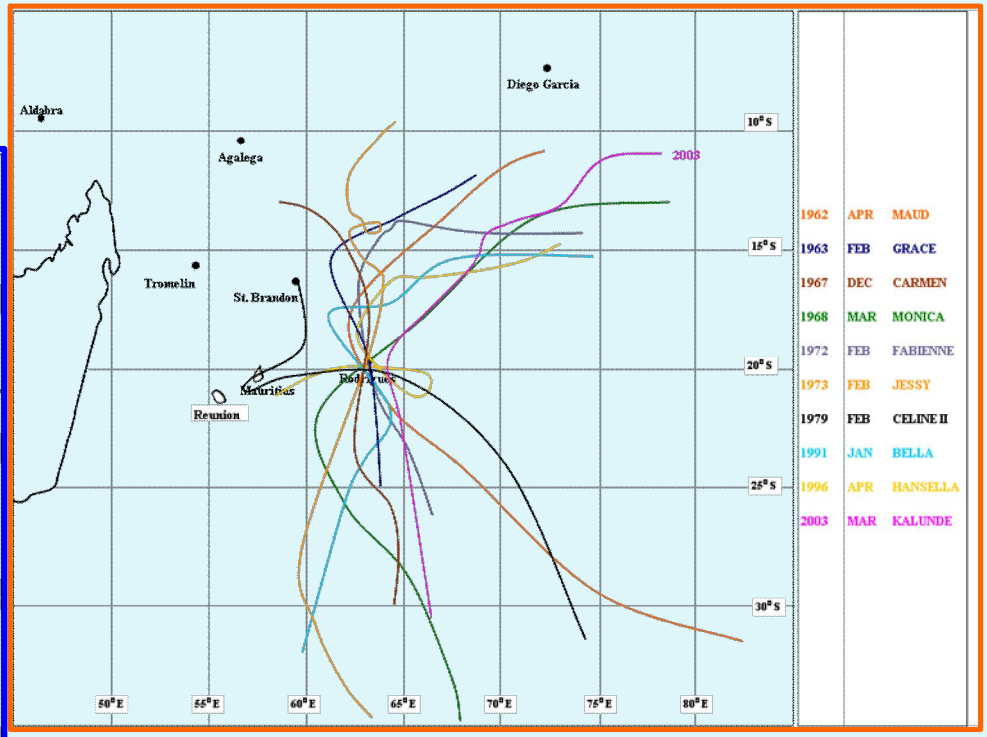




DIRECT HIT CYCLONES

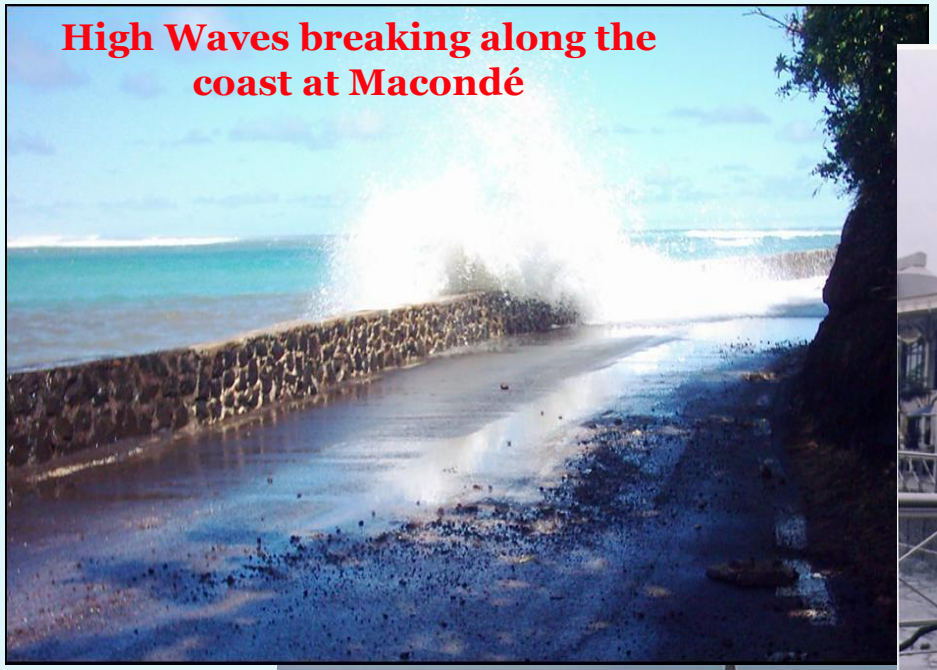
Mauritius





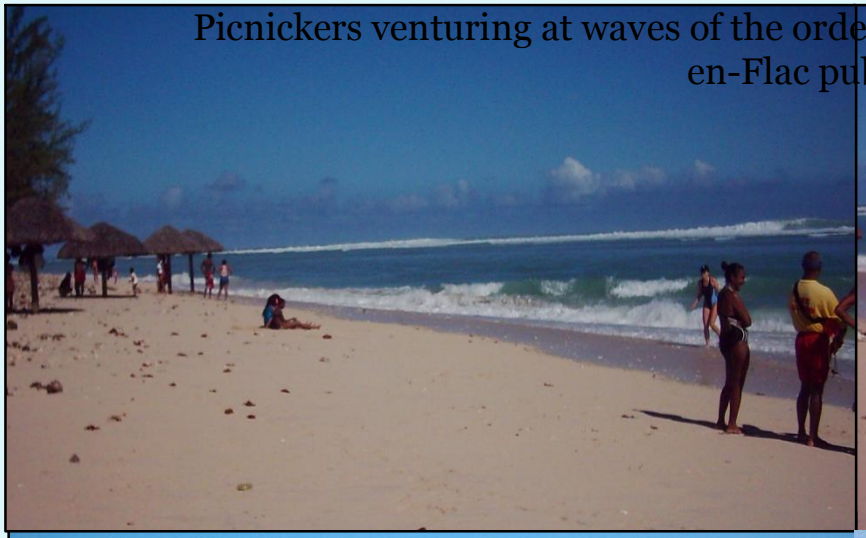
Rodrigues

Storm Surge



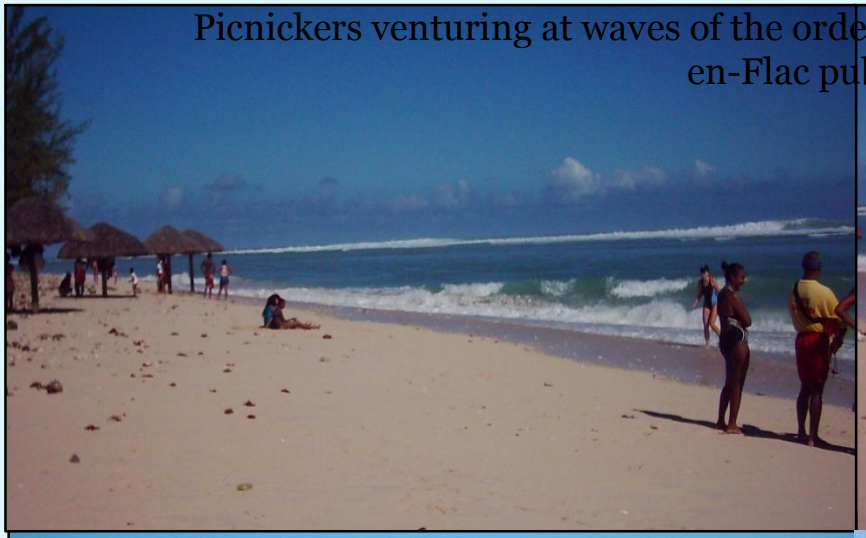
Swell Waves

Picnickers venturing at waves of the order of 2.5 metres inside the lagoon at Flic-en-Flac public beach



Swell Waves

Picnickers venturing at waves of the order of 2.5 metres inside the lagoon at Flic-en-Flac public beach

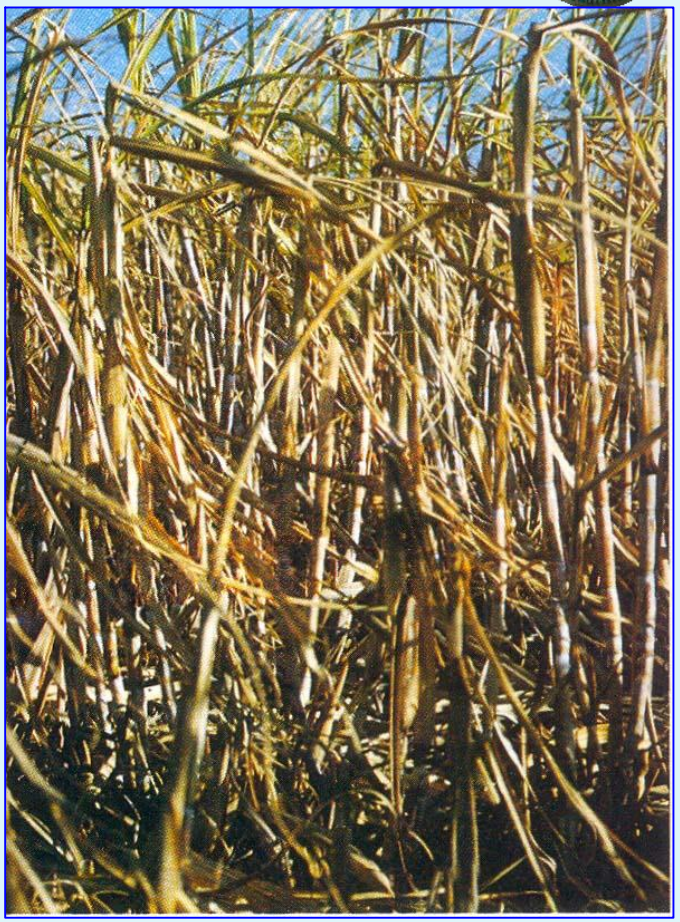


Field Inundation

Damages to Public Infrastructure

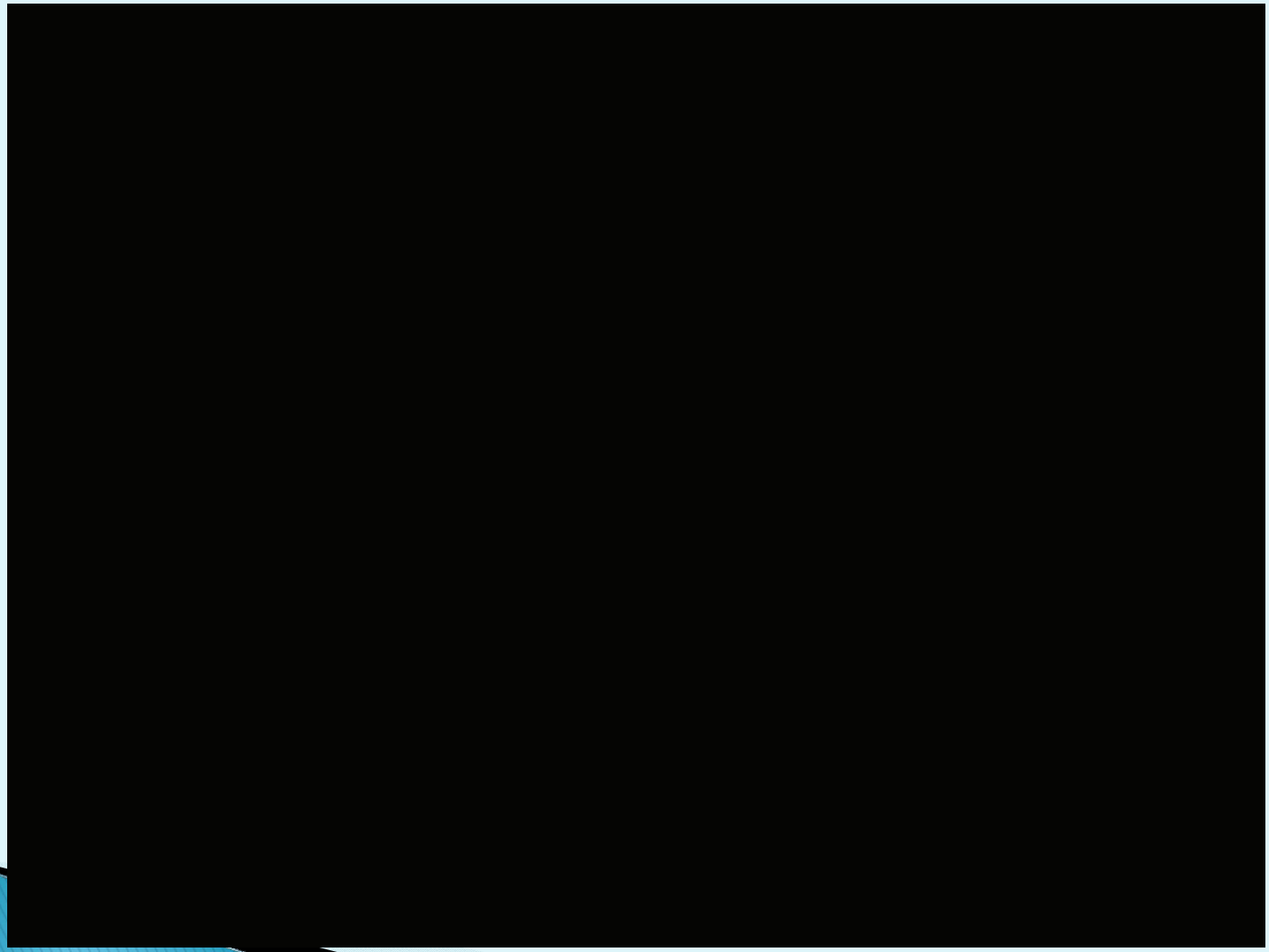
Road damages

DROUGHT



Designing and Construction purposes.

How A BUTTERFLY destroyed the roof of the neighbour



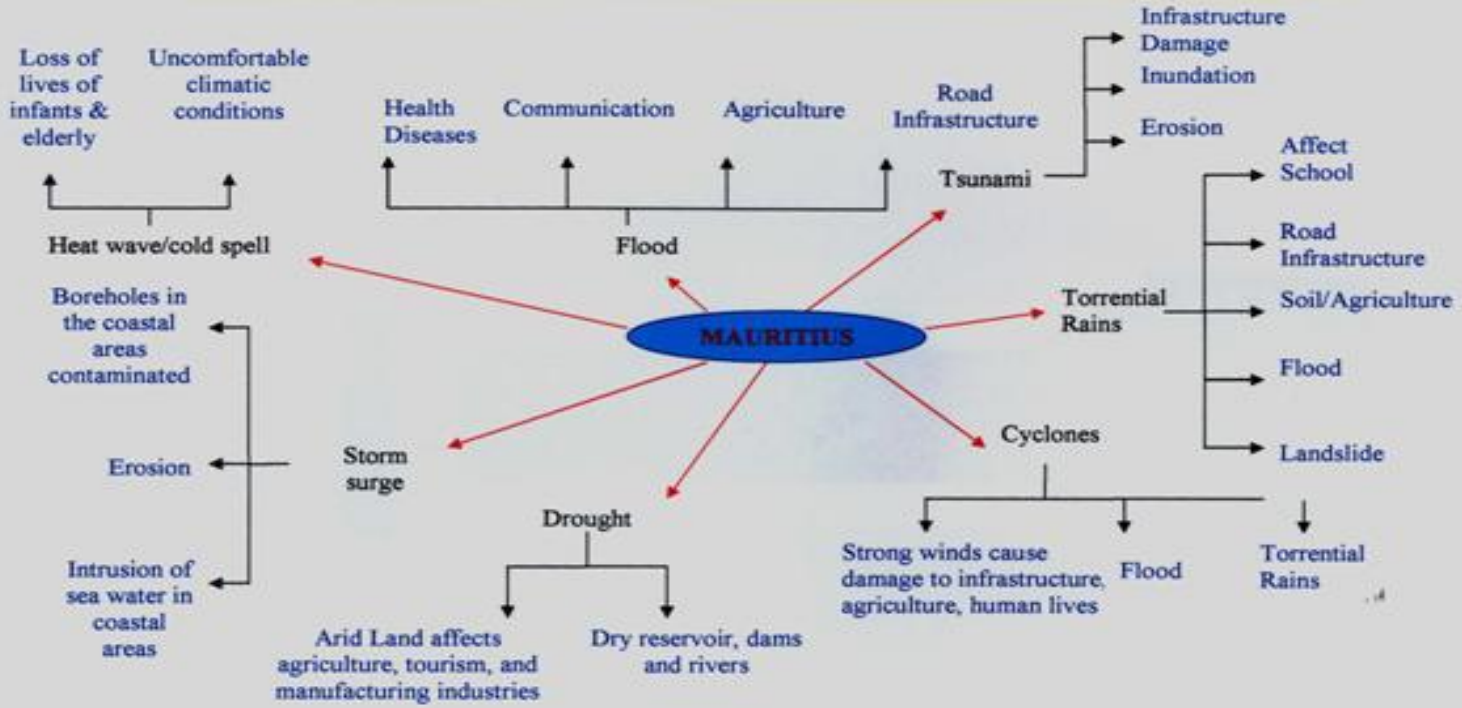
WEBSITE

Website: metservice.intnet.mu


TODAY'S
FORECAST

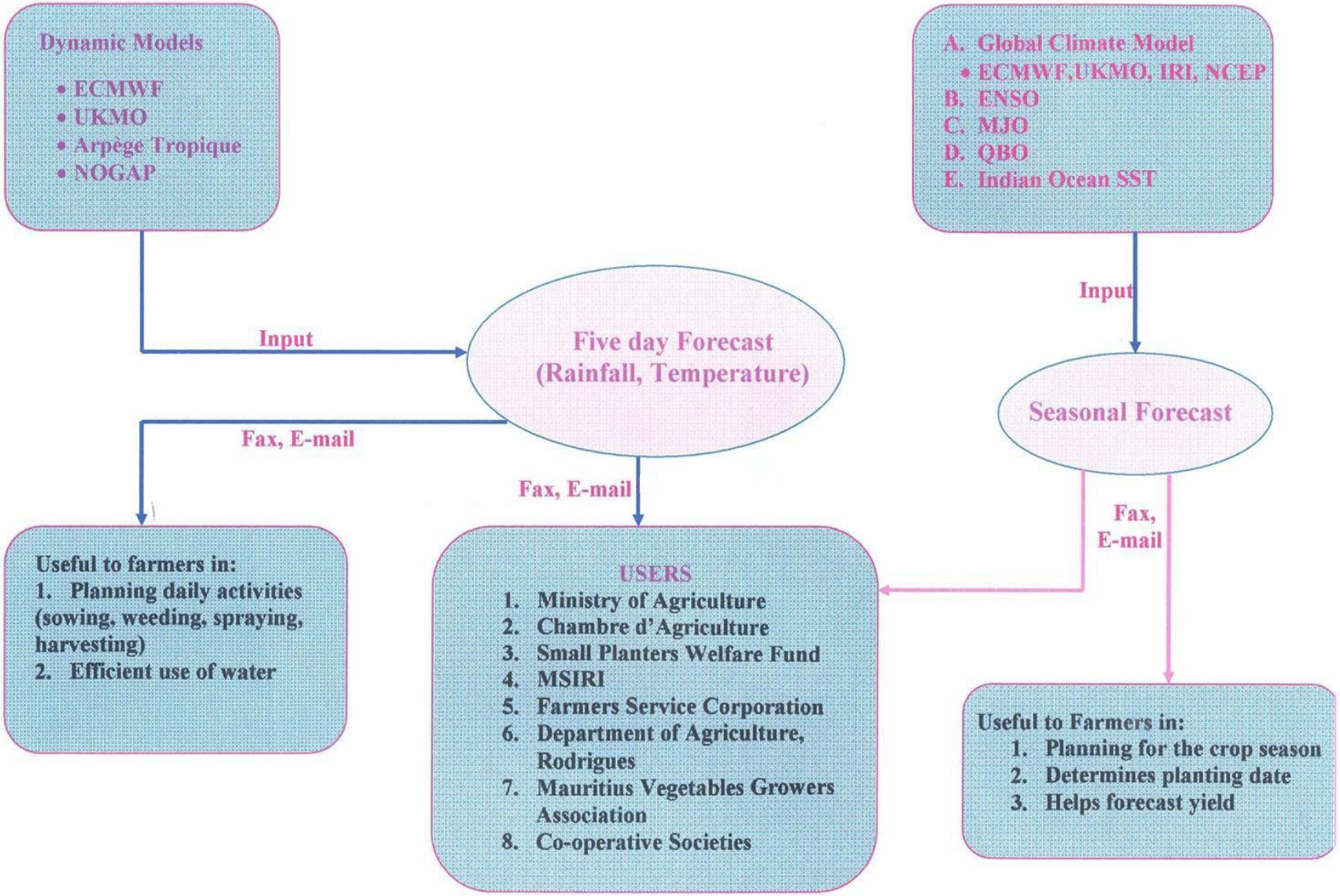

METEOROLOGY AND SUSTAINABLE DEVELOPMENT
WATER RESOURCES

Natural Disasters affecting Mauritius



Early Warning of these events allow decision makers to take appropriate steps towards mitigation

EARLY WARNING SYSTEM (AGRICULTURE)



Why?

Why do have to link MMS to Socio-economic issues?

Meteorology in Mauritius is perpetually changing ?

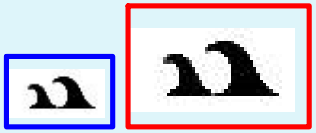
What are the reasons for this change?

Conclusions from 4th IPCC Assessment Report WG II: Impacts, Adaptation and Vulnerability

Phenomenon	Likelihood	Major projected impacts
Increased frequency of **heat waves**	Very likely	Increased risk of heat-related mortality
Increased frequency of **heavy precipitation** events	Very likely	Increased loss of life and property due to flooding, and infectious, respiratory and skin diseases
Area affected by **drought increases**	Likely	Increased risk of food and water shortage
Intense **tropical cyclone activity** increases	Likely	Increased risk of deaths, injuries, water- and food-borne diseases; Disruption by flood and high winds; Potential for population migrations, loss of property
Increased incidence of **extreme high sea level**	Likely	Increased risk of deaths and injuries by drowning in floods; Potential for movement of populations and infrastructure

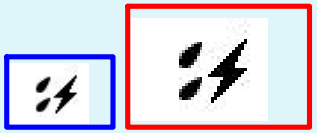
Increasing Risks under a Changing Climate

Strong Wind

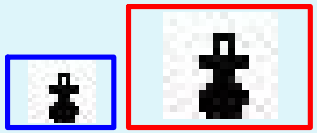


Coastal Marine Hazards

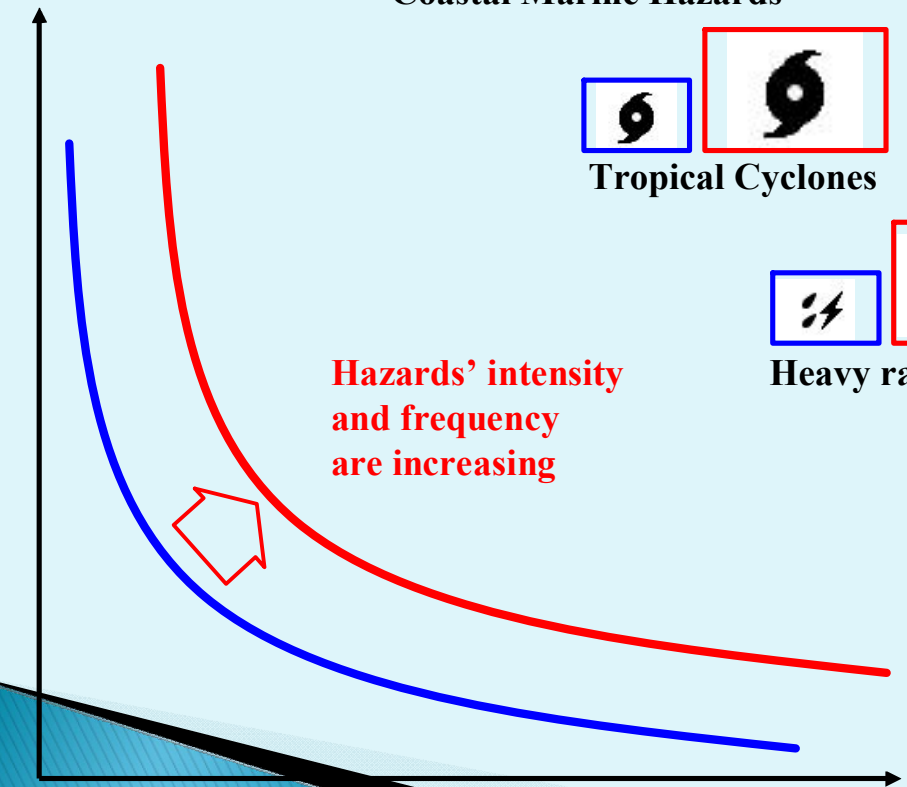
Tropical Cyclones



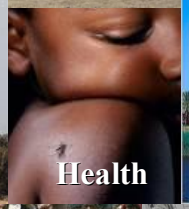
Heavy rainfall / Flood

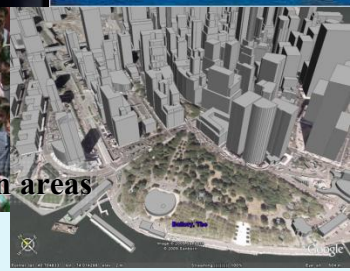


Heatwaves



Hazards' intensity and frequency are increasing





Exposure is increasing !

Need for disaster risk management

WMO Strategic Plan

Emphasizes enhancing the capabilities of Members to provide and use weather, climate and water applications

As meteorologists, we traditionally concern ourselves with scientific and operational aspects of the environment

Meteorology Evolution in Mauritius

Capacity building from WMO and other bilateral agreement and the national government emphasis on training has improved our understanding of the atmospheric processes that produce hazardous weather and related effects, climate variability and change

Better observations, particularly from space

Ability to interprete available models and generate forecasts extending to one week with a reasonable level of confidence

Meteorology Evolution in Mauritius

- New techniques availability such as Ensemble and probability forecast from world forecast centres
- Rapid dissemination and communication tools
- Set up a robust network at the national, regional and international level

How does the evolution of the MMS in the field of atmospheric science and related technology benefits the society and economy?

Presentation (GIS), camera, live teleconf with media, higher precision, longer range forecast for planning purposes

Expectations of the society?

MMS MUST be at the forefront of almost all natural hazard and addressing a wide range of weather, climate and water-related issues that affect human life, socio-economic development and the environment

How do we proceed?

- Providing an efficient Service Delivery
- Leadership, contributions, and visibility of MMS
- Show unrealised economic and social benefits acquired by adopting MMS contribution.
- Build up capacity to meet a wide range of user need
- Network and collaborate with other relevant partners and organizationS
- Use available resources according to National priority.

Services delivery

Identify , know and open dialogue with user community

New ways of delivering services through partnerships: all partners responsible for the decisions made to utilize environmental information

Disaster management Centre just came into operation

Leadership

MMS is able to integrate its services into the national decision-making processes. (Long Range Forecast, Early Warning system, Climate change and Climate variability and sea Level rise scenarios, Return periods of events etc)

Provide timely, well formulated, relevant and well presented information and advice especially on high impact and severe weather, and climate to the decision makers and the public

Addressing Socio-Economic Aspects

MMS contributes to the economic and social problems and priorities of the country. It ensures that its priorities are taken on board in the national budget speech (MID, setting up a marina or a public beach)

To convince the economist the MMS uses the "language of economists" which is not too easy. (AWS, with SOLAR sensor)

Translate the work of the MMS into ways to contribute to solving the economic and social problems (waves Impacts are eroding the beaches, a source of recreation for tourist and local population, sea warning for fishermen, Spraying of pesticides from low flying aircrafts, etc)

Addressing Capacity Building and Modernization Challenges

- Modernize the MMS as far as possible to take advantage of scientific and technological advances
- Build the capability of the staff to use these advances to produce better products, but
- Also how to communicate them and provide better services

Budget Organization

Perpetual shrinking budgets of MMS

Government budgets not sufficient to the needs of MMS in fulfilling mandate

The partnerships with relevant ORG

MOE&SD (waverider buoy) , MPU (solar Radiation sensors), MOI (research on tsunami), IOC (transmet, synergie), JICA (radar)

Revenue Generating Institution

- Govt Support: 60M
- Aviation: 16m
- Sale of data: 2M
- Future Projection:
- Aviation: 18M
- Sale of data to companies and other private org: 3m
- Going towards client (hotels, tourist, farmers, maritime Navigation, Ministries, abt 10m In 5 years)

Conclusion

MMS has left the traditional disciplinary and is urged to generate socio-economic flavoured products

MMS present and communicate weather information to meet the users' needs (Help from media)

THANK YOU