Climate Change – Impacts on Mauritius

Greenhouse gases have a crucial role in bringing about global warming –the atmosphere, the ocean and indeed the earth systems. In turn the warming of the earth atmosphere system has implication for acceleration the atmospheric engine with marked changes in the weather patterns, the expansion of ocean and the melting of glaciers causing the sea level to rise and the impact on life forms.

Synopsis•

- Difference between weather and climate
- How people live in different climates and the impacts of climate on human activities
- Factors that contribute to change of climate
- Greenhouse effect and global warming
- Some examples of greenhouse gases
- The possible impacts of global warming•
- Willingness to change some energy-use habits for more environmentally friendly ones

Difference between weather and climate

Weather is the current state of the air around us. It can be described by conditions of temperature, wind, rain, clouds, humility and air pressure.

Climate is the long-term average of weather conditions for an area for a longer period (30 years or more) Climate change is a more permanent change of climate from one mode to another. Since the world was formed (about 4600 million years ago), climates have been changing, sometimes cooling down and sometimes warming up. Climate is changing right now.

Climatologists study the causes and effects of climate change. A few factors that influence these changes include:

Changes in concentrations of certain gases (also known as greenhouse gases).

The Earth's position in relation to the sun)

Changes in ice and snow covered)

Volcanic activity

The natural greenhouse effect

The Greenhouse effect describes what happens when sunlight (short-wave radiation) enters the atmosphere and heats the Earth's surface. The Earth re-radiates the same amount of energy it receives, back into space in the form of heat (long wave-radiation). This radiation passes through the earth's atmosphere where some of it is absorbed and re-emitted in all directions by certain gases known as greenhouse gases. The gases include carbon dioxide, carbon monoxide, methane and others to a lesser extent. This results in a natural warming of the Earth's surface. The world average temperature is about 14ºC. The average since the 1880s is given in the graph. It is on average about 30°C warmer due to the presence of greenhouse gases. This warmth is vital for life on Earth. It is essential for humans and other organisms to survive.

Human-induced greenhouse effect

Human activities such as agriculture, burning of fossil fuels and manufacturing are increasing the amount of some of these greenhouse gases in the atmosphere. The most important of these gases is carbon dioxide. Another gas emitted from agricultural activities is called methane. Other forms of greenhouse gases are emitted from the exhaust of vehicles burning fossil fuels. As these gases absorb and emit more of the sun's energy, a larger amount is trapped in the atmosphere.

Global average decadal temperature of the Earth atmosphere in ºC

The result is an increase in the Earth's average surface temperature, including the lower atmosphere, the land surface and the oceans, lakes and surface water bodies. The phenomenon is known as global warming, which in turn causes changes in climate.

Impact of climate change

Even a small rise in temperature will cause a change in the climate.

- Changes may occur in cyclone intensity, wind patterns, rainfall distribution and cloud cover.
- Some places may become drier and other will be affected by increased flood conditions.
- The sea level will rise with the destruction of beaches, buildings and leisure facilities near the coast.
- It will get hotter by day and night with impact on health and vegetation. For example, the temperature inside a car left in the sun with the windows closed is unbearable and has been known to cause the death of children. The temperature in glass houses is also warmer than outside. The increased warming is due to heat trapped by the glasses which allow the direct rays from the sun to penetrate the car or the glass house but are unable to leave as the rays become weaker on contact with the bodies inside.

Climate Change Mitigation

This refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. It can be as complex as a plan for a new city or as a simple as improvements to a cook stove design. Efforts underway around the world range from high-tech subway systems to bicycling paths and walkways. Protecting natural carbon sinks like forests and oceans or creating new sinks through silviculture or green agriculture are also elements of mitigation (UNEP).

The case of Mauritius

As a Small Island Developing State (SIDS), Mauritius is among the countries that will be most affected by climate change. The Mauritius Strategy (2005) recognized that climate change would adversely impact on the sustainable development in SIDS. IPCC's Fourth Assessment Report (2007) states that sea level rise may aggravate inundation, storm surge, erosion and other coastal hazards and freshwater availability. In this context, Mauritius has set the "Maurice-Ile Durable", which aims to ensure a sustainable island.

Several mitigation and adaptation strategies have been adopted aimed at safeguarding the economy have been adopted. In the energy sector, a policy is being developed and some resources have been devoted to renewable energy sources –solar water heaters, solar power, and subsidy to economy bulbs. Other actions include:

a) The Environment Protection Act 2002, amended in 2008, is the main legislative framework for environmental protection and sustainable development.

b) Integrated five-year national programme on sustainable consumption and production for Mauritius

Some observed impacts of climate change in Mauritius

Between 1998 & 2007, local mean sea level rose by 2.1mm per year

- Decreasing trend in annual rainfall of around 8% over Mauritius since the 1950s
- Average temperature has risen by 0.740C when compared to the 1961-90 mean
- An increase in the annual number of hot days and warm nights
- More frequent torrential rains resulting in flash floods
- Increase in the frequency of extreme weather events, heavy rains and storms.

Projected impacts of climate change in Mauritius

Decreasing trend of 8% in annual rainfall

- Increase in heavy precipitation events with increased risk of flash flood
- More frequent heat waves in summer
- Milder winters
- Increase in the number of intense tropical cyclones
- Increase in duration of dry spell
- Increase events of high energy waves (tidal surge) impacting the shores of Mauritius (Source: Mauritius Meteorological Services)

ADD's contributions to mitigation and adaptation

ADD has been undertaking activities that contribute to mitigation and adaptation. Its actions relate to:

- Plantation of mangrove (up to 5 ha) at Le Morne, Poudre d'Or and Quatre Soeurs to enhance biodiversity, protect the coasts from further erosion and to serve as a sink for carbon dioxide
- Building hard structure to arrest coastal erosion
- Establishment of Nature Corner with indigenous, medicinal, flowering plants and with herbs, fruit trees and vegetables
- Sensitisation of school children, women, elderly, fishers and youth on sustainable development issues such as measures to save energy and water
- Upgrade a historical site