CLIMATE CHANGE: A MAJOR THREAT TO BIODIVERSITY

What is Biodiversity?

Biodiversity or biological diversity is the variety of species, their genetic make-up and the ecosystems in which they interact.

Importance of Biodiversity

- Biodiversity is extremely important to people and the health of ecosystems. It provides us with:
  - Foods and materials;
  - Pollinators for our crops;
  - Breeding stock for agriculture and livestock;
  - Income for us and our country;
  - Medicine to prevent and cure diseases and lengthen the human life span;
  - Recreation and inspiration for people;
  - Opportunities for research in new areas;
  - Sustaining cultural practices; and
  - Ecological services such as:
    - Removal of pollutants (from water, air and soil);
    - Providing oxygen for us to breathe;
    - Recycling of plant nutrients;
    - Climate stability; and
    - Resilience to severe disturbances e.g. fire, floods, diseases.

It is genetic diversity that prevents diseases from completely destroying a species and helps them to adjust to changes in their environment. Without it, species would perish and become extinct.

What Can I do?

Reduce your Carbon Footprint: Lower your individual carbon emissions by:
- Using energy efficient lights, appliances and transport;
- Reducing, reusing and recycling where and as far as is possible whatever you buy, consume or throw away; and
- Purchasing locally produced products as much as is possible.

Protect Biodiversity: Reduce your impact on biodiversity by:
- Purchasing only products produced in a sustainable manner; and
- Learning more about climate change and the issues affecting biodiversity.

Act for the Environment: Acting on what you know would safeguard the environment:
- Plant a tree;
- Organize a clean-up activity in your school or neighbourhood;
- Make and manage a compost heap; and
- Encourage others to learn more about the environment and climate change.

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What is Biodiversity?

Importance of Biodiversity

Direct impacts include:
- Habitat loss/degradation;
- Over-exploitation (such as overhunting and overfishing);
- Spread of non-native species and diseases.

Indirect impacts include:
- Climate Change; and
- Pollution.

Threats to Biodiversity

Extinction occurs naturally, when there are natural shifts in the environment over long periods of time, such as the ice ages. However, today, species are going extinct at an accelerated and dangerous rate, because of non-natural environmental changes caused by human activities. Some of these activities have direct and indirect impacts on biodiversity and ecosystems.
Climate Change

Climate Change is the result of significant increase in the warming of the Earth's surface and lower atmosphere that is causing many other changes, e.g. extremes in rainfall, drought and floods. Greenhouse gases such as, carbon dioxide, water vapour and methane normally trap heat in the atmosphere thereby, keeping the planet warm. However, in recent decades, due to human activities such as use of fossil fuels, farming, and land-use changes, the amounts of these gases in the atmosphere are increasing causing it to become warmer.

Globally, Climate Change is affecting biodiversity and leading to negative consequences for human well-being. Notably, biodiversity, through the ecosystem services it supports, makes an important contribution to both climate change mitigation and adaptation. As such, it is necessary to conserve and sustainably manage biodiversity to address climate change.

Impacts of Climate Change on Biodiversity

Climate Change is already having an impact on biodiversity and it is projected that this threat could get worse, unless, the efforts to combat it are strengthened on a global scale. Some specific impacts of Climate Change are:

- **Melting of Polar Ice-Caps** – Loss of arctic ice-caps and consequent rising sea-levels threaten biodiversity across the entire Arctic tundra biome and beyond.
- **Ocean Acidification** – Warmer temperatures and higher concentrations of carbon dioxide in the atmosphere are making the oceans acidic. This is reducing the ability of marine life to thrive and is causing coral bleaching. Coral reefs are becoming less productive causing an imbalance in marine food chains and a lowering of the amount of oxygen available for marine life.
- **Forest Decline** - Changes in water availability and temperature associated with Climate Change could lead to higher incidence of forest decline. These conditions could make some forest species more vulnerable to disease and overwhelmed by competition as they are less suited to the changing conditions.
- **Extreme Weather Events** – More frequent and intense weather is associated with Climate Change. Consequently, there would be higher incidence of floods and droughts.
- **Increase in Incidence of Diseases** – Higher temperatures will increase the range of pests and vectors as they find hospitable conditions in wider areas. Plant distribution and diversity, will also be affected, since plants will be forced to shift because of changes in water availability and temperature. In these new areas, they may not be as resilient to diseases as they were in their original habitats.
- **Food Shortage** - Harsh weather conditions and ecosystem changes influenced by Climate Change can affect agricultural biodiversity with consequent lowered productivity and food availability.
- **Species Loss** - As species fail to adapt quickly to Climate Change, many will perish. With this loss, the potential for new cures for diseases and higher and more resilient agricultural food production would be reduced.

Addressing Biodiversity Loss due to Climate Change

Climate Change is a reality and has become the focus of attention locally, regionally and globally. At the global level, the issue is being addressed primarily under the United Nations Framework Convention on Climate Change (UNFCCC). Threats to biodiversity on the other hand are being addressed by the United Nations Convention on Biological Diversity (UNCBD). Many countries have signed on to and have ratified these Conventions.

Generally, countries are employing two major strategies, namely, mitigation and adaptation to address Climate Change. Mitigation strategies seek to reduce the release of greenhouse gas emissions in order to reduce the effects of global warming, while, adaptation strategies focus on reducing the vulnerability of natural and human systems to the effects of Climate Change.

Common mitigation and adaptation measures are:

**Mitigation Measures**
- Practicing/Implementing Afforestation and forest conservation;
- Developing Low Carbon Development Strategies (LCDS); Guyana’s LCDS seeks to acquire payments from developed countries for keeping our forest intact, since the forest acts as a sink for carbon dioxide;
- Improving energy efficiency and conservation;
- Putting an economic value to biodiversity;
- Reducing influx of Invasive Alien Species - species may enter a new habitat as a result of trade, travel, transport or tourism and may out-compete the native organisms for food and space;
- Planting of mangroves to help buffer the impacts of sea level rise and harsh weather patterns;
- Implementing energy efficient technologies;
- Practicing/Implementing Afforestation and forest protection;
- Developing climate-smart agriculture - e.g. the use of savannah lands; hydropic method of farming and developing crops which are resilient to floods;
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- Developing climate-smart agriculture - e.g. the use of savannah lands; hydropic method of farming and developing crops which are resilient to floods;
- Implementing Ex situ Conservation;
- Practicing Farmland irrigation;
- Instituting Forest Pest Control;
- Implementing Species Translocation (moving species from hostile environments in the wild to more conducive environments);
- Improving infrastructure such as flood barriers; and drainage and irrigations systems;
- Improving education and awareness;
- Improving institutional capacity and efficiency; and
- Improving livelihoods.

**Adaptation Measures**
- Providing alternative livelihood activities for hinterland communities; and
- Promoting the use of alternative energy sources.