

CLIMATE CHANGE

Climate change refers to the shift in global temperatures and precipitation overtime. It is a long term alteration in the weather patterns especially temperature and storm activity. In other words it is the man made or natural shift in average atmospheric conditions overtime.

The basic cause is the human activities that emit green house gases (GHGs) into the atmosphere that then lead to global warming. The common GHGs include carbon dioxide (CO₂), Nitrous oxide (N₂O), Methane (CH₄), HydroFluoroCarbons (HCFs), Perfluorocarbons (PCFs), sulphur hexafluoride (SF₆), Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs) and Halons.

According to research, the last decade of the 20th Century and the beginning of the 21st Century have been the warmest period in the entire global instrumental temperature record, starting in the mid-19th Century. Assessment reports conclude that this increase in the globally averaged temperature is very likely due to the observed increase in anthropogenic green house gas concentrations.

Indicators of climate change

- (a) Unreliable (Irregular) and little rainfall being received.
- (b) Changing seasons of rainfall.
- (c) Increasing temperatures in originally cool regions.
- (d) Frequent floods from heavy rain storms.
- (e) Drying grass and stunted tree growth in formerly wet areas.
- (f) Rising sea levels because of thermal expansion and deglaciation.
- (g) Shrinking of glaciers or ice caps e.g. by 4.92 feet in 2006.

Causes of climate change

Man's environmentally unfriendly activities that cause climate change include the following:-

- Deforestation/devegetation i.e. increases CO₂ emission. Deforestation reduces the role of trees as carbon sinks.
- Bush burning of i.e. produces N₂O and CO₂.
- Burning of fossil fuels like petrol, diesel etc. in motor vehicle engines produces CO₂ in the exhaust fumes.
- Wet land destruction/reclamation – produces more CO₂ and CH₄.
- Industrial activity and transportation i.e. produces CO₂ etc.
- Poor agricultural practices produce CO₂ and N₂O.
- Land degradation produces CO₂.

- Poor waste management/disposal e.g. landfill with waste produces Methane and burning waste produces CO₂.
- Mining and quarrying i.e. destroys the vegetation.
- Borehole drilling – tends to reduce on the water table that is a source of water for the vegetation.
- Large numbers of livestock or animals release methane into the atmosphere through their dung.
- Use of chemical fertilizers that generally contain nitrogen. These release N₂O into the atmosphere.
- High rate of population increase leads to more deforestation, waste generation, more burning of fossil fuels etc.
- Paddy rice growing produces a lot of methane (CH₄).
- Wars/political strife or conflicts leads to destruction of vegetation etc.

Effects of climate change

- Water shortage due to drying of water sources.
- Famine and malnutrition due to failure and death of livestock.
- Displacement of people – migration and incursions due to floods, landslides, droughts.
- Frequent floods resulting into destruction of life and property.
- Increased storm activity and cyclones become more intense due to the fact that oceans become warmer and with humid atmosphere.
- Diseases e.g. Malaria in Kabale, Cholera due to floods and respiratory diseases due to dust storms in times of drought.
- Loss of biodiversity i.e. threat to wild life.
- Soil erosion and Land degradation e.g. at river banks.
- Lowering of water levels e.g. Lake Victoria resulting into H.E.P production problems.
- Encroachment on wetlands.
- Eutrophication – oxygen depletion resulting into loss of aquatic life like fish.
- Shrinking of ice caps/glaciers.
- Changing patterns of rainfall.
- Unreliable/little rainfall being received.
- Conflict over pasture land and water sources for the cattle as well as increases cases of cattle rustling.
- Conflict with neighbouring countries over the reducing levels of Lake Victoria, the river Nile e.g. with Egypt and Sudan i.e. Potential Insecurity.

- Drying grass and stunted tree growth in formerly wet areas.
- Rise in ocean/sea levels due to thermal expansion and duplications resulting into floods in coastal areas.
- Pollution of water sources.
- Wild forest fires because of the hot weather conditions that make tree branches and leaves on the forest floor to become drier.
- Salt-water intrusion or salinisation at coastal areas due to rise in sea level.

Adaptation measures/activities:

Actions or adjustments to cope with climate change effects in East Africa include the following:-

- Sensitization of the community on climate change and capacity building for resilience in schools, churches, communities etc.
- Tree planting/afforestation and forest or wildlife protection
- Rain water harvesting.
- Construction of water reservoirs/dams and community ponds for irrigation.
- Conservation of the available water resources – behavioural change towards water use.
- Planting different crops and those that are tolerant to drought i.e. adaptation to agricultural production suited to changed weather patterns.
- Diversification of livelihoods for alternative incomes in case of disasters.
- Land degradation management.
- Enhanced disease and pests monitoring and control.
- Recycling and reusing waste where possible/proper waste management.
- Adoption of energy saving technologies thru research.
- Use of indigenous knowledge e.g. in food preservation or grain storage.
- Establishment of demonstration farms to train farmers on improved farming techniques.
- Integration of climate change into research, development plans and budgets etc.

Mitigation activities:

The causes of climate change can be reduced by preventing/reducing on the emission of greenhouse gases. This can be through the following:

- Tree planting/growing (afforestation /reforestation and agro-forestry).
Planting more trees in urban areas.

- Energy efficiency and energy saving technologies e.g. energy saving stoves, construction of well ventilated houses.
- Use of renewable/alternative energy: HEP, wind energy, solar, biogas etc.
- Changing the transport mode i.e. using vehicles that are more fuel-efficient and use of public transport such as buses, trains etc. or cycling.
- Route and road construction planning.
- Wetland conservation e.g. bye-Law enforcement.
- Avoiding deforestation and forest degradation.
- Proper waste management e.g. compositing and re-using or recycling of waste
- Stopping the use fire as way to clear land for farming.
- Using less fertilizer and adopt better feed mixtures for livestock.
- Population control through family planning and information reproductive health.

Exercise

Explain the following terms as used in the science of climate change:

- a) Carbon impact
- b) Carbon sink
- c) Carbon trade
- d) Carbon Credit
- e) Carbon Footprint
- f) Ecological footprint
- g) Greenhouse effect
- h) Global warming
- i) Ozone hole
- j) Climate variability
- k) Climate change vulnerability
- l) Climate change adaptation
- m) Climate change mitigation