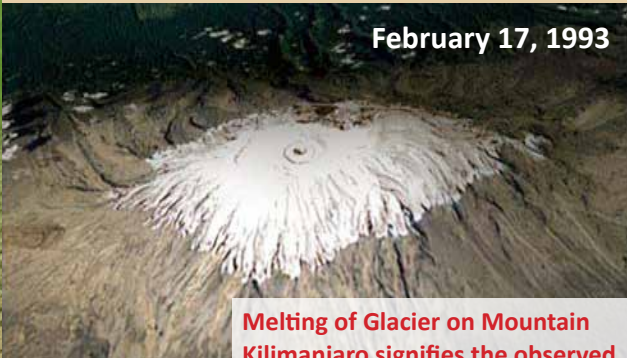


- ✓ Providing sufficient education and awareness to communities on environmental conservation and protection of water sources



Effects of prolonged dry-spell and early Cessation of rainfall on crops

February 17, 1993



Melting of Glacier on Mountain Kilimanjaro signifies the observed warming trend over the tropics

February 21, 2000



Destruction of crops and infrastructure in Dar es Salaam from flooding



The Planning for Resilience in East Africa through Policy, Adaptation, Research and Economic Development (PREPARED) Project, the central component of USAID Kenya and East Africa's PREPARED Program, works to strengthen the resiliency and sustainability of East African institutions, by targeting three key development challenges of East Africa that are likewise high priority areas for the U.S. Government (USG): climate change adaptation, biodiversity conservation, and sustainable access to water supply, sanitation, and hygiene (WASH).

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# Mechanisms for Coping with Climate Variability and Change



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## What is climate change

Changes in the climate system can be observed through temperature increase, change in rainfall patterns, increase in frequency and magnitude of extreme weather and climate events such as floods and droughts occurrences. The observed and projected changes in the climate system may be global, regional or locally specific.

## Main Causes of Climate Change

The main cause of climate change is emission of greenhouse gases in the atmosphere particularly Carbon dioxide (CO<sub>2</sub>). Carbon dioxide creates a “greenhouse effect” by trapping the outgoing radiations from the earth’s surface and re-directing them back to the ground causing additional warming at the surface.

### Natural Factors

Natural factors that contribute to change in the climate system include volcanic eruption, earthquake and change in the earth circulation.

### Anthropogenic Factors

Human activities that contribute to change in the climate system include industrialization, burning of fossil fuel, deforestation and large scale agriculture.

## Evidences and Impacts of climate change and variability in the project area

**Food Insecurity:** Increases in climate variability-rainfall, temperature and extreme weather event; is affecting the quality and quantity of crop production. The unpredictability of the climate system combine with the occurrence of pests and crop diseases, is leading to greater

food insecurity and hunger in the project area.

**Floods:** Communities especially farmers, living along the lowlands of Kyankoma and Kirumi village have suffered more frequent and severe flooding. The floods are destroying both agricultural crops and infrastructure.

**Drought:** The Increase in frequency and magnitude of drought, coupled with the intensification of the length and the number dry spells, is severely affecting agricultural production and livestock in the project area.

**Disease:** Climate change has contributed to the increase in the occurrence of diseases and pests that affect both human and animals. This has caused a rise in the prevalence of invasive species that threaten agricultural production and excessive rainfall has lead to increase in the number of water borne disease.

The trend analysis of temperature and rainfall over the majority of Tanzania indicate an increasing temperature trend and a slightly decreasing trend in rainfall. This pattern is mirrored in Butiama district where temperature trend analysis for Musoma meteorological stations depicts increases in temperature (Fig. 1 & 2)

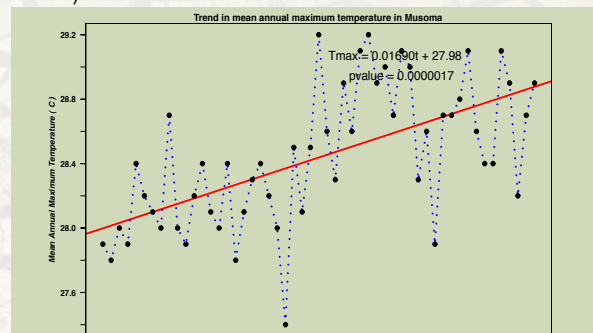


Figure 1. Trend in mean annual maximum temperature in Musoma

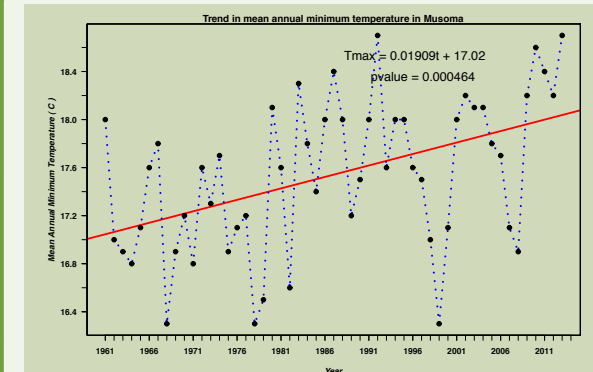


Figure 2. Trend in mean annual minimum temperature in Musoma

## Additional evidence and impacts of climate change regionally and globally.

- ✓ Melting of Glacier on Mount Kilimanjaro, Tanzania.
- ✓ Rising sea level around the Islands of Zanzibar and Pangani, Tanzania.
- ✓ Increasing frequency and magnitude of extreme weather events such as the ongoing drought in Ethiopia and frequent flooding in Narok Kenya.
- ✓ Increasing spread of diseases such as the spread of malaria to the highland areas of East Africa a previous non Malaria zone

## Climate Change Adaptation Options

Some of the potential adaptation options include:

- ✓ Promoting drought tolerant and early maturing crops such as cassava, sorghum and millet.
- ✓ Promoting water harvesting technics to store water during the rainy season for use during the dry conditions.