UN Austria Symposium 2022

Session 2 “Monitoring Earth from space”

Space Observation for Climate Change Effect

Dr. Ayman Ahmed
Egyptian Space Agency
Agenda

What is Climate Change?

Why Climate Changes?

Effect of climate Change.

Climate Change in Africa.

Space and Climate Change.

EgSA- Climate Related Projects

African Space Agency and climate Change
What is Climate Change?

Climate change refers to long-term change in:

- Temperatures
- Weather patterns

These changes are basically due to human activities.
Temperature Rise globally

Over decade

Temperature raised dramatically

ICE melting

https://climate.nasa.gov/
Climate Change Effects On Africa

https://climate.nasa.gov/
Climate Change Effects On Africa

https://climate.nasa.gov/
Climate Change Effects On Africa

https://climate.nasa.gov/
Climate Change Effects On Africa

Images of Change

Before and After

Greening of Namibia
Jan. 29, 2020 - Feb. 7, 2021

https://climate.nasa.gov/
Climate Change Effects On Africa

https://climate.nasa.gov/
Climate Change Effects On Africa

https://climate.nasa.gov/
ClimCam Project

30+ years time-series analysis of shorelines with global coverage
https://github.com/kvos/CoastSat
Clim Cam

United Nation Access to Space for All

Hands-on Component

Accessing Space with the ISS Bartolomeo Platform

Bartolomeo is an application platform on board the European Columbus module of the ISS located on its outer shell - built by Airbus


EKU- ClimCam
Egyptian Space Agency,
Kenya Space Agency,
Uganda Ministry of Science Technology & Innovation.
ClimCam

Objectives:

- Determination and allocation of climate change effects at East Africa region.
- Imaging East Africa with daily coverage area at least 20 Km² and Ground Sampling Distance 10 m at 400 Km altitude.
- Technology demonstration of the camera system onboard the ISS at exposed space environment.

United Nation Sustainable Development Goals

- SDG-2: Zero Hunger,
- SDG-4: Quality Education
- SDG-9: Industry, Innovation And Infrastructure,
- SDG-13: Climate Change Action,
- SDG-17: Partnership For The Goals;
Regional cooperation between Egypt, Kenya And Uganda

Coastal areas,
Vegetation,
Droughts,
Water Resources
Correlate the climate change variables with the effects Temperature, CO2, CH4, precipitation.

Artificial intelligence module for prediction of temperature variation and its effect on East African countries.

Forest fire detection using hyperspectral data

Costal erosion rate estimation
ClimCam

What the team will benefit from ClimCam?

Build Experience

Technical Cooperation

Monitor the East African region for food security

Enhance space based earth observation for climate change effects mitigation
ClimCam

What the team will benefit from ClimCam?

Uganda intends to increase access to information, knowledge and technologies for farmers;
reverse land fragmentation for land mechanization;
gather agricultural data/statistics;
improve weather information

Usage of water resources

Fresh water resources like Lake Victoria cover around 1/3 Uganda's total landmass

IPC v3.0 Acute Food Insecurity Phase
https://fews.net/east-africa/food-security-outlook/march-2021
ClimCam

What the team will benefit from ClimCam?

Kenya is strengthening natural resources protection, including forest and halieutic resources, through the involvement of several public bodies.

IPC v3.0 Acute Food Insecurity Phase
https://fews.net/east-africa/food-security-outlook/march-2021
ClimCam

What the team will benefit from ClimCam?

Egypt is highly vulnerable to water scarcity, droughts, rising sea levels, and other adverse impacts of climate change.

We are trying to build predictive model that helps us mitigate the effect of climate change.

IPC v3.0 Acute Food Insecurity Phase
https://fews.net/east-africa/food-security-outlook/march-2021
Clim Cam

What is next?

We hope this mission will become a **success story** in the region and encourage many African countries to work collaboratively in the future.

We also anticipate that this will expand and deepen our network of engineers, researchers, and **academia in Egypt and other countries** to build a sustainable and growing workforce.

The data that we acquire from ClimCam will be used to **build capacity both locally and regionally**.

We aim to disseminate our work and be able to share it with the **whole region and future generations**.
Thank you