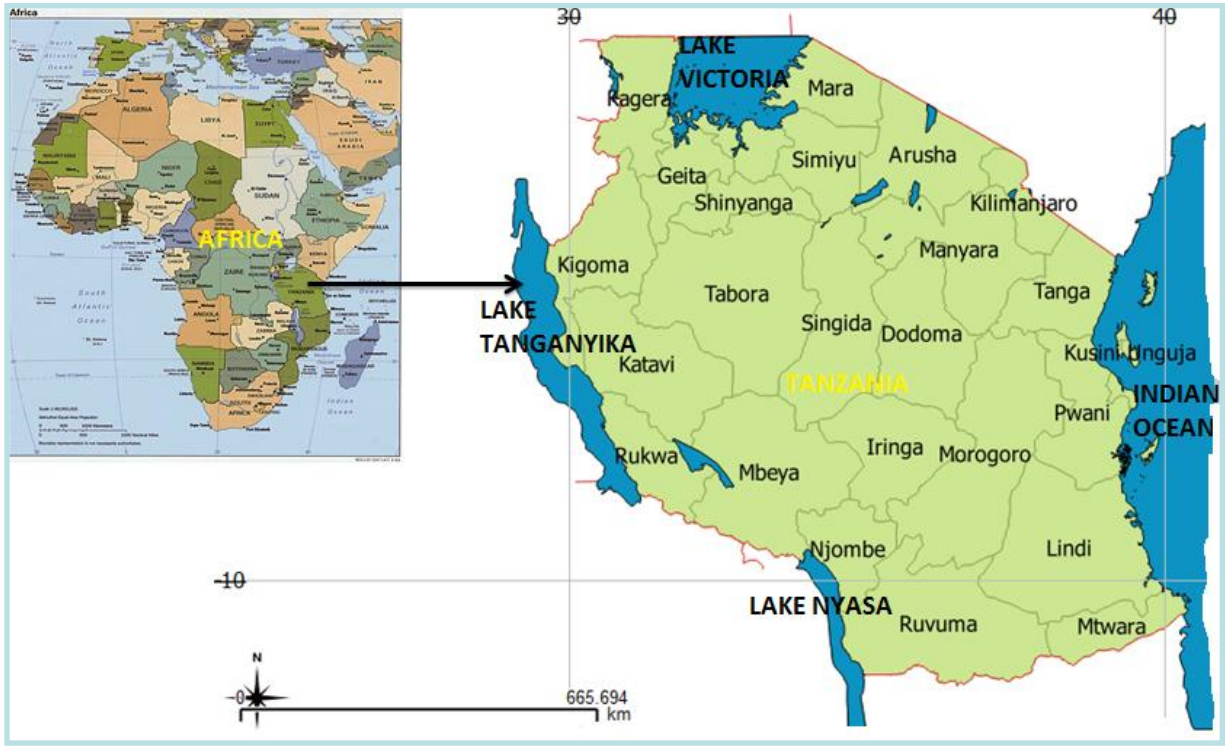
Tanzania experience on the use of Climate information/ seasonal prediction

Sarah E.Osima

Tanzania Meteorological Agency

(Principal Meteorologist and climate scientist)

Location of the United Republic of Tanzania



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❖Climatology of Tanzania

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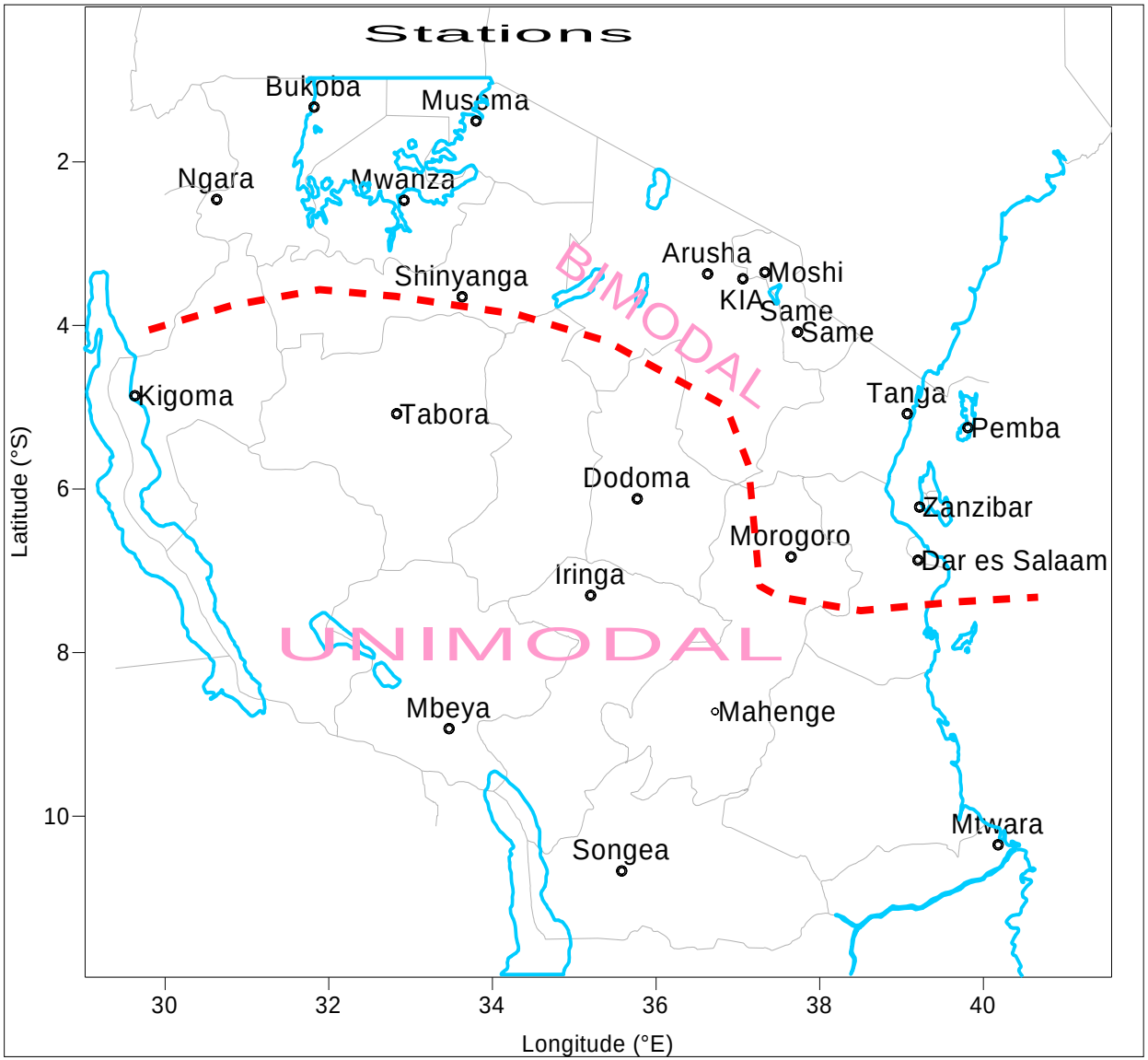
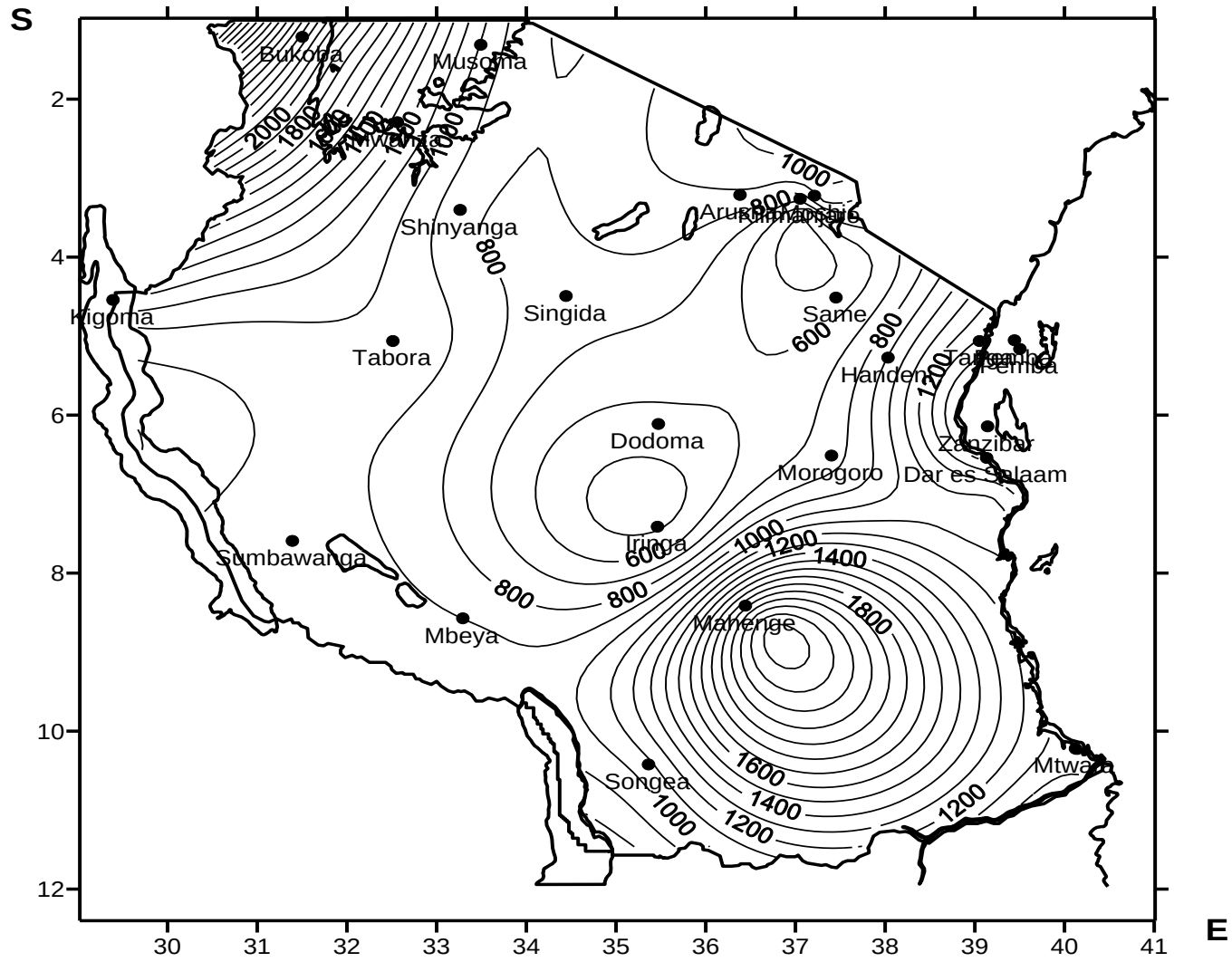
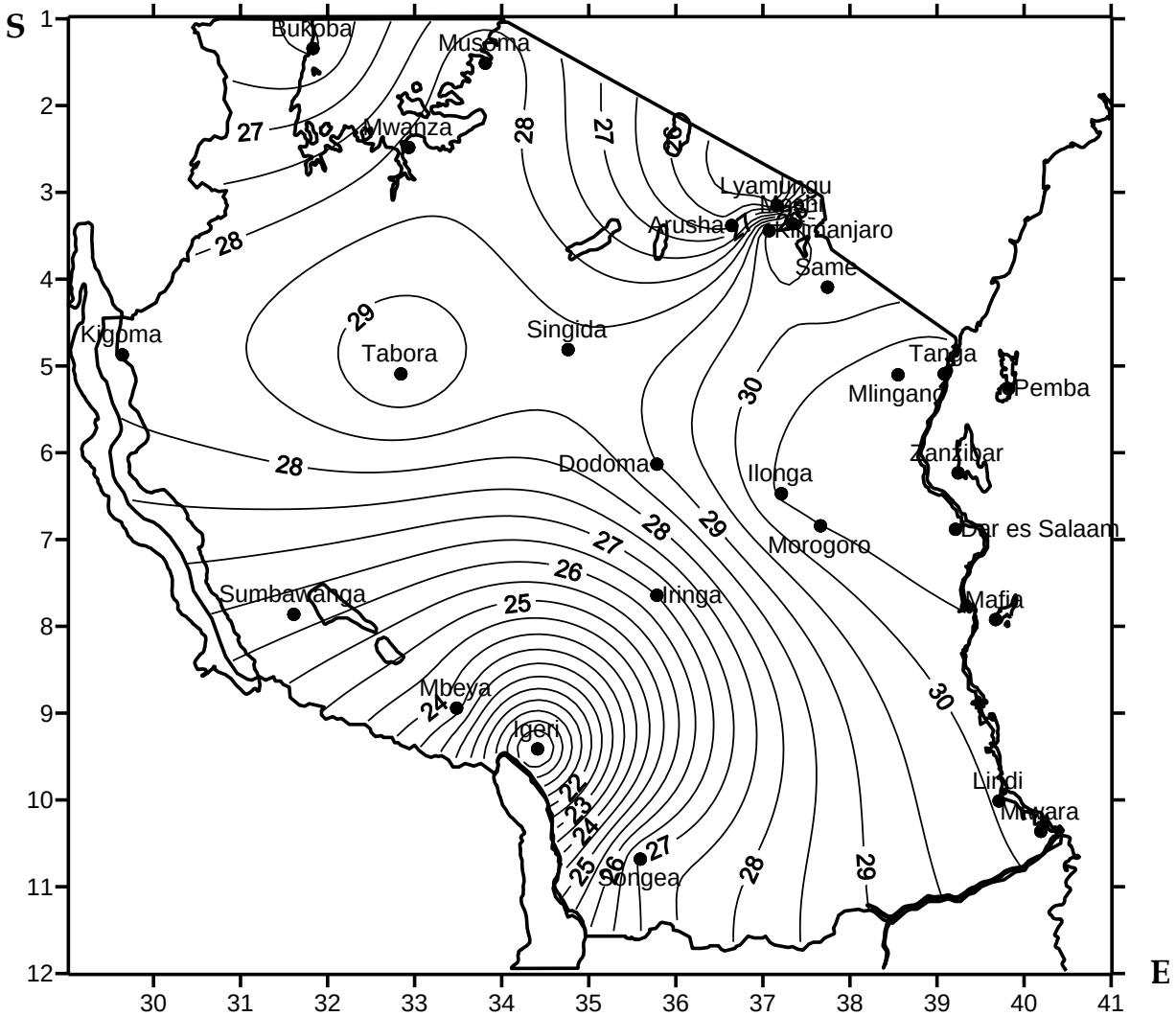


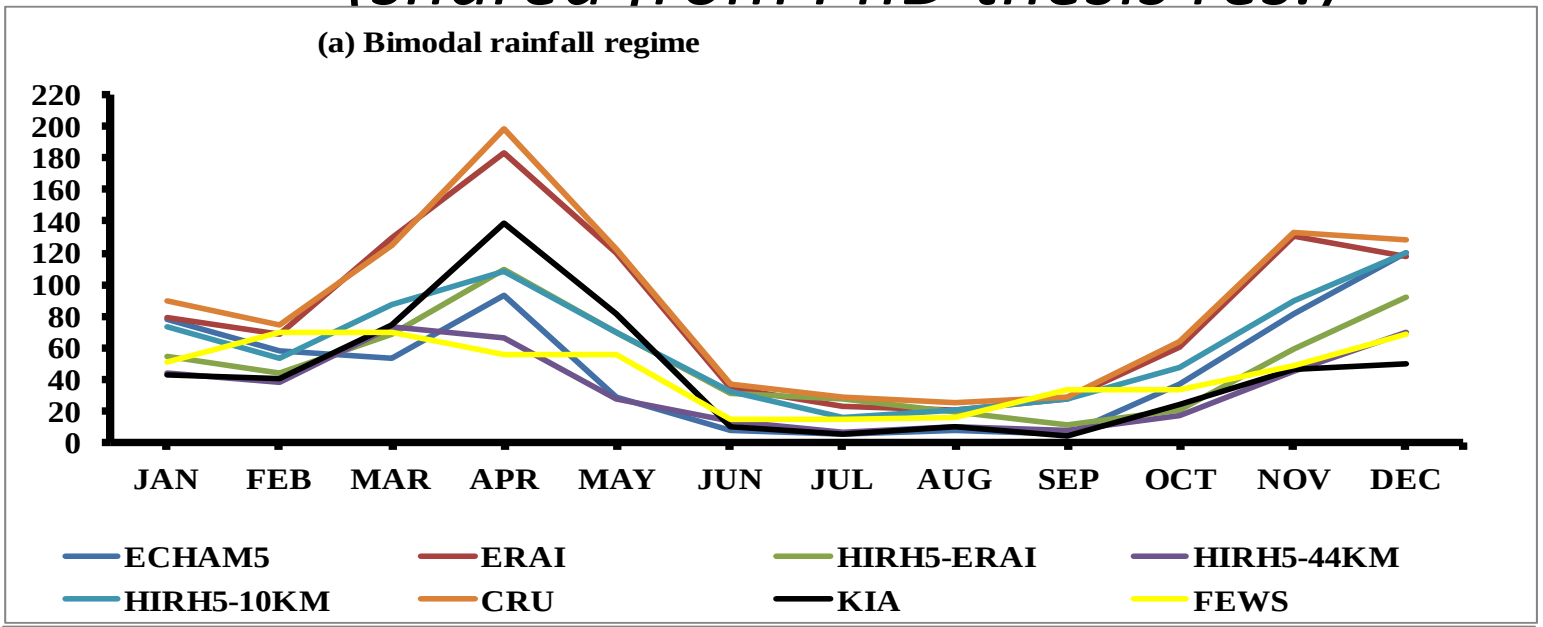
Rainfall distribution in Tanzania

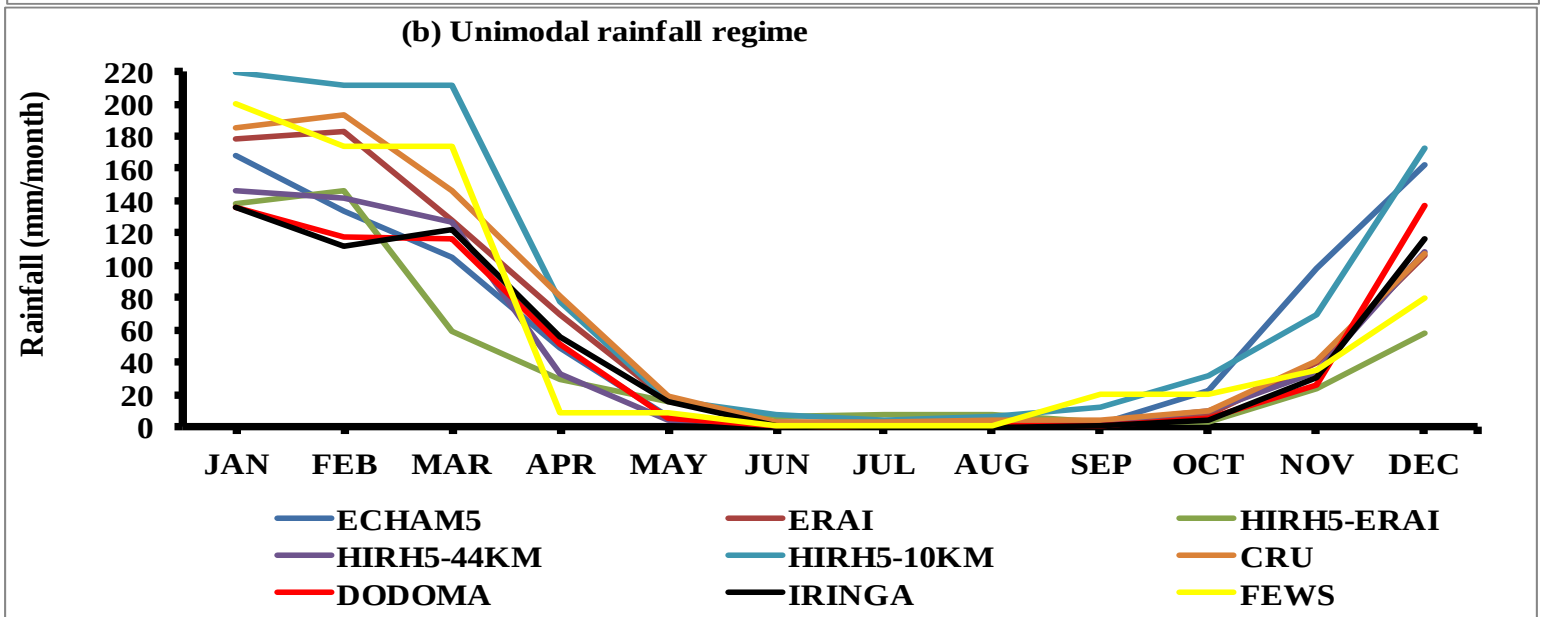


Temperature distribution Tanzania

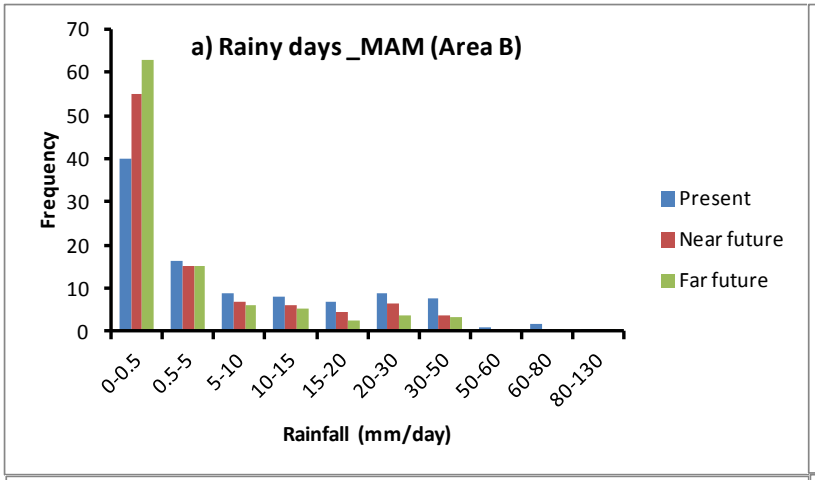


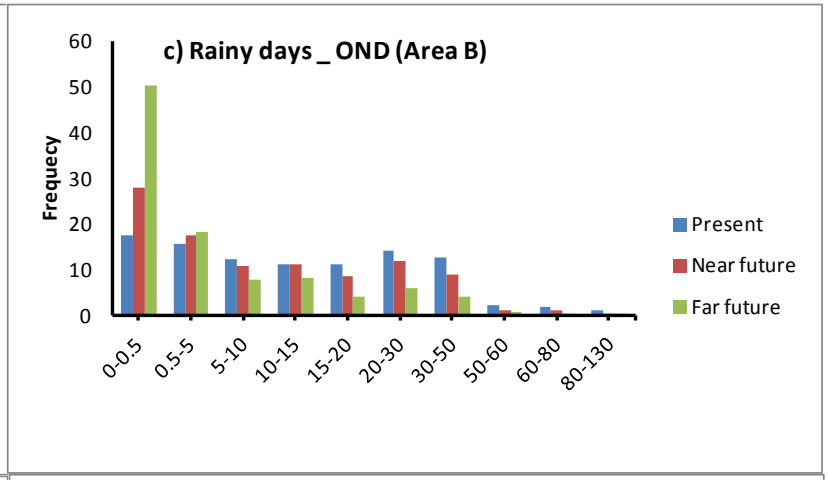
Rainfall climatology (1980-1999)_CORDEX (shared from PhD thesis res.)

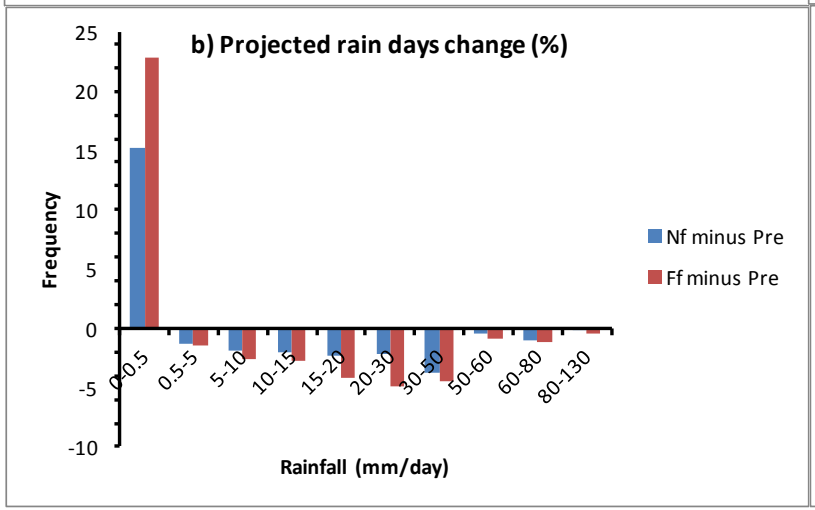


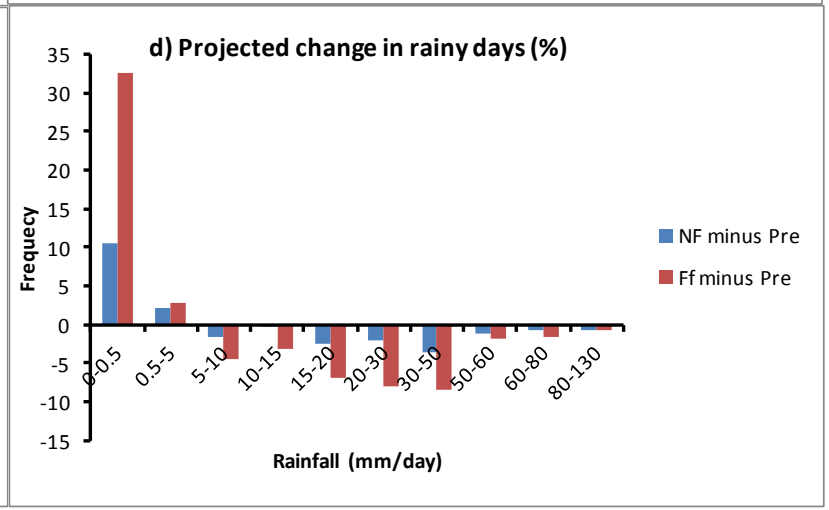


Rainfall projection (shared from PhD thesis res.)









❖Some evidences of extreme climatic events

- **It is known that Tanzania and most regions around Indian Ocean had experienced ENSO impacts. In 1997/1998 very heavy rainfall (floods) followed with prolonged drought 1999/2000 which lasted to 2004. In the year 2005 and 2010 East Africa experiences two catastrophes: floods and drought respectively.(Many studies including the IPCC's reports).**
- **Glacier retreat atop Mount Kilimanjaro .**


Feb 1, 2001
Kibo
Shira Plateau
1960
Nov 28, 2009

Landslide over Usambara mountains during EL-Nino year 1997/98.

Extreme heavy rainfall Dec/2011

Extreme heavy rainfall during MAM rainfall season 2014 (Dar es Salaam)

2. Weather forecast

- Daily weather forecast
- 10 day weather forecast
- Monthly weather forecast
- Seasonal weather forecast

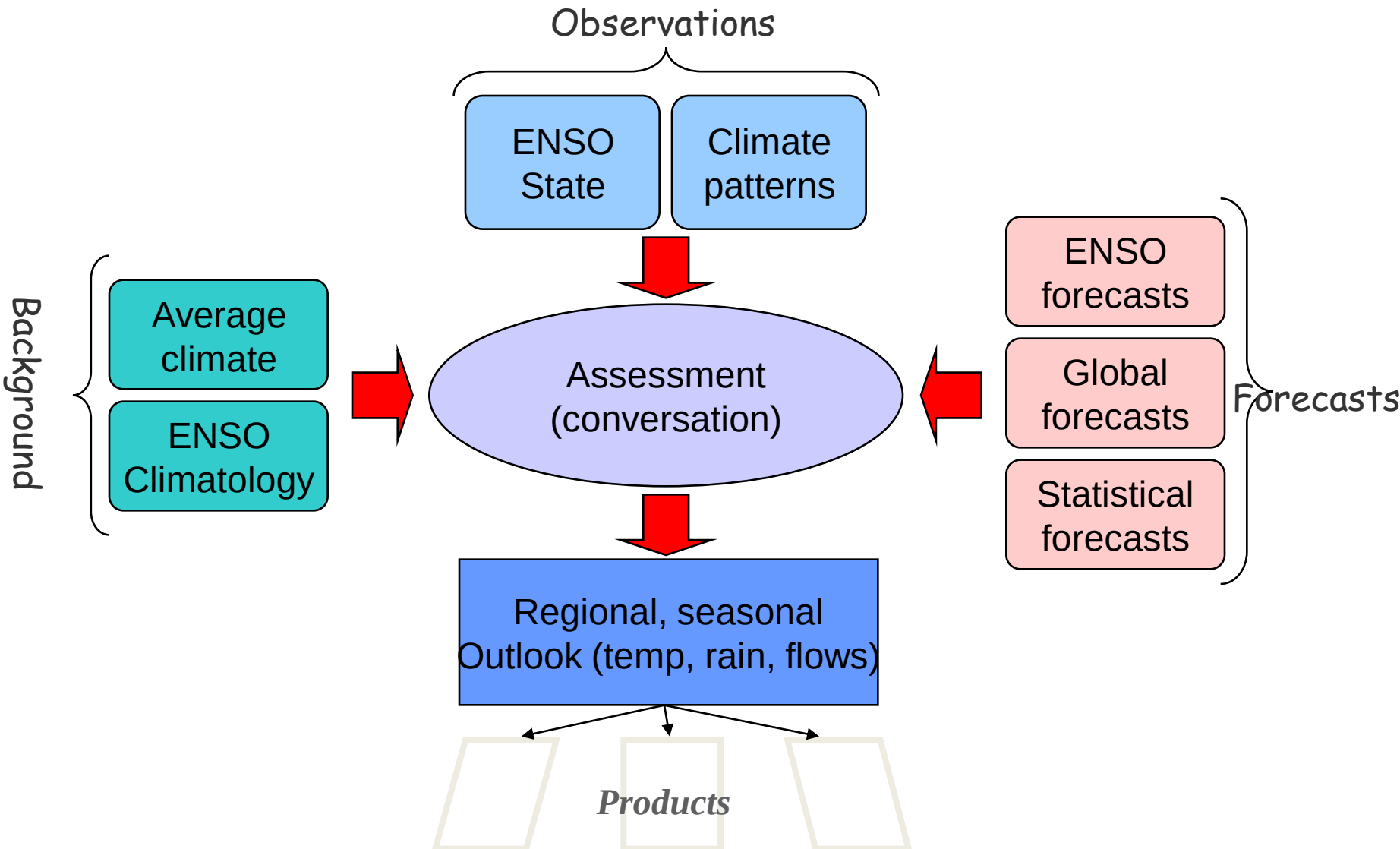
❖Early warning

- Tanzania Meteorological Agency (TMA) is a center for early warning system
- TMA collect, process, store and disseminate meteorological information
- TMA provides and disseminates wx forecasts and unepected extremes wx events (floods/drought) and other wx related hazards information for safety of life and property
- TMA collaborates with other institutions and various stakeholders including the Ministry of Agriculture and Food Security and Prime Minister's Office (Disaster management sect), research institutions and NGO's.

❖Early warning cont..

- TMA has recently launched a bulletin called ‘ Climate status of Tanzania (released annually)
- TMA takes part world wide in global exchange of meteorological data and products for the safety of humankind and to enhance the understanding of the global atmosphere

3. Prediction Process



❖Data used in seasonal prediction

•The data used in wx weather forecasting is the existing climate data on sea surface temperatures, which are then used in ocean-atmosphere dynamic models, coupled with the synthesis of physically plausible national and international models

•The ocean variability is an important feature in manipulating climate variations and changes due to the ocean's capacity to absorb from and release heat back into the atmosphere

GLOBAL OCEANS COMMUNICATE

❖Experiences and Challenge cont..

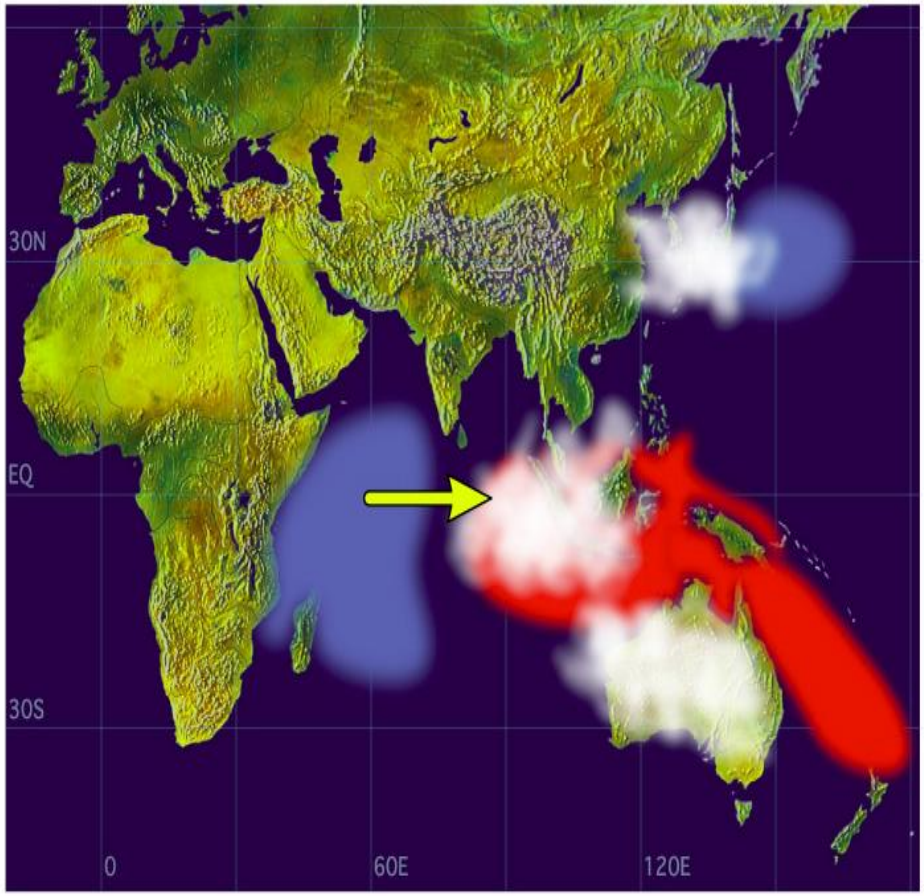
- Different models interpretations (daily weather forecast).
  -Needs for evaluation/verification of these models
- How to communicate the uncertainty of the wx forecast to the stakeholders/user information (farmers)
- Language used for farmers (other key stake holders)

Indian Ocean Dipole (IOD)

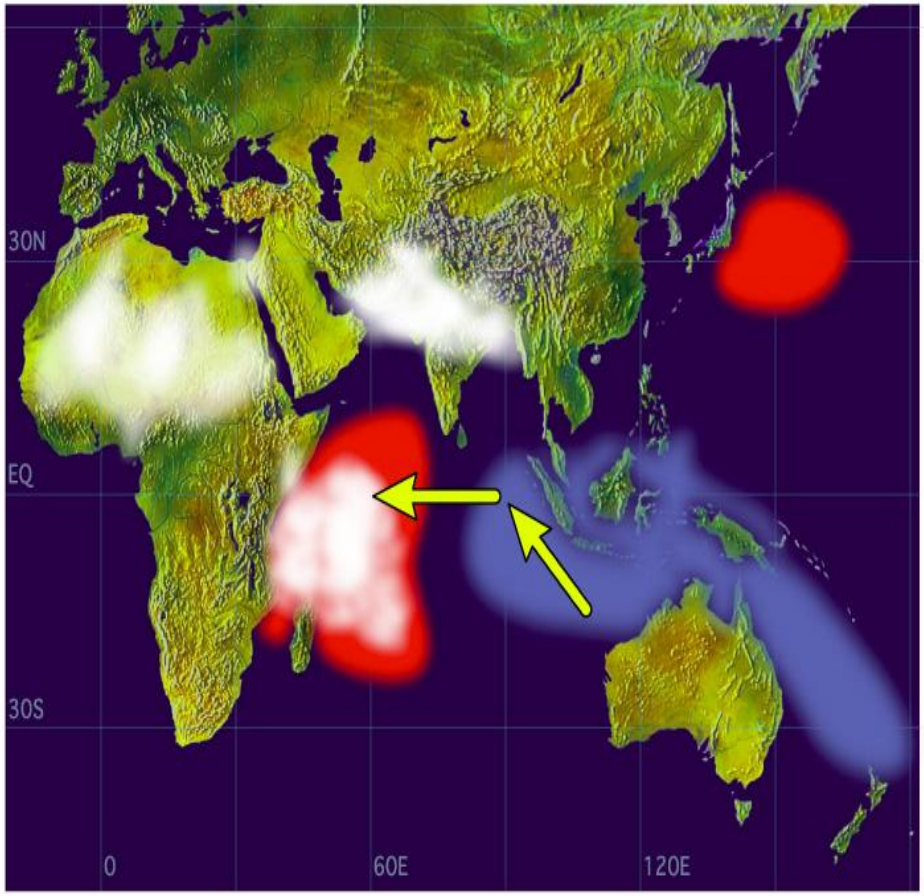
180 120W 60W

JAMSTEC 独立行政法人 海洋研究開発機構
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

Negative Dipole Mode



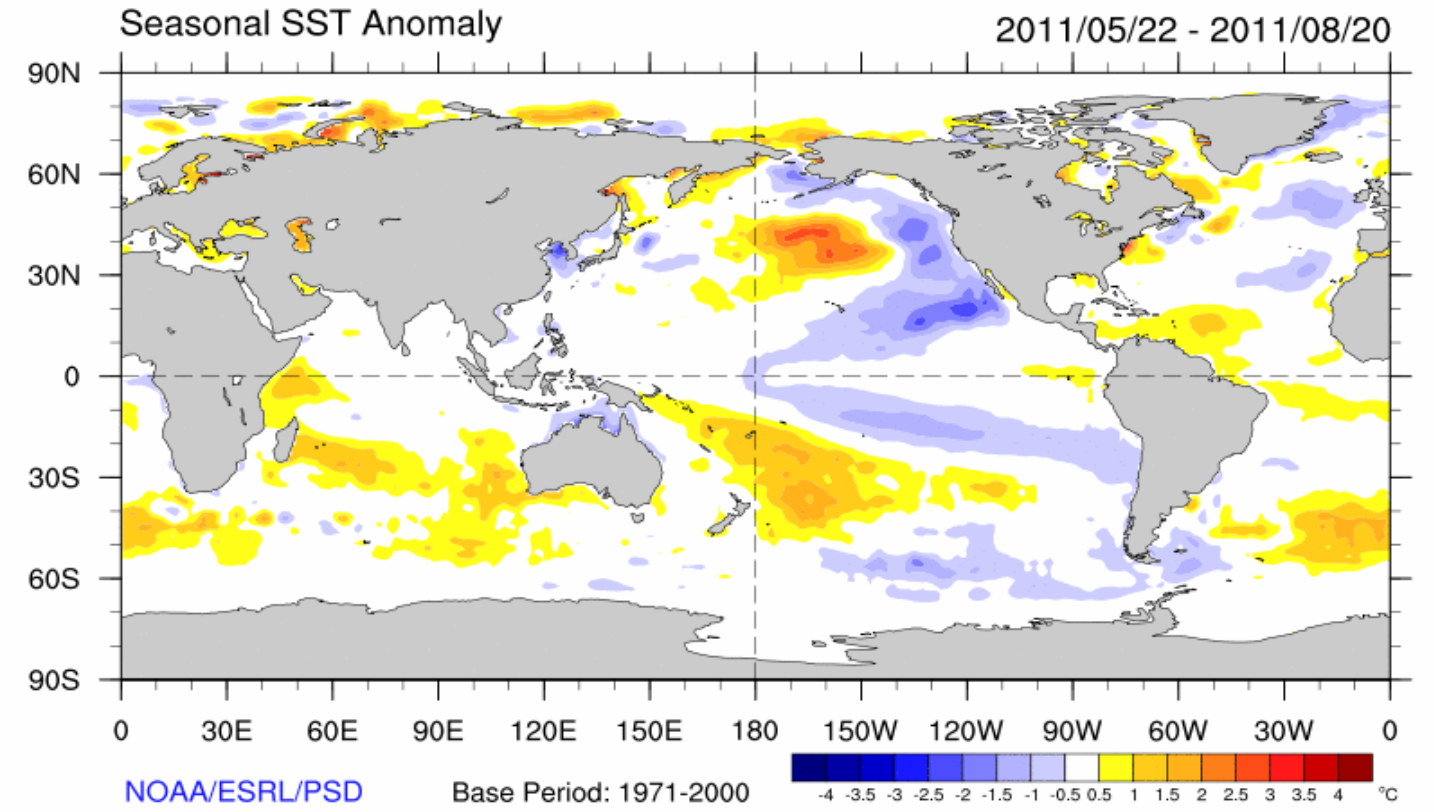
Positive Dipole Mode



Source: Japan Agency for Marine-Earth science and Technology

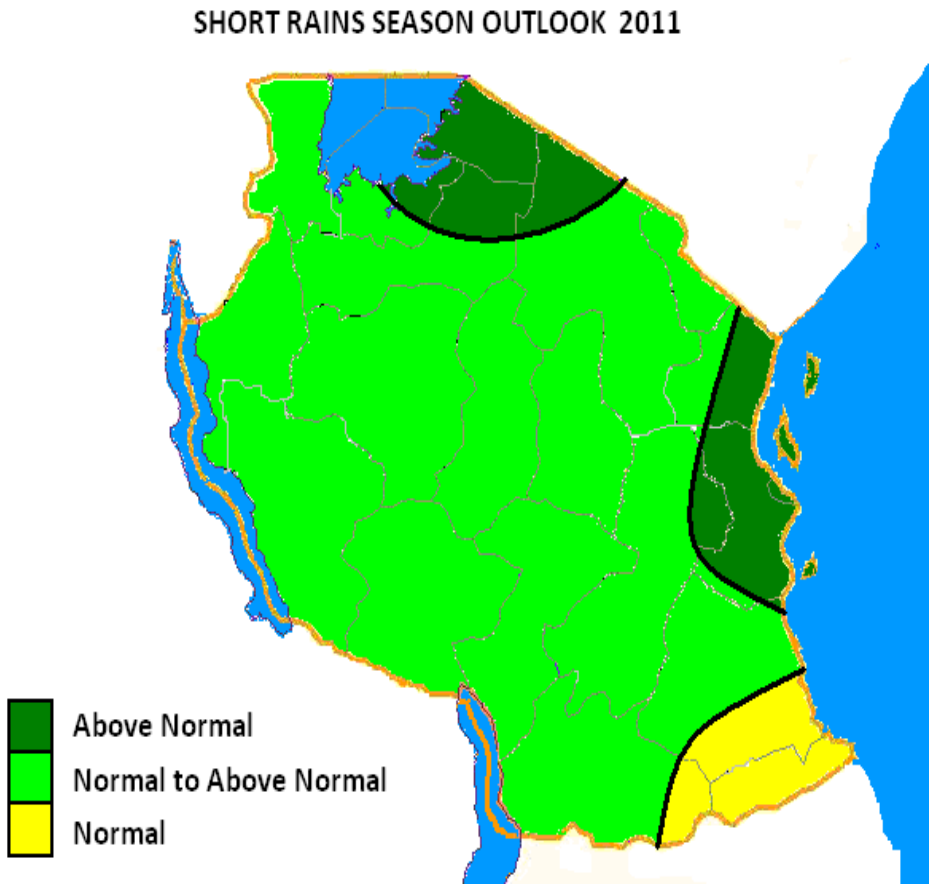
Seasonal SST Anomalies (ºC):

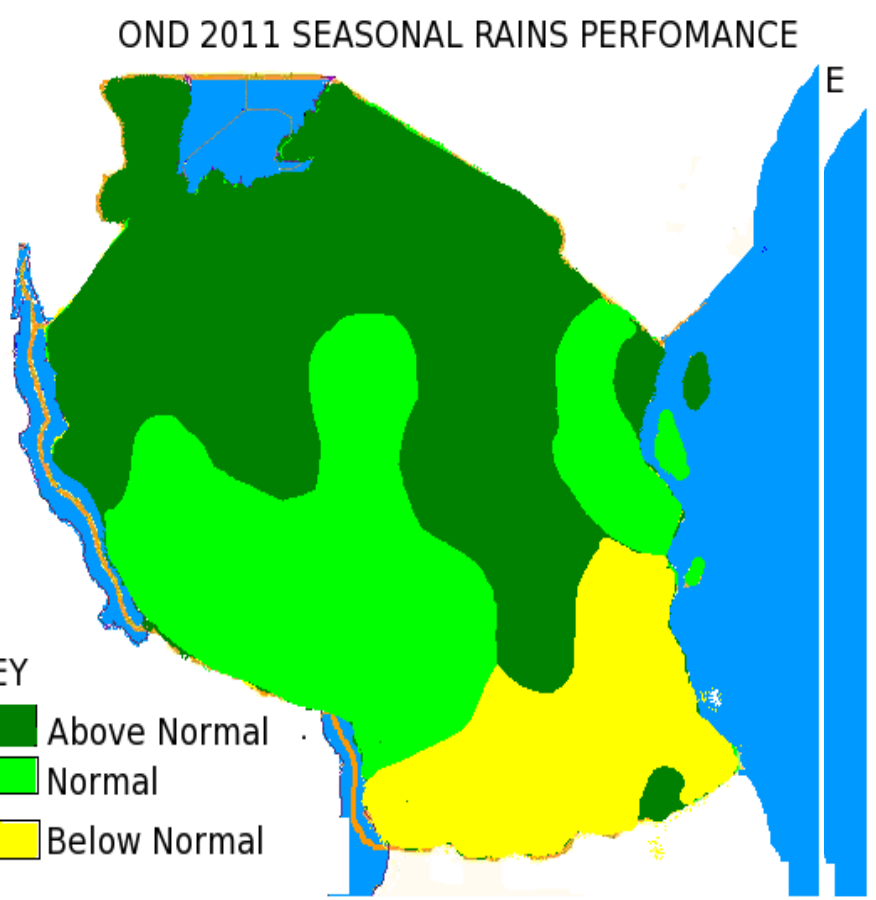
22 May -20 August 2011



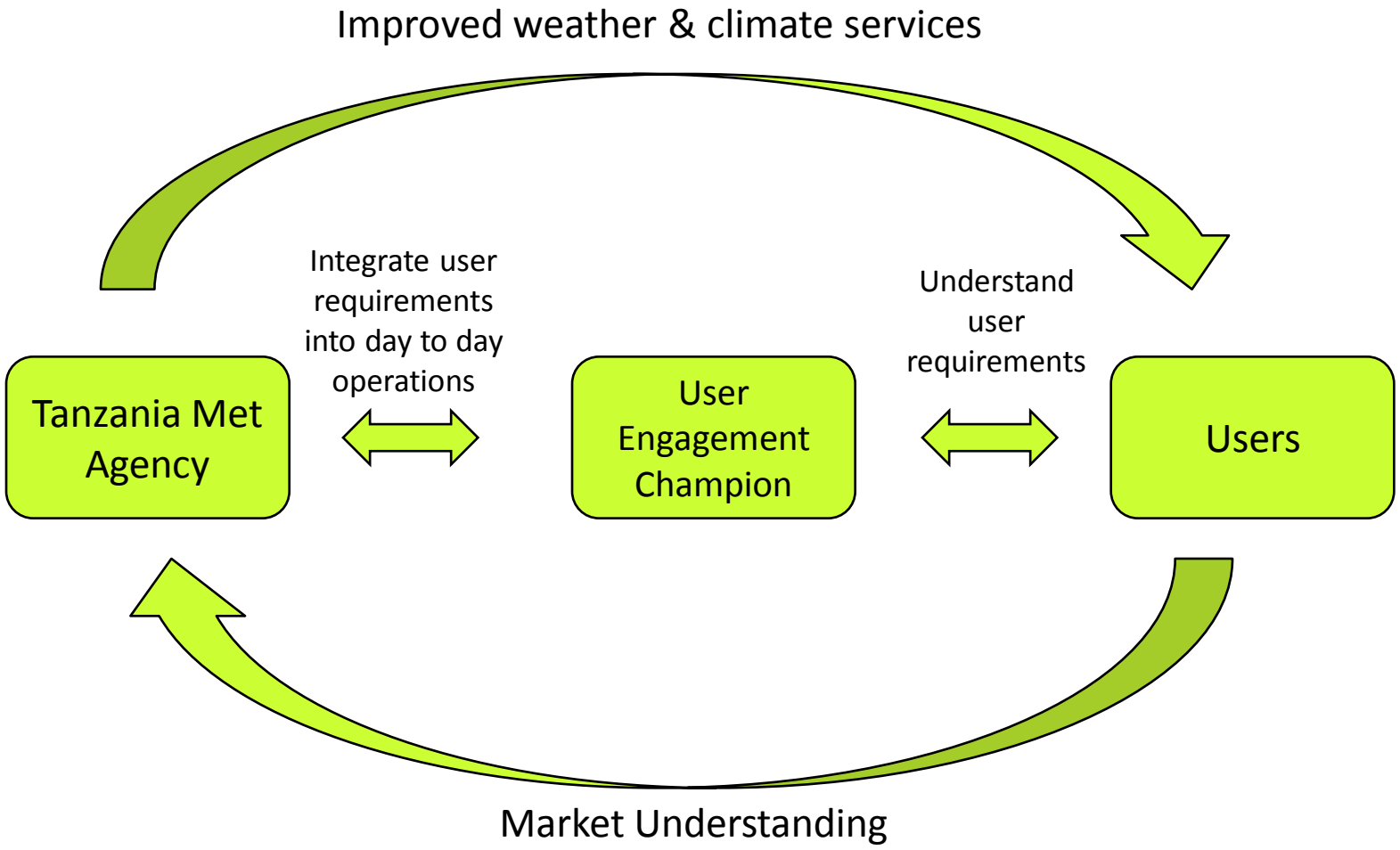
During the 22 May – 20 Aug 2011 period, equatorial SSTs were above-average in the eastern Pacific and western Indian Oceans, while neutral conditions over western Pacific and cooling over northern Atlantic oceans.

OND 2011 RAINS: OUTCOME





4. User Engagement Strategy



❖Stakeholders‘ participation

Public Weather Services dissemination channels

Social Networks

Mobile phones

How we reach the society (User Interface)

- TMA uses Television, Radio, Blogs, Newspapers, journals, mobile phones and social networks such as facebook, tweeter and youtube to reach the society.
  - ✓ (www.facebook.com/tmaservices)
  - ✓ (www.twitter.com/tma services)
  - ✓ (www.youtube/tanzaniametagency)
- Advisories websites -www.meteo.go.tz
  - ✓ www.wamis.org
- Feedback from clients shows that 75% are satisfied with TMA services.

FarmSMS

FarmSMS implementation in Tanzania. This enables farmers to get a short message on wx forecast through mob.phone

Communicating weather information to farmers (mob.phones)

User Engagement Strategy cont.






❖Needs for Agriculture Sector

- Types of information
  - Farmers would like **onset of rainfall** (when to plant), total **amount of rainfall**, end of rainfall, duration of rainfall (when to harvest)
  - Plain / meaningful language related to farmer's actions
  - Information needs to be **localised** / downscaled (districts and regions)
  - Integration of TMA climate information with indigenous knowledge
  - Preferred **lead time: 1 month** – need time to cascade to communities
  - Long term climate information for seed manufacturers
  - Historical climate information to understand crop / climate pattern
- Communication Channels
  - Community Radio (special programs based on forecasts)
  - Agriculture extension workers (to explain impact to farmers)

❖Future Directions of TMA

- Improve and expand network stations and research in climate change science
- Improve better **two way information flows**
  - link scientists and decision makers and understand information needs (eg. indentify gaps and data needs)

Thank you for your attention
“Asante kunisikiliza”
“MERCI BEAUCOUP”
“AMESEGNALEHU”