Integration of GEOGloWS-ECMWF Streamflow Forecasting into the Community-Based Flood Early Warning System (CBFEWS) in Malawi.

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RCMRD

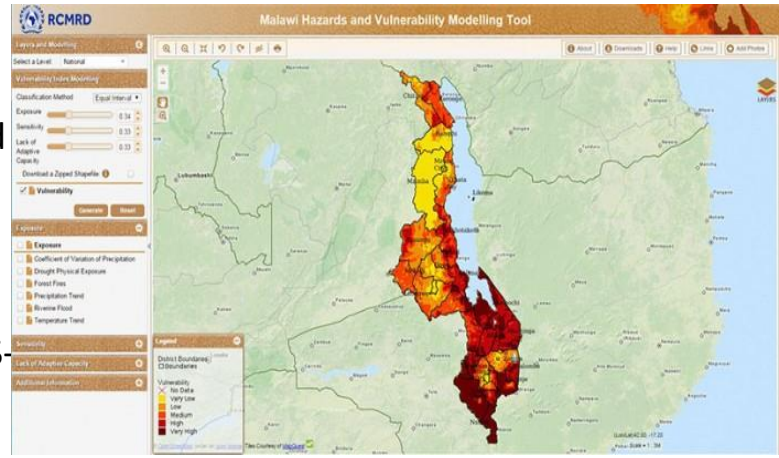
RCMRD GROUP ON EARTH OBSERVATIONS Sustainable Eco Engineering AfriGEO SERVIR ICIMOD GREEN CLIMATE FUND UNDP

PROBLEM STATEMENT & BACKGROUND

- Hydrometeorological disasters (Flood & Drought) makes up more than 75% of all natural disasters occurring in Malawi.
- It impacting lives & livelihood of millions of people and destroying physical infrastructure hence reversing recent economic gains.
- The number of people and their livelihoods affected by floods in Malawi increases each year with increased frequency and magnitude of flood occurrence.
- Impact of climate change, variability and changing demographics in the country's vulnerable floodplains are the two central factors making Malawi vulnerable to floods related disasters.

Flooded downstream villages Karonga Districts

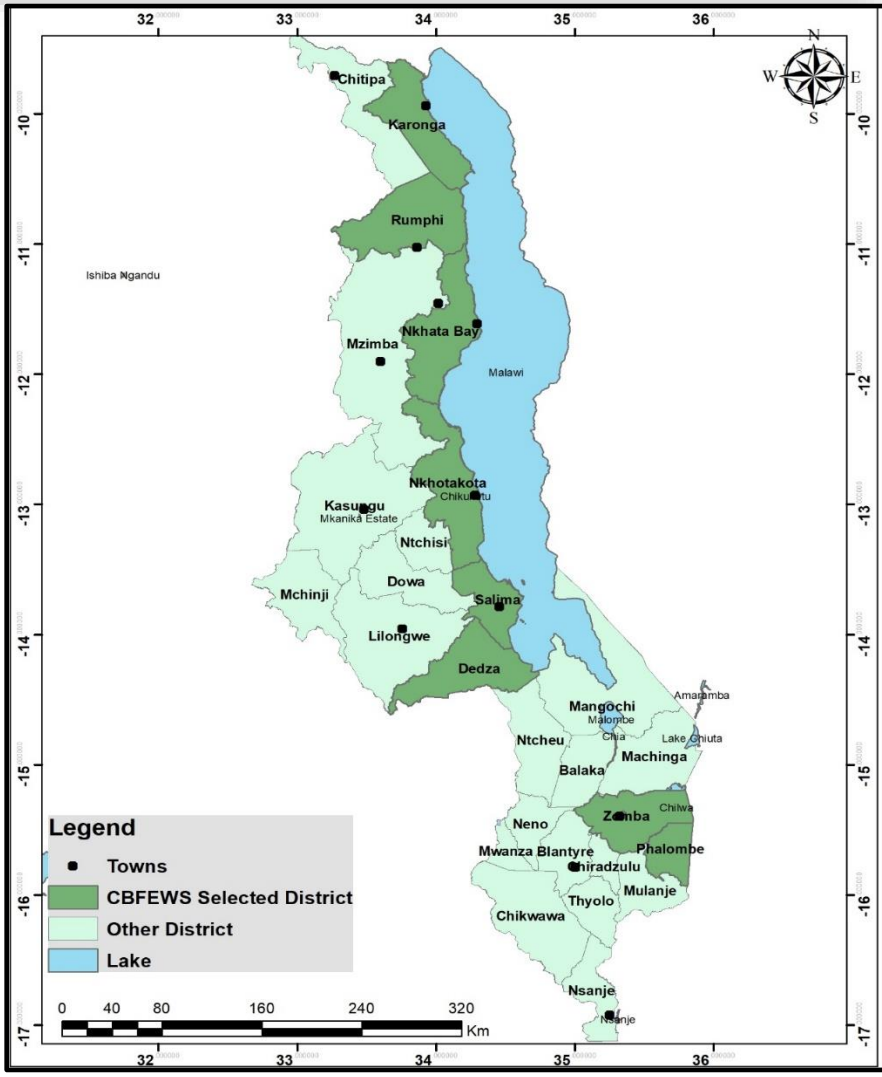
With financial support from the GFC through UNDP, RCMRD partnered with the ICIMOD and SEE of Nepal and collaboration DoDMA, DCCMS, DWR & MRCS to establish an operational hybrid flood forecasting system using telemetry data from 21 river stations and the GEOGloWS-ECMWF streamflow forecast for the eight flood-prone districts of Malawi.



Determining Malawi's Vulnerability to Natural Disasters

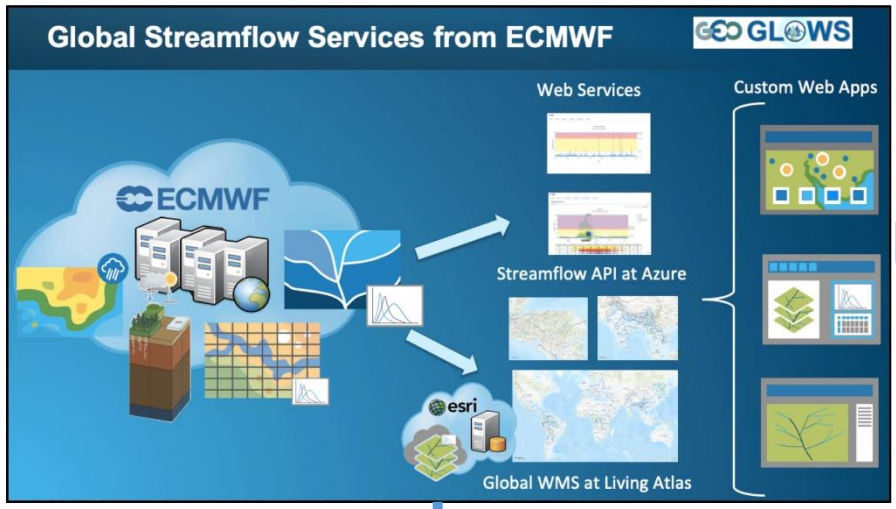
OBJECTIVES

- To establish telemetric community-based flood early warning systems (CBFEWS) in 8 selected flood prone districts of;
    1. Karonga
    2. Salima
    3. Dedza
    4. Nkhotakota
    5. Nkhata Bay
    6. Rumphi
    7. Phalombe
    8. Zomba
- Leverage the EOs and Satellite data to compliment telemetric CBFEWS.
- Capacity build the mandated government institutions on the integrated system.
- Evaluate the system performance during the times of flooding and develop SOP.



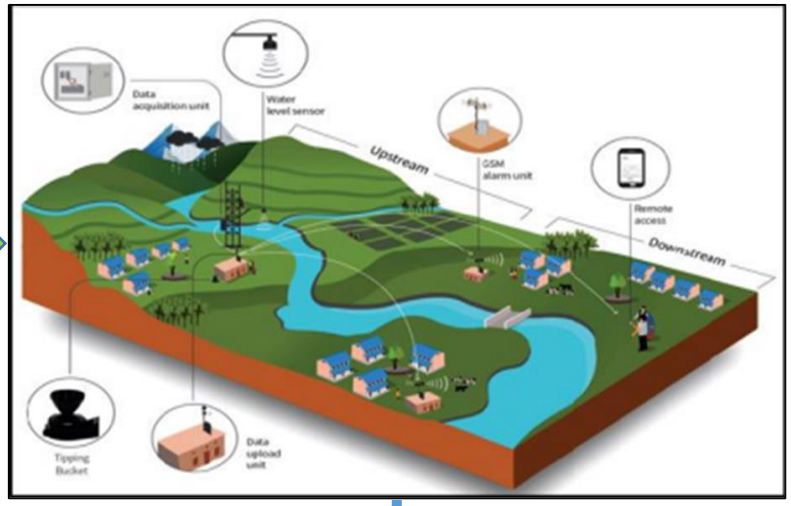
APPROACH AND METHODOLOGY

GEOGloWS ECMWF – Streamflow forecasting



API

Telemetric CBFEWS



Integrated CBFEWS

Flood Warning – Swift Response (<4 hrs lead time), Alarm triger

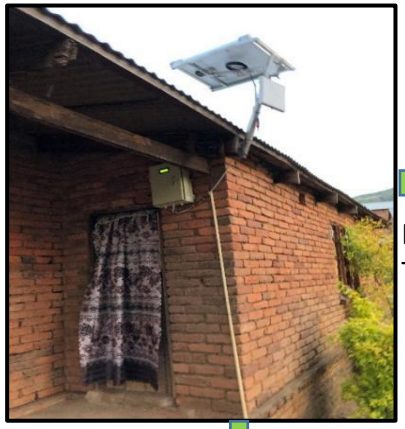
Early Warning – No cost action (<10 days lead time), No alarm triger

APPROACH AND METHODOLOGY – CBFEWS Components

Water level Sensor (DA)

Data Transmission

Data Server Upload (UA)



Manual Triger

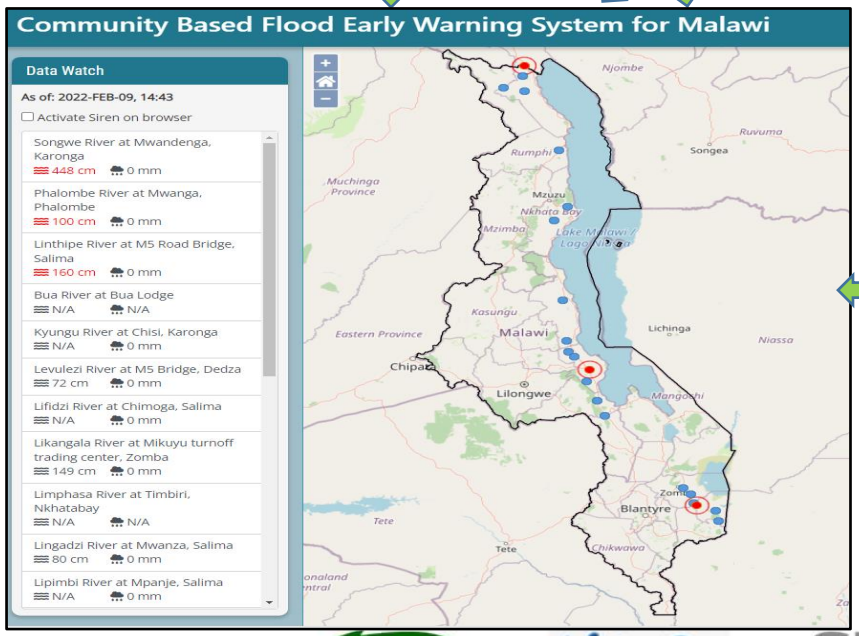
Remote Trigger

Alarm Unit (AU)

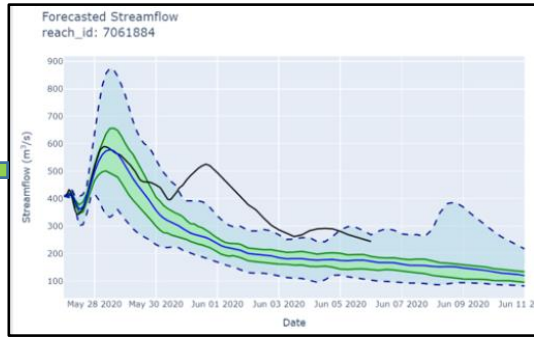
Upload

Alarm track

OC trigger



GEOGloWS Streamflow forecast



Manual River Staff Gauge

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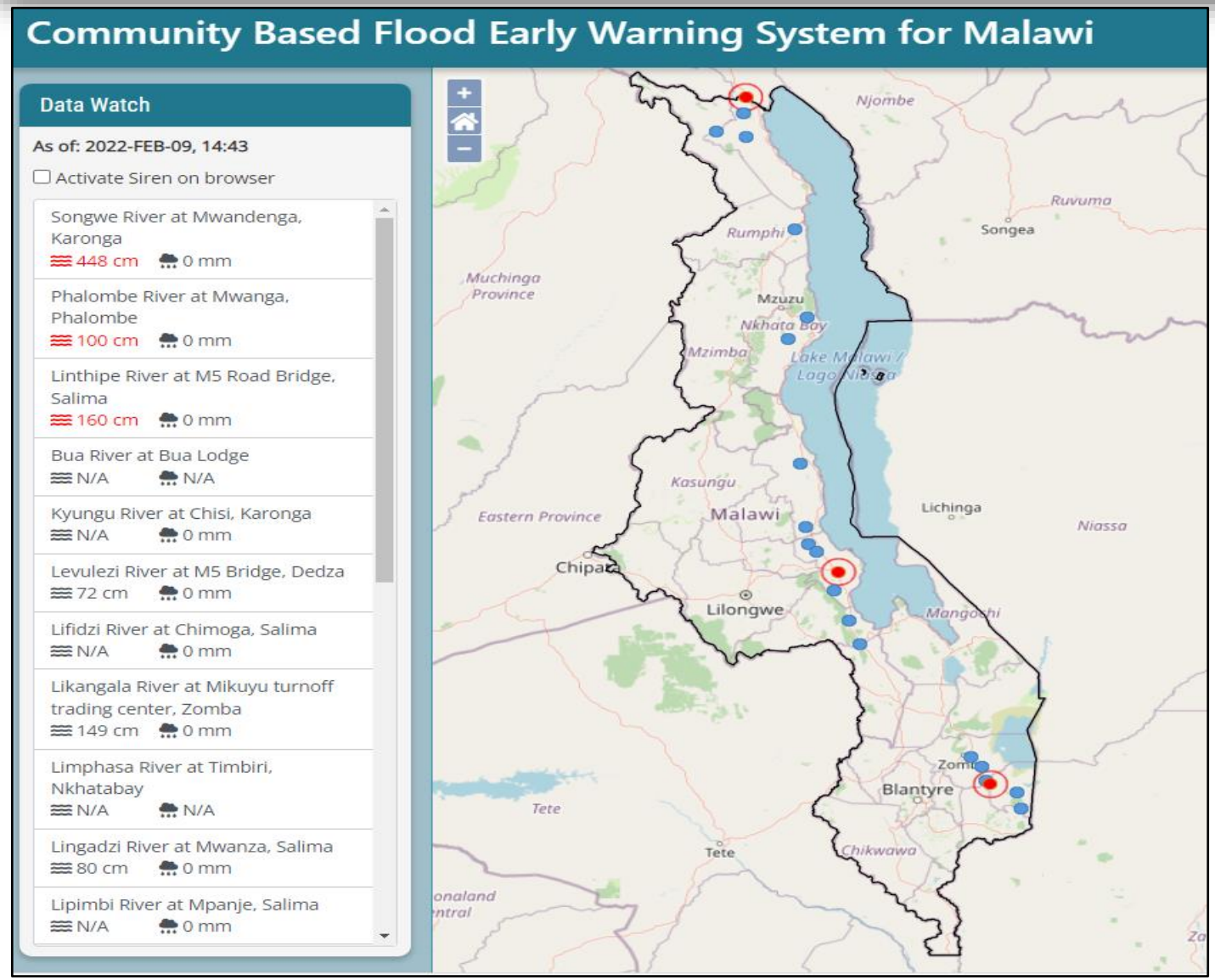
INTEGRATED CBFEWS DATA PLATFORM

http://malawi.cbfews.com/



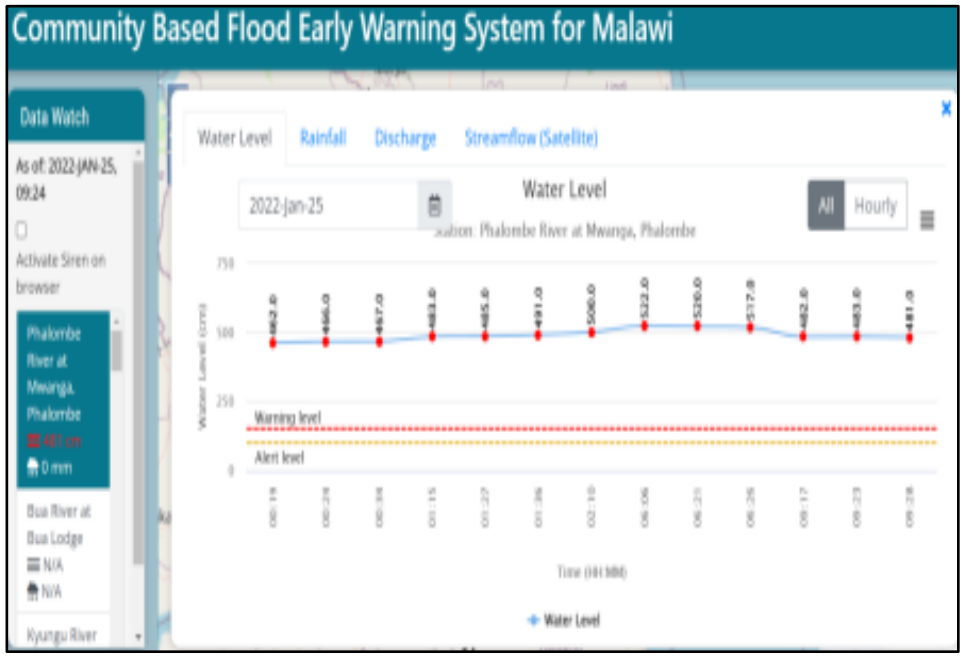
- Installed 21 telemetric stations in the 8 districts.
- Data visualization planform assessable by the Authorities;
  - ❖ DoDMA,
  - ❖ DCCMS
  - ❖ DWR
  - ❖ MRCS

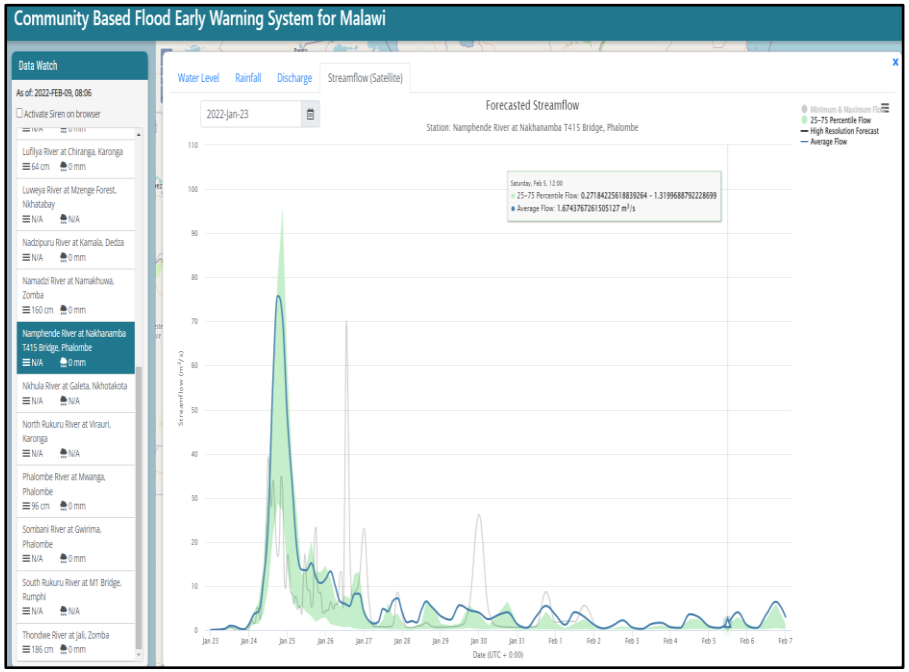
Warning Information

- ❖ Alarm/Siren,
- ❖ Bulk SMS
- ❖ Phone call
- ❖ MRCS

PROJECT OUTPUT

http://malawi.cbfews.com/





OUTCOME

- Enhance lead time for flood risk response and preparedness
- Improve capacity in flood forecasting and early warning information
- Reduced risk for flood disaster

PROJECT OUTCOME

- The system currently support the government's efforts to expand the use of Modernized Climate Information and Early Warning systems (M-CLIMES),
- GEOGloWS implementation has increased the warning lead time from hours to 15 days and complements the telemetric sensors during the downtime period. This capability enhances community preparedness and leads to early action that significantly reduces the flood disaster risks, as demonstrated during Cyclone Ana.
- Next step to include;
  - Implementation of SOP & Operationalization
  - Training and Capacity building on GEOGloWS bias correction
  - Streamline the warning information to community level understanding
  - Partnership and collaboration for scalability and transferability

Insert Links

https://www.rcmrd.org/
https://geoglows.ecmwf.int/
http://malawi.cbfews.com/
https://earthobservations.org/geo_blog_obs.php?id=546
https://www.nyasatimes.com/dodma-installs-flood-warning-technology-in-rumphi/


Thank You