



World Food  
Programme

# South Sudan: climate change, community resilience & adaptation

November 30<sup>th</sup>, 2021

SAVING  
LIVES  
CHANGING  
LIVES



SOUTH SUDAN

**Food Security &  
Livelihoods Cluster**

*Strengthening Humanitarian Response*

*Fangak County, Jonglei State, 22<sup>nd</sup> October 2021*

PHOTO: WFP/Marwa Awad

# The reality of climate change in South Sudan

Over the past 30 years, **South Sudan has been among the most rapidly warming locations on the globe**, with temperatures increasing as much as 0.53°C per decade - **two and a half times greater than the global average.**

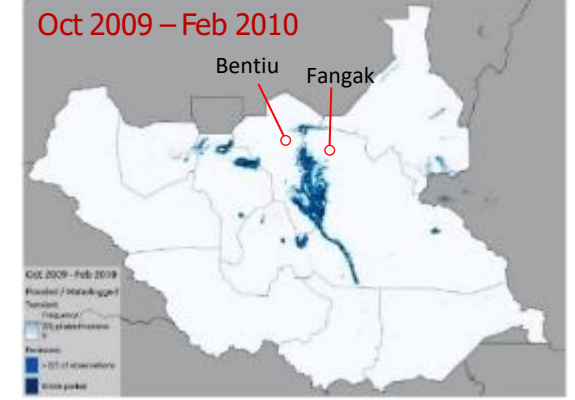
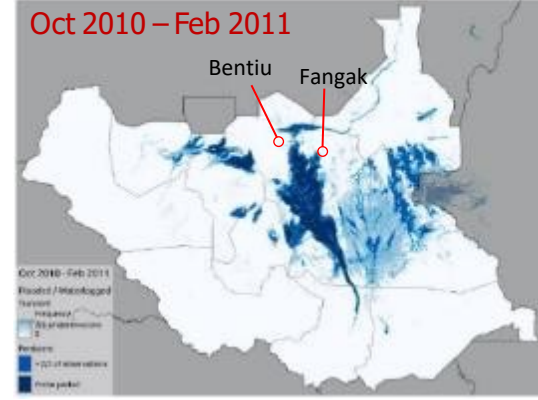
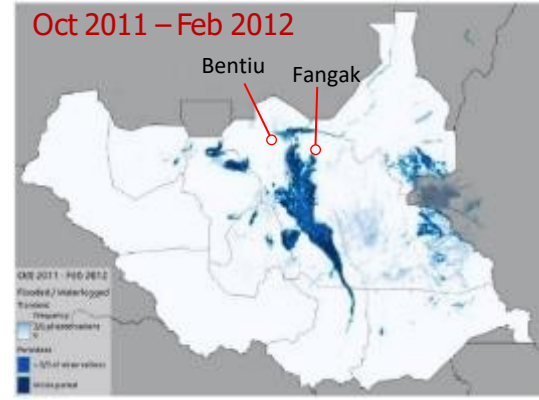
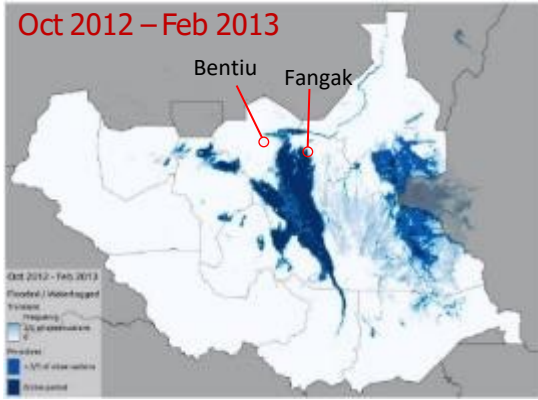
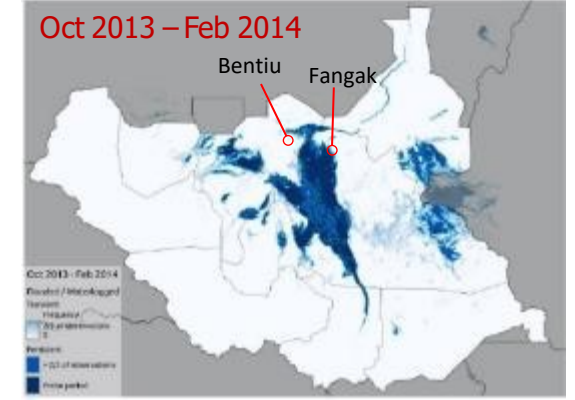
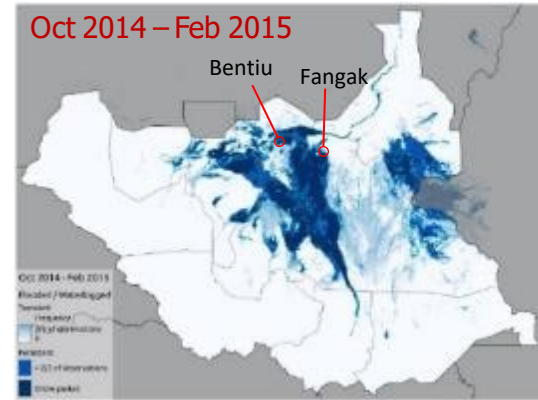
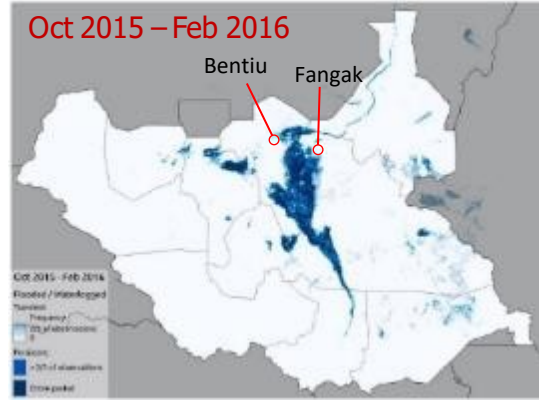
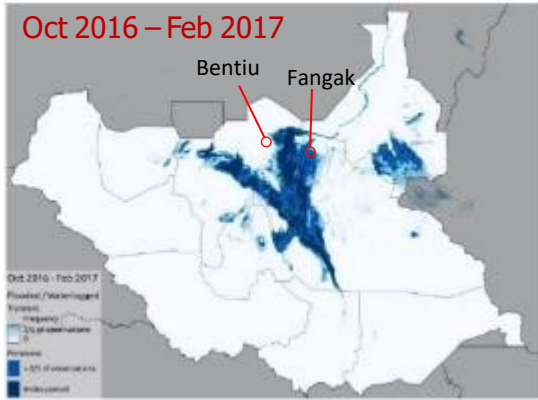
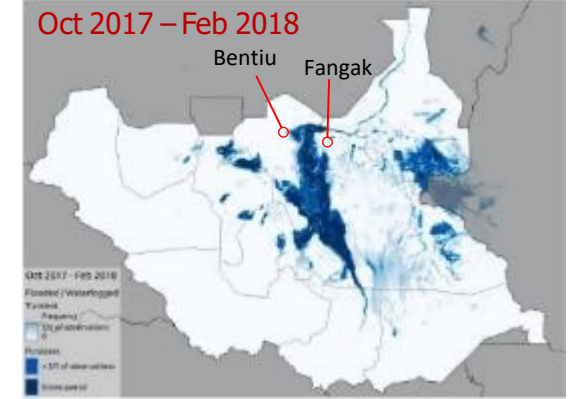
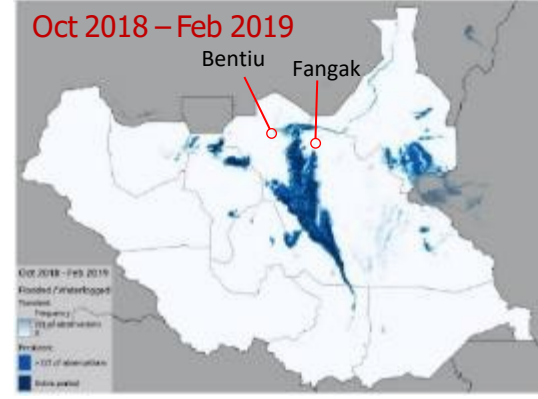
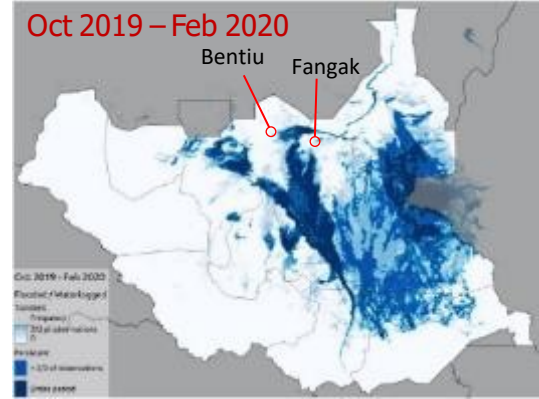
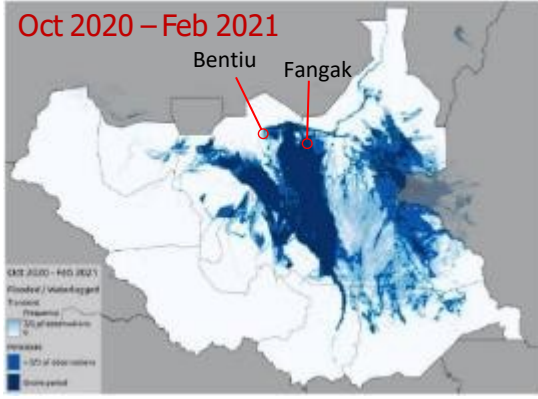
Nearly **87% of the South Sudanese population depends on agriculture, livestock, and forestry** and hence climate change is having a particularly **profound impact with changing weather patterns** and increased intensity of natural disasters.

**South Sudan has been hit by prolonged drought events, weather- and vegetation-induced locust infestations as well as record floods**, which, in terms of extent and duration, in 2019, 2020 & 2021 exceeded the usual seasonal flooding by a large margin and affected vast parts of the country.

**Horn of Africa region is expecting prolonged dry spells** possibly even drought but South Sudan is experiencing excessive flooding but **not driven by rainfall!!**



# South Sudan Wetland Extent Analysis: Seasonal Maps (October – February ) 2010 - 2021



- **Farms inundated & crops destroyed;**
- **Access to markets & collection of wild foods restricted;**
- **Loss of livestock products:** cattle starve/ high disease prevalence/ animals migrate longer distances/ milk unavailable
- **Flooding in the dry season;**
- Locations water logged for 12 months;



*Cows are seen grazing in the floodwaters of Paguir village, Old Fangak*



*Submerged and destroyed shelters, New Fangak*

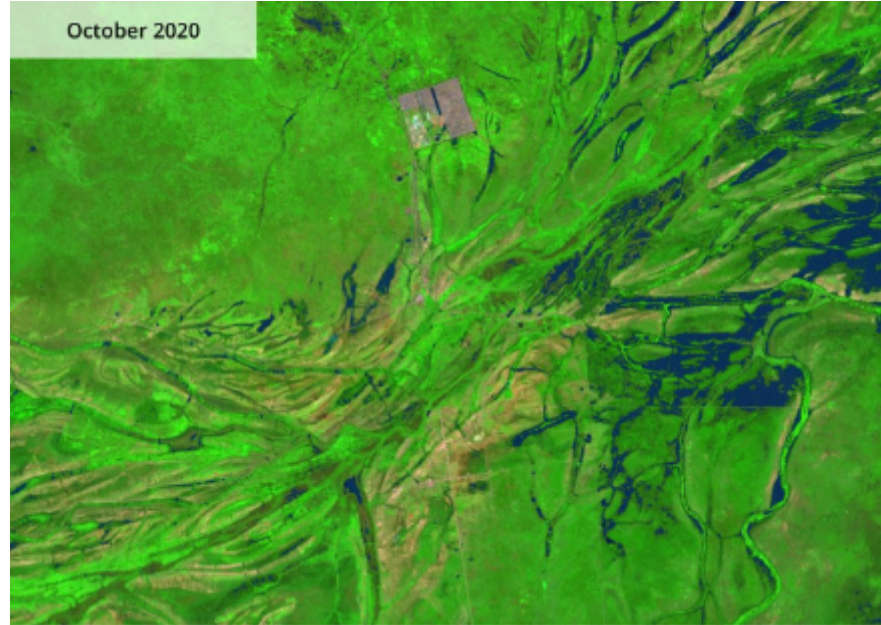
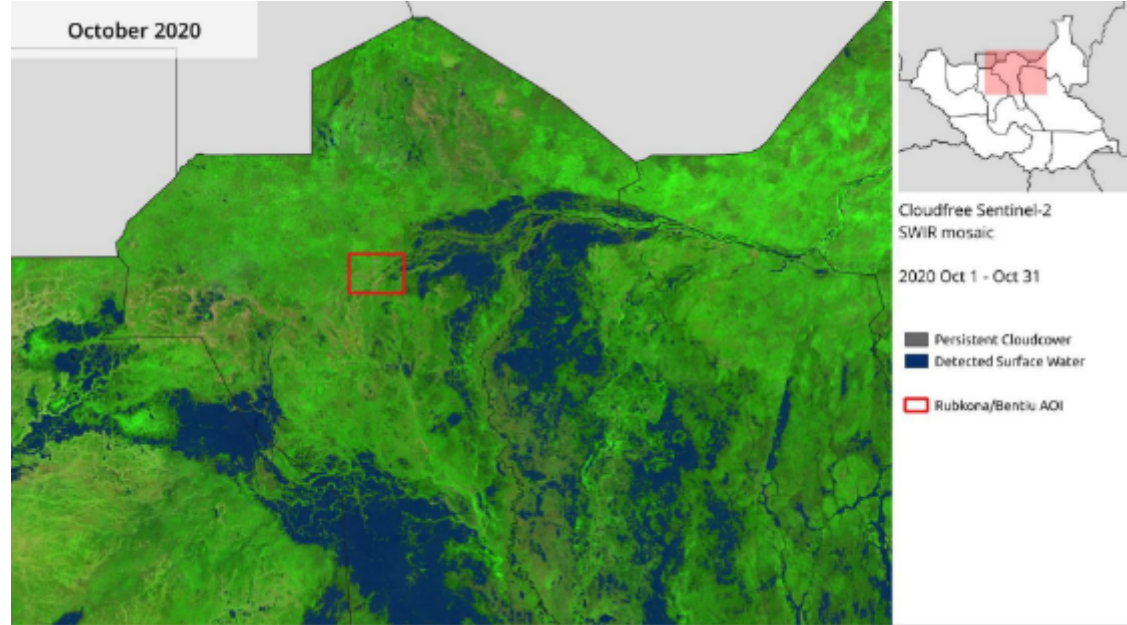


*Aerial view of New Fangak*

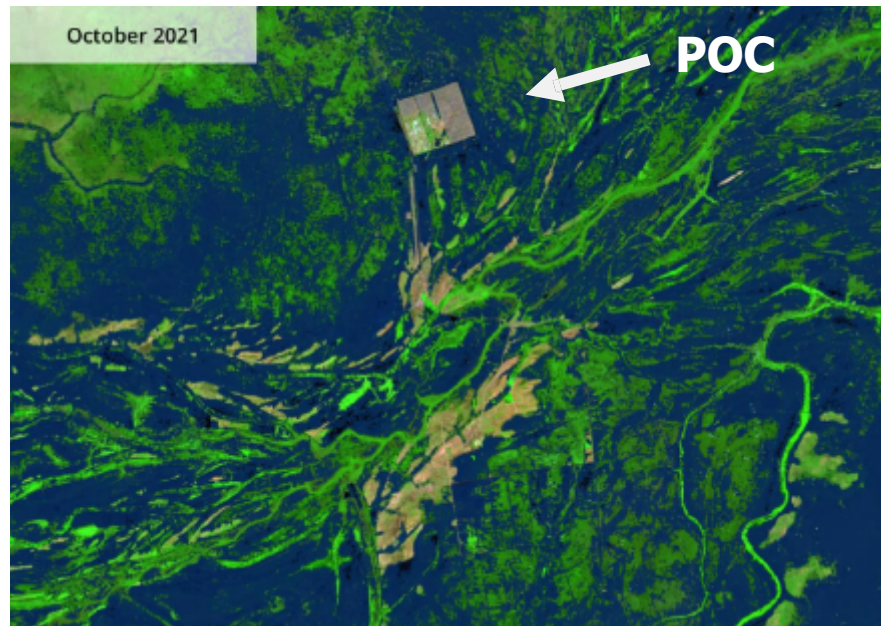
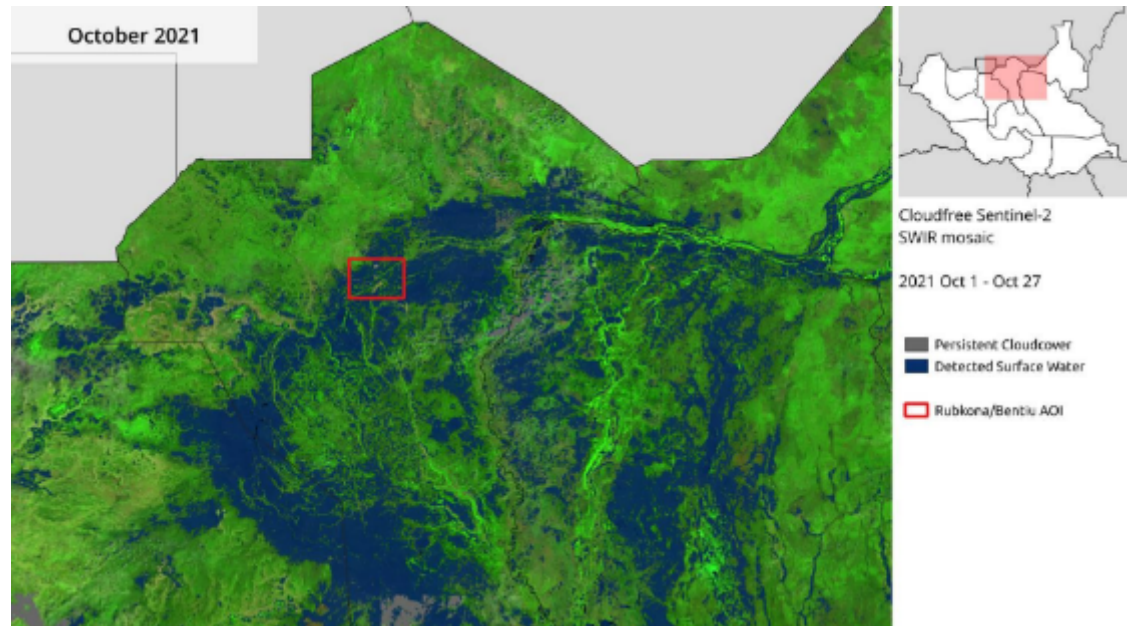


*Women preparing water lilies for cooking*





The maps show a comparison of satellite imagery - 17<sup>th</sup> Oct 2020 and 17<sup>th</sup> Oct 2021.



While surroundings of Bentiu/Rubkona are largely dry in 2020, with minor open water surfaces visible within the seasonal water courses, extensive flooding is observed in 2021.



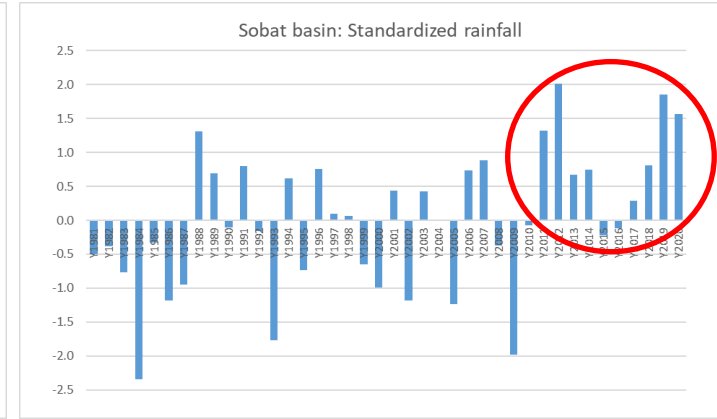
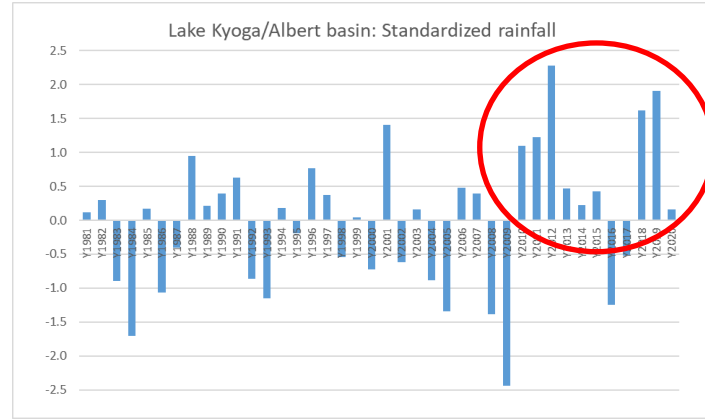
*Submerged and destroyed shelters, Rubkona*



*WFP Logistics conducting an assessment of the roads' conditions in Rubkona and Guit counties*

# DRIVERS OF FLOODING: Nile & Sobat Catchment Rainfall

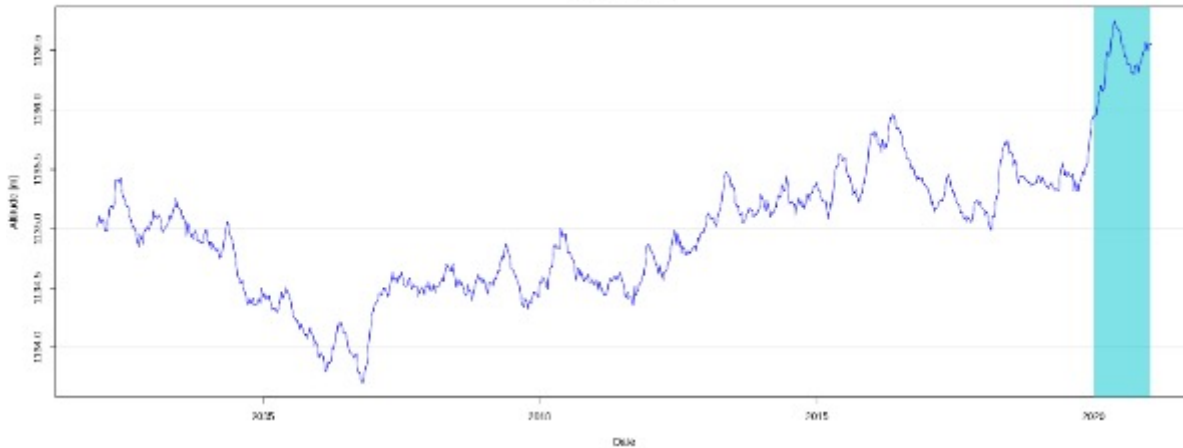
- The **higher catchments of the Nile (Lake Victoria, Lake Albert / Kyoga and Sobat basins), are going through a multi-year wetter than usual phase since 2010.**
- Four or five of the six wettest years in a 40-year record have taken place during this period. **2018 and 2019 in particular, were some of the wettest on record, with extremely intense rainfall.**
- This excess water has increased Nile flows into South Sudan driving a much-enhanced flood risk.



Annual rainfall in the Lake Kyoga/Albert basin in Uganda (left) and the Sobat basin in Ethiopia (right). Rainfall is expressed in standard deviations off the mean. Values above +1 or below -1 would be expected to occur once every six years on average. Note how the +1 value has been consistently exceeded since 2010

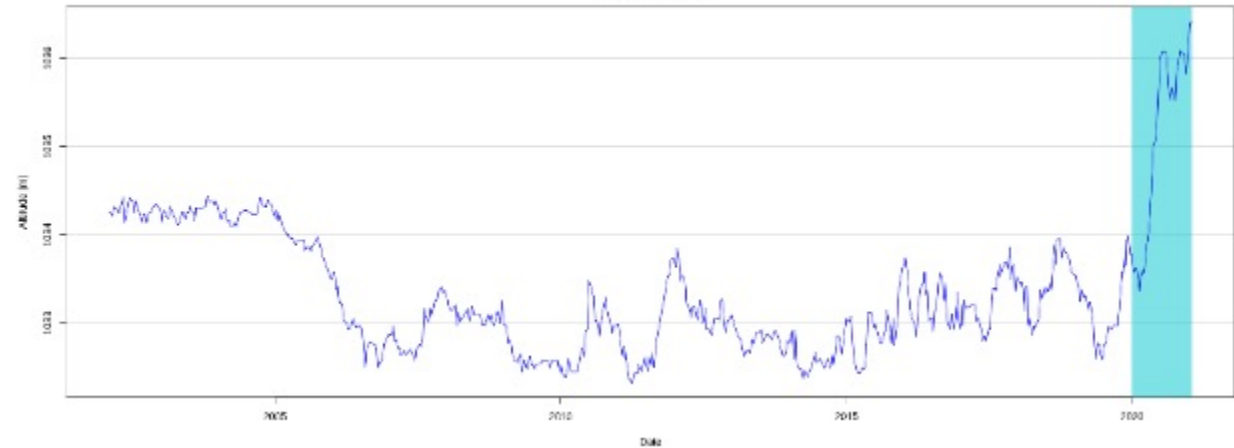
### Lake Victoria Height

Water Level (DAHITI Satellite Altimetry)  
2021-01-10 - ID 2



### Lake Kyoga Height

Water Level (DAHITI Satellite Altimetry)  
2021-01-15 - ID 215



“The Zurich Flood Resilience Alliance is a multi-sectoral partnership focusing on finding practical ways to help communities in developed and developing countries strengthen their resilience to flood risk.”

In partnership with:



Working in 28 countries across the World



Theory of change around:

1. Climate smart flood resilience risk informed practice
2. Increase in equitably disbursed funding
3. Implementation of laws, plans, policies & practices

Countries where we:  
 ■ Implement a full flood resilience programme ■ Have a limited programme to improve flood resilience policy ■ Have carried out a Post-Event Review Capability to learn from a disaster  
\*As of 1st January 2021



# Piloting a flood resilience measurement in communities (FRMC) framework

## FRMC approach:

- ❑ Piloted in Aweil West & Aweil North counties in July 2020
- ❑ Extended 2021 to 5 additional communities per each county

### 1. Community scoping work in the past 12 months:

- ❑ mapping hazards, flood trends & pathways, transect walks, resource mapping, traditional early warning system mapping, community visioning;

### 2. Community vision statements used as a springboard to attaining resilient communities

### 3. Data collection (HH survey/ FGD/ KII/ secondary data: used to inform & understand the root causes of vulnerability to floods, not just symptoms.

#### 3.1 Communities with large population clustered/ zoned into sub-studies to ensure representativeness



| Year | Flood Impact    | Crop damage % | Livestock diseases % | Community displacement % | Destruction of households % | Human diseases % | Average |
|------|-----------------|---------------|----------------------|--------------------------|-----------------------------|------------------|---------|
| 1998 | Severe flooding | 70%           | 50%                  | 80%                      | 85%                         | 40%              | 65%     |
| 1999 | Severe flooding | 65%           | 40%                  | 70%                      | 70%                         | 30%              | 55%     |
| 2001 | Severe flooding | 50%           | 55%                  | 65%                      | 60%                         | 20%              | 50%     |

# FRMC approach in South Sudan continued:

4. **Quality review:** grading sources of resilience under 5 livelihood capitals;
5. **Community validation:** Report shared with communities for validation & evidence used to inform participatory design of programme
6. **Advocacy:** support enactment of laws & by-laws and enhance existing climate change & DRR policies by stakeholders at local, sub-national and national level
7. **Funding:** advocacy supports financial commitments to flood resilience from stakeholders.
8. **National theory of change:** then developed once data collected & community needs identified;
9. **Community projects:** flood risk awareness raising & sensitization conducted at peak of rainy season; aim to mitigate flood risks e.g. snakebites, drowning, water-borne diseases etc.



# WFP/FAO Funded LEAP & BRACE Projects- Upland rice production piloting to mitigate floods



NORWEGIAN  
REFUGEE COUNCIL



# Climate Adaptation/ Turning calamities into opportunities

- NRC and ADRA under their WFP/ FAO funded projects in Twic and Tonj Counties (Warrap State) established **vegetable gardens which failed due to flooding/ waterlogging** – year after year
- **Flood control dykes were constructed every year but were not a sustainable solution** to the flooding/ waterlogging problems
- NRC/ ADRA decided to **diversify crop production** by piloting on crops that were flood/ drought tolerant but also able to cover food security needs for households such as upland rice & orange fleshed sweet potatoes
- **RICE was the crop of choice** due to its flood/waterlogging tolerance & many farmers preferred it due to this characteristic

## PICTURES



Farmers preparing planting holes for transplanting rice



Harvesting time



Rice Field

## Achievement and future outlook

- In Twic County, upland rice production was **first piloted by NRC in 2019** with support from FAO which provided direct seeds through BRACE II 16 months initially planting in 5 *feddans*
- By **2021 upland rice production had expanded** and increased acreage to a total of 17 *feddans* cultivated in 3 Bomas; Mangok Amuol 8 Feddans, Ayien Boma 7 *feddans* and Maper Boma with 2 Feddans.
- In Tonj County, ADRA first piloted upland rice production in 2021 covering approximately 1 *feddan* for trial and seed multiplication purposes
- There has been a lot of **interest by farmers, for 2022** the area under upland rice production is expected to be greatly increased

# Anticipated output & effects:

## HH food security:

- Baseline = zero yield from sorghum in waterlogged soils
- Rice yield from adaptive practice (**adapted to changed waterlogged environment**)
- Reduced expenditure / sale of livestock from **rice yield substituting for sorghum**
- Option to **generate income** by selling rice if HH needs dictate
- Encouragement & **adoption** by other sorghum growing farmers for **rice area expansion in 2022**

## Research & learning:

- Calculation of gross margin = yield – cost; how then does it compare to sorghum; of great interest here is labor (a scarce commodity for many ‘vulnerable’ farmers); **how feasible is rice production especially for most ‘vulnerable’ HHs?**



Rice field

Drying and threshing



Post-harvest handling & storage



## Challenges:

- Extent, scale & magnitude of **three consecutive years of atypical 50 – 60 year floods ... 2022??**
- **Impoverished population** with existing vulnerabilities:
  - (8.3 million PiN in 2021/ 60% population IPC3+/ crisis induced poverty levels >80%/ continued protracted crisis with compounded shocks: food prices, conflict, floods, dry spells etc.)
- Collapsed infrastructure, economy & livelihoods;
- Reduced humanitarian funding focus on life saving; **insufficient funding for disaster risk reduction;**

## Recommendations:

- **Advocacy** with resource, humanitarian & development partners (joined)
  - **Promote DRR & adaptation** pilots for scaling up
- **Expand existing dyke rehabilitation** and road construction
  - **Peace, Rule of Law, Unity & improved governance**