



# Community and Technology inter-linkages for Drought Risk Assessment and Monitoring in Kenya

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# Drought Early Warning System (EWS)

- ▶ 80% of Kenya is vulnerable to drought
- ▶ The EWS of the NDMA aims to give information that help trigger interventions to respond to drought in a timely manner.
- ▶ The system is community based, with data collected at the household level
- ▶ To achieve this, triangulation of indicators to characterize drought conditions, including **trends** and **specific thresholds** are critical

# Drought Indicators

- **Physical indicators**

Rainfall, Effective soil moisture, Surface water availability, Depth to groundwater, etc.

- **Biological/ Agricultural indicators**

Vegetation cover & composition, Crop & Fodder yield, Condition of domestic animals, Pest incidence, etc.

- **Social indicators**

Food and Feed availability dietary diversities, Land use conditions, Livelihood shifts, Migration of population, Markets operations, resource conflicts, etc.

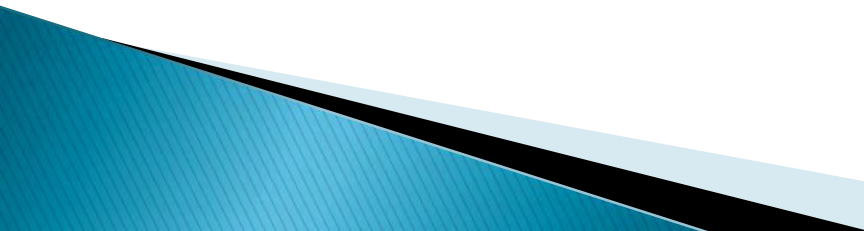
# Current Early Warning System Model of NDMA

Takes household as unit of analysis considering different livelihood polygons and looks at 3 different categories of indicators;

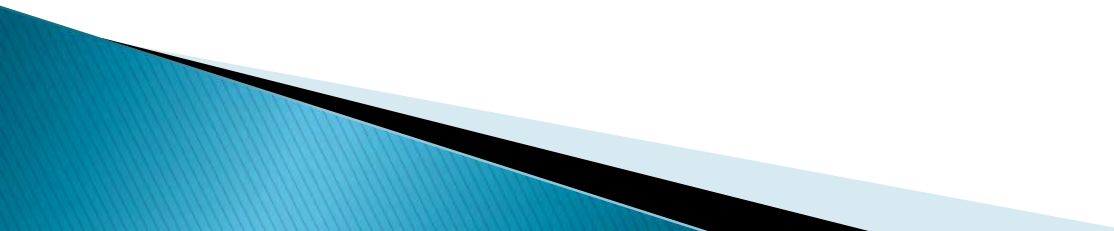
## 1. Environmental Indicators

- ▶ They give trends on the environmental stability
- ▶ Rainfall: onset, quantity, spatial distribution, temporal distribution
- ▶ Forage (Pasture and browse) in terms of quality and quantity – trends
- ▶ Water sources: changes in water sources, distances traveled

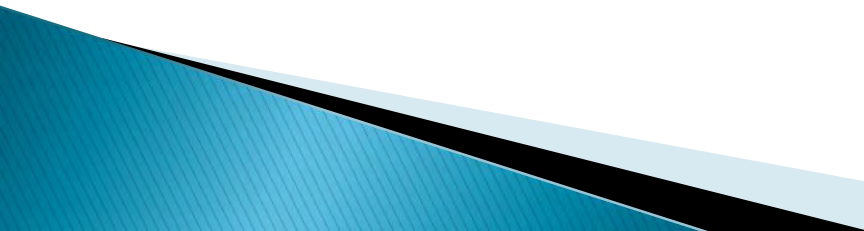
## 2. Rural Economy Indicators

- ▶ They measure food availability and effects to food security
  - ▶ Livestock body condition in various areas
  - ▶ Livestock diseases
  - ▶ Timeliness and condition of various crops in different livelihood zones
  - ▶ presence of crop pest and diseases
  - ▶ Productivity: Livestock and Crops
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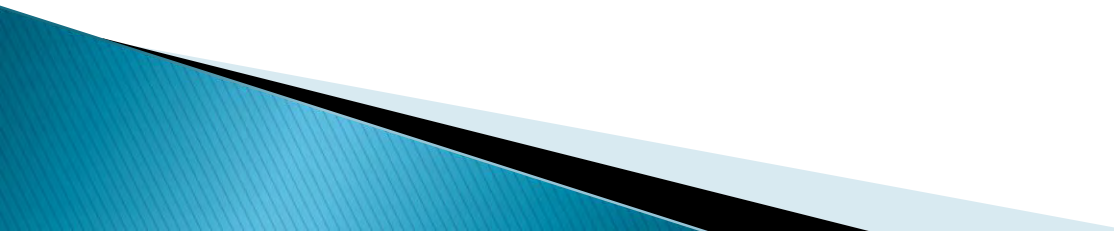
# 3. Human Welfare Indicators

- ▶ Measure access and utilization of food
  - ▶ Market prices; Prices of livestock, food crops. Terms of Trade (ToT)
  - ▶ Markets Functionality
  - ▶ Trends in food consumption scores and availability at household level
  - ▶ Health and Nutrition: Nutritional status of children 12–59 months – (MUAC Measurements)
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# Data Collection (Currently)

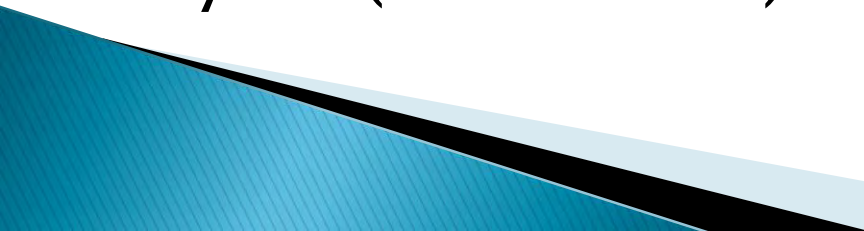
- ▶ Collected across sentinel in 23 counties by field monitors
  - ▶ There are appx. 334 Sentinel sites across the area covered each with 1 enumerator (Field Monitor)
  - ▶ Data from the setinel sites is used to inference what happens in other areas of the livelihood
  - ▶ Household Data Collection – Questionnaires (HHA)
  - ▶ Community Key Informants questionnaires(KIA)
  - ▶ Observations
  - ▶ Secondary Data – Trends Building
  - ▶ Use of Geo Technology (RFE and NDVI) limited
  - ▶ Analysis done and monthly bulletin produced example
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# Sampling

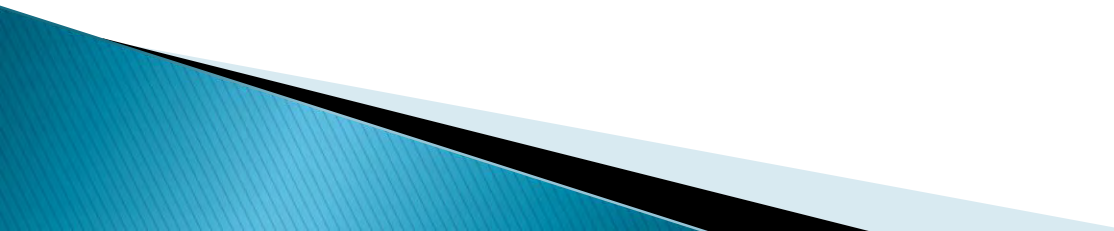
- ▶ **Purposive sampling;**
  - ▶ Used in selecting the areas to be used as a sample unit
  - ▶ The sample unit is selected purposively to meet a certain criteria.
  - ▶ Population Distribution and Density
  - ▶ Geographic Scatter of the area
  - ▶ Security
  - ▶ Accessibility
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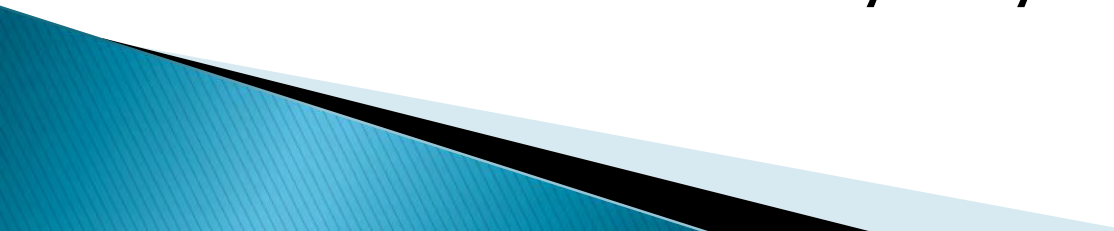
# Sampling

- ▶ **Random sampling;**
  - ▶ used to select households to be used as sampling units
  - ▶ In this all the households stand an equal chance of being selected
  - ▶ Total Population of the sample site taken into consideration
  - ▶ Sampling interval determined by 30 Number of targeted respondents
  - ▶ The selected households interviewed for an year (12 months)
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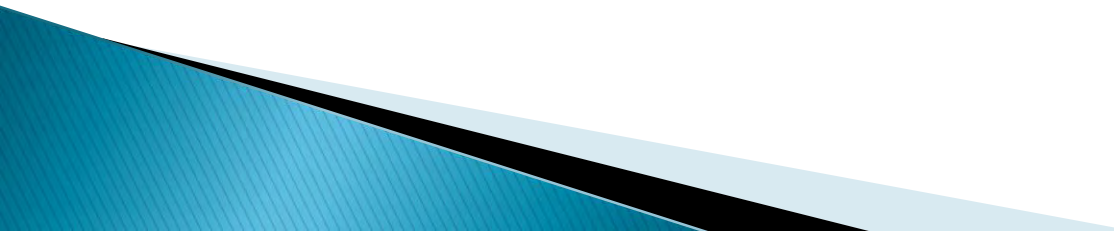
# Current Risk Model

- ▶ Risk = F( Hazard+ Vulnerability)
  - ▶ The risk of a negative outcome, is a function of the probability and severity of a hazard event as it interacts with the vulnerability of people.
  - ▶ The trend in each indicator is monitored with respect to the “normal” range.
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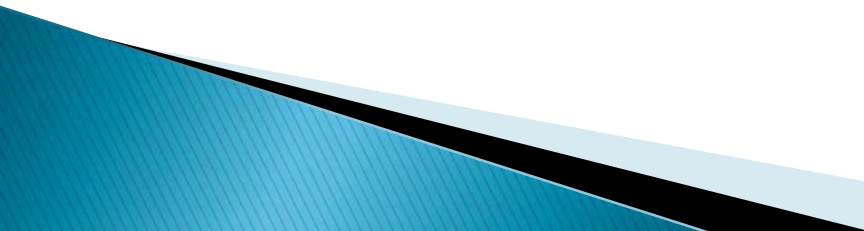
# Current Challenges

- ▶ Vastness and lack of homogeneity of the sample sites and livelihoods
  - ▶ Linking the Current EWS with response (Triggering for Response)
  - ▶ Current Model does not have distinct way to classify alert, alarm, emergency and recovery phases of Drought Cycle
  - ▶ Low capacity of remote sensed data for triangulation at the county level
  - ▶ Limited access to Remote sensed data at national level – Only rely on FEWSNET
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# Proposed improvements / Opportunities

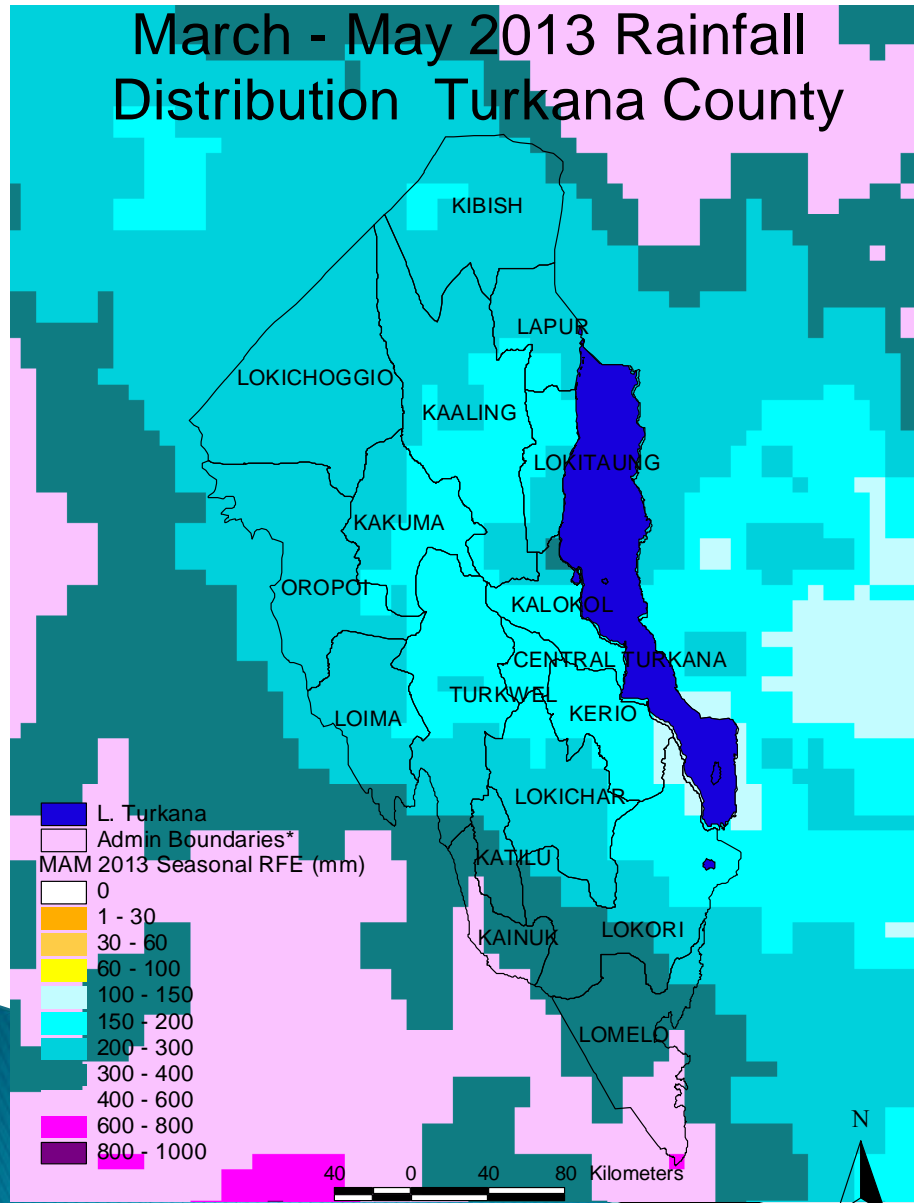
- ▶ The Early Warning Phases will exist; **Normal, Alert, Alarm, Emergency and Recovery**
  - ▶ Access to spatial data for triangulation with the other available data
  - ▶ Drought Early Warning and Impact Monitoring System (DEWIMS) to include new indicators and better ways of collecting data for existing indicators
  - ▶ Create livelihood decision tree based on Geo-spatial, Biophysical and Socio-economic indicators
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# Examples of Use of Geo-technology in Drought Monitoring in Turkana

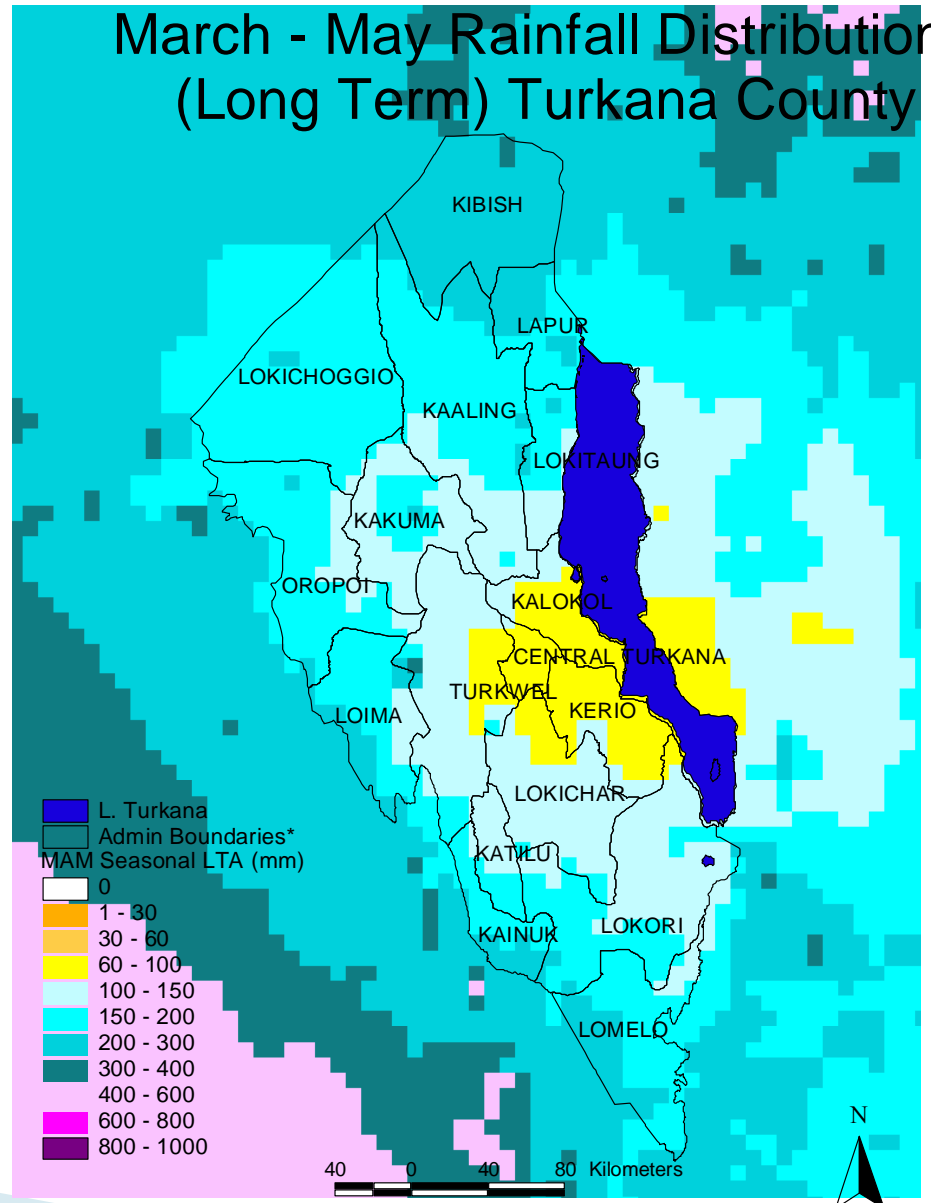
- ▶ Turkana county lies in North West of Kenya, it's the largest in landmass, most vulnerable to drought with highest poverty level index in the country.
  - ▶ March – April May (MAM) Rain Season 2013 rainfall amount was above normal (Slide 14)
  - ▶ Onset late and Cessation Early, – Slide 15
  - ▶ Temporal Distribution Poor– Most rain Falling in April (Slide 15–17)
  - ▶ Overall outcome – WRSI for Rangeland remained poor or improved on western and northern parts which are Insecure grazing areas (Slide 18).
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# Seasonal Averages (MAM)

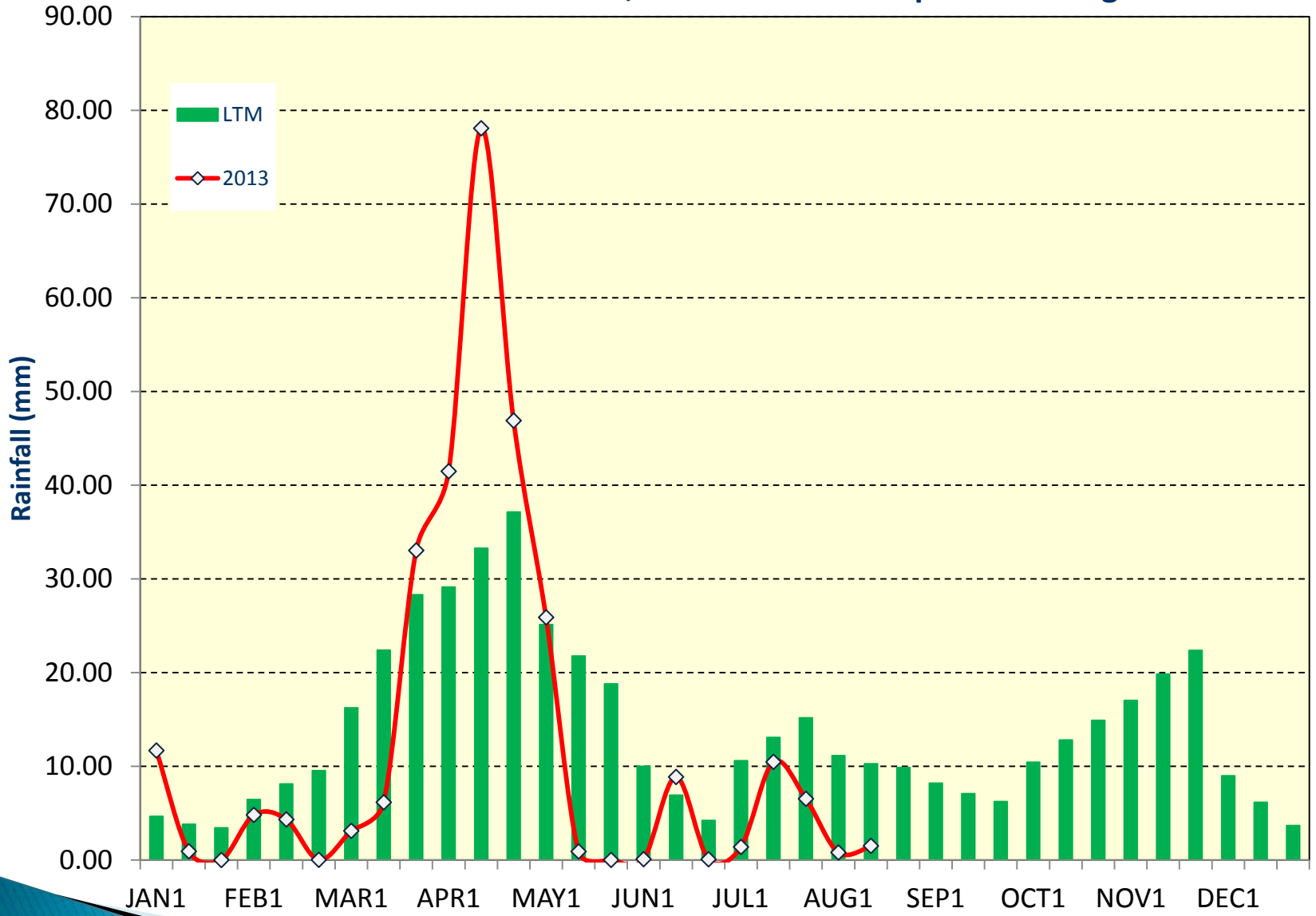
## March - May 2013 Rainfall Distribution Turkana County



## March - May Rainfall Distribution (Long Term) Turkana County



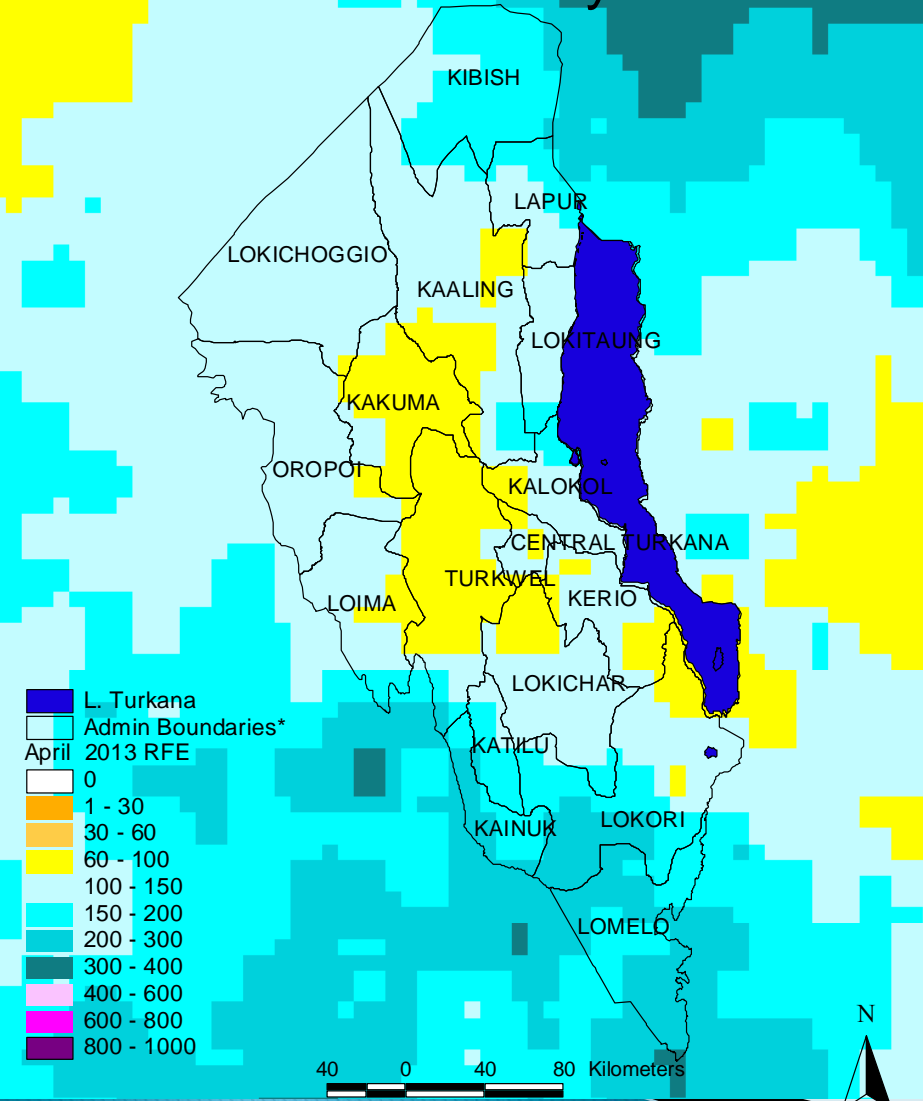
# Rainfall Estimates for Kibish, Turkana 2013 compared to Long term



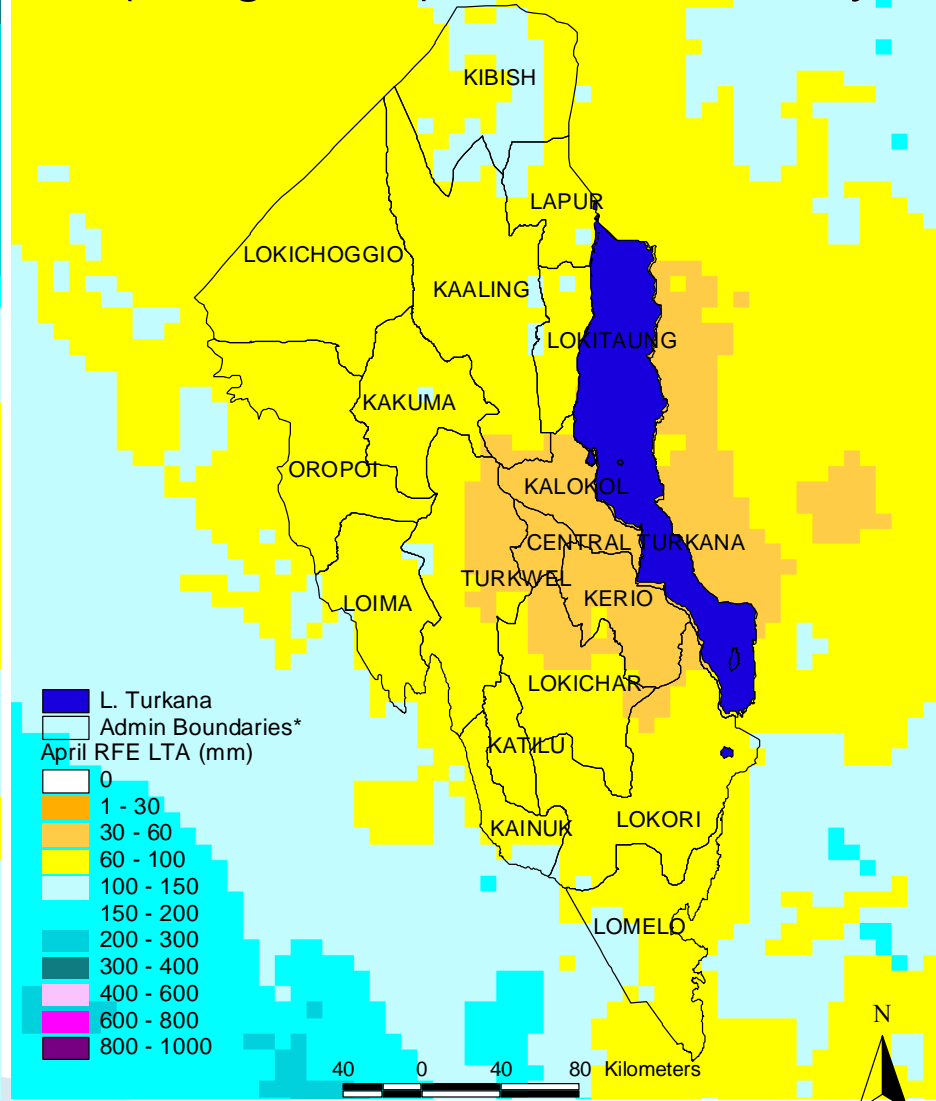
Source: NDMA/FEWSNET

# April Rainfall (Current vs Long Term)

## April 2013 Rainfall Distribution Turkana County



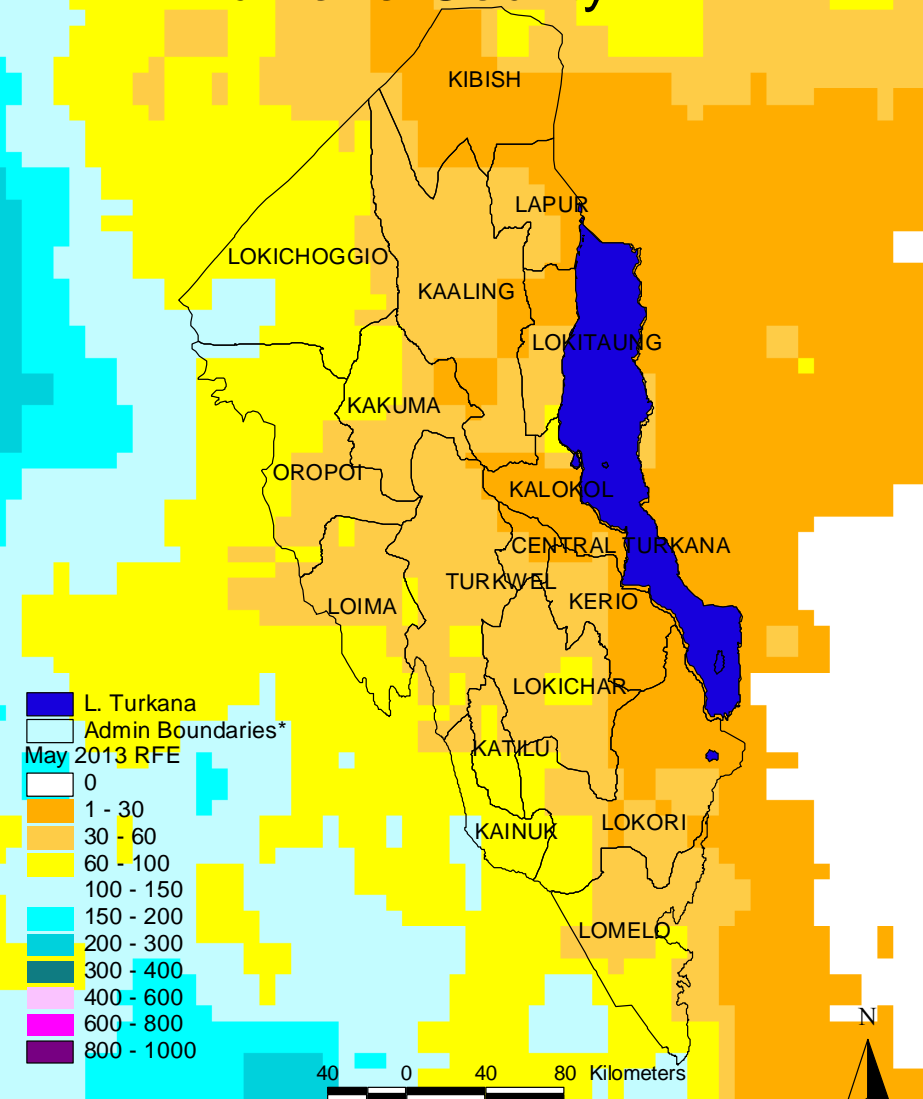
## April Rainfall Distribution (Long Term) Turkana County



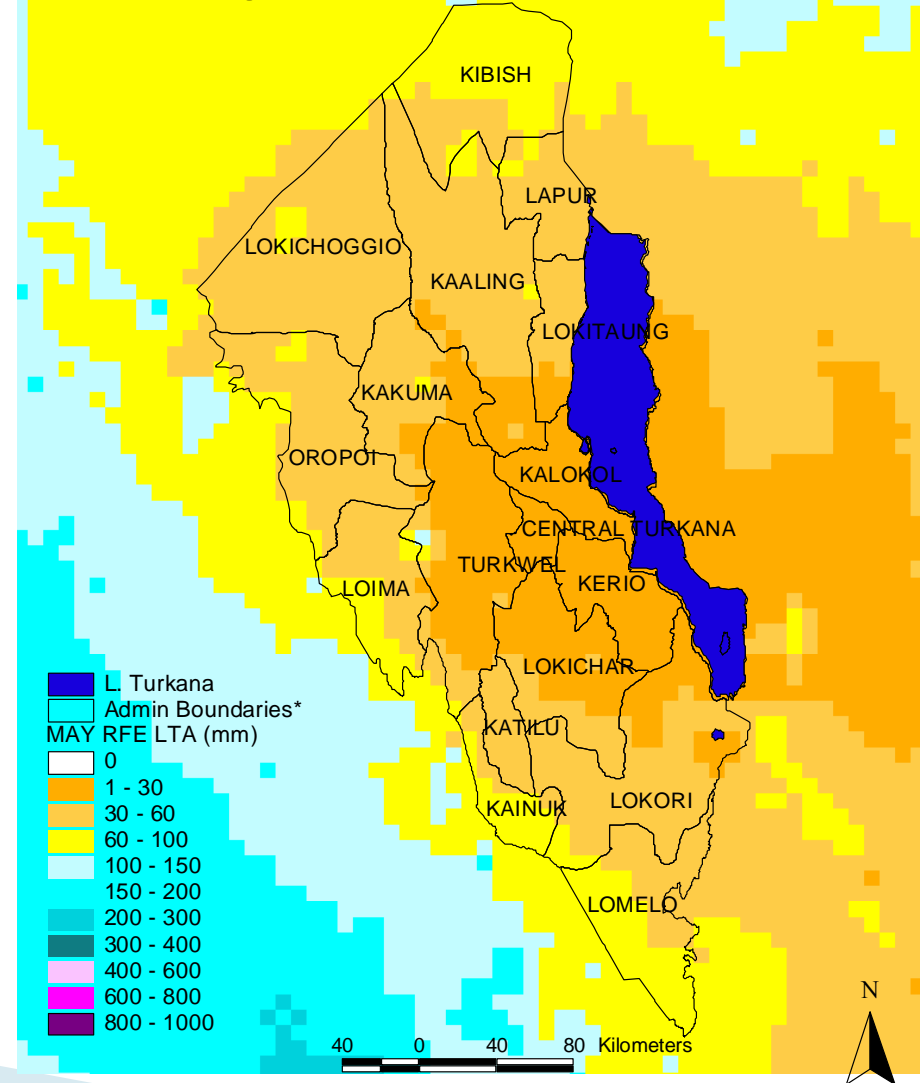


# May Rainfall (current vs Long Term)

## May 2013 Rainfall Distribution Turkana County

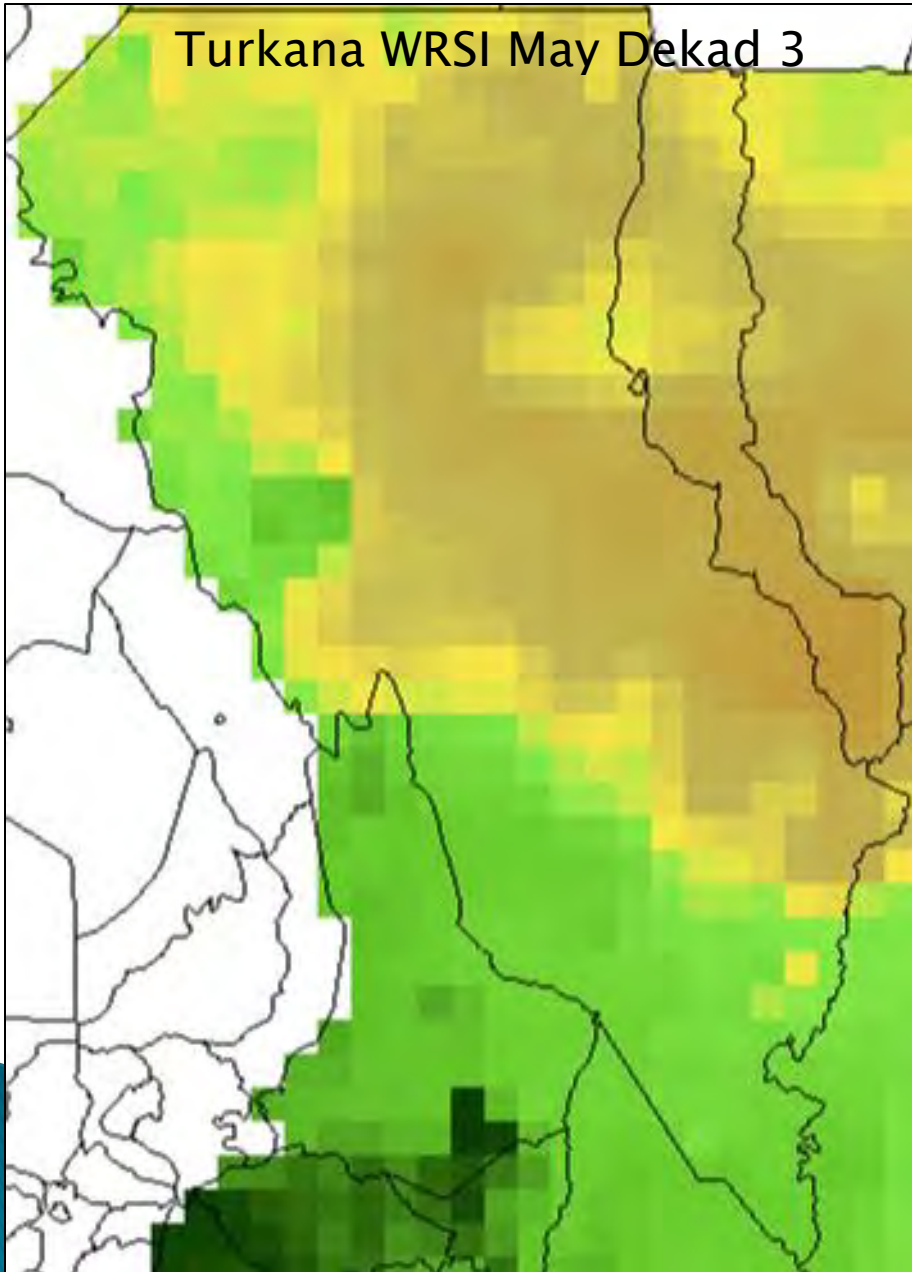


## May Rainfall Distribution (Long Term) Turkana County



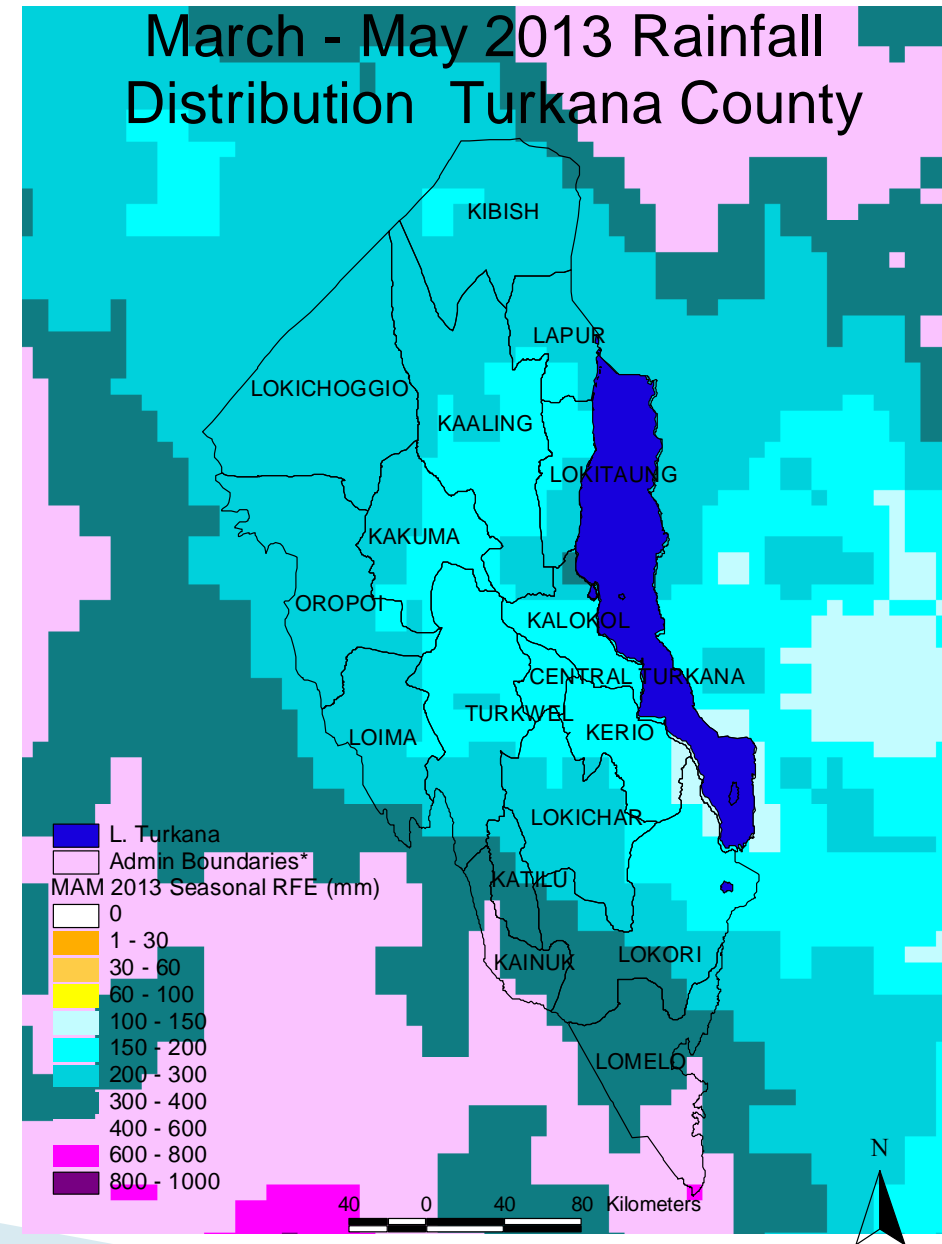
# WRSI

Turkana WRSI May Dekad 3



# RFE

March - May 2013 Rainfall Distribution Turkana County



# Thank You

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