

# Integrating Seasonal Climate Forecasts into Food Security Outlook Analyses

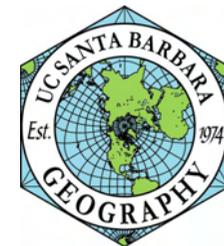
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Global Environmental Change and Food Systems (GECAFS) Conference  
April 2, 2008 - Oxford, UK



## **Famine Early Warning Systems Network (FEWS NET)**

- **FEWS NET is a USAID-funded activity focused on Africa, Central America, Haiti, and Afghanistan**
- **Built on collaboration with international, regional, and national partners**
- **Provides timely and rigorous early warning and vulnerability information on emerging and evolving food security issues**
- **Monitors and analyzes livelihoods and markets to identify potential threats to food security**

# Famine Early Warning Systems Network (FEWS NET)

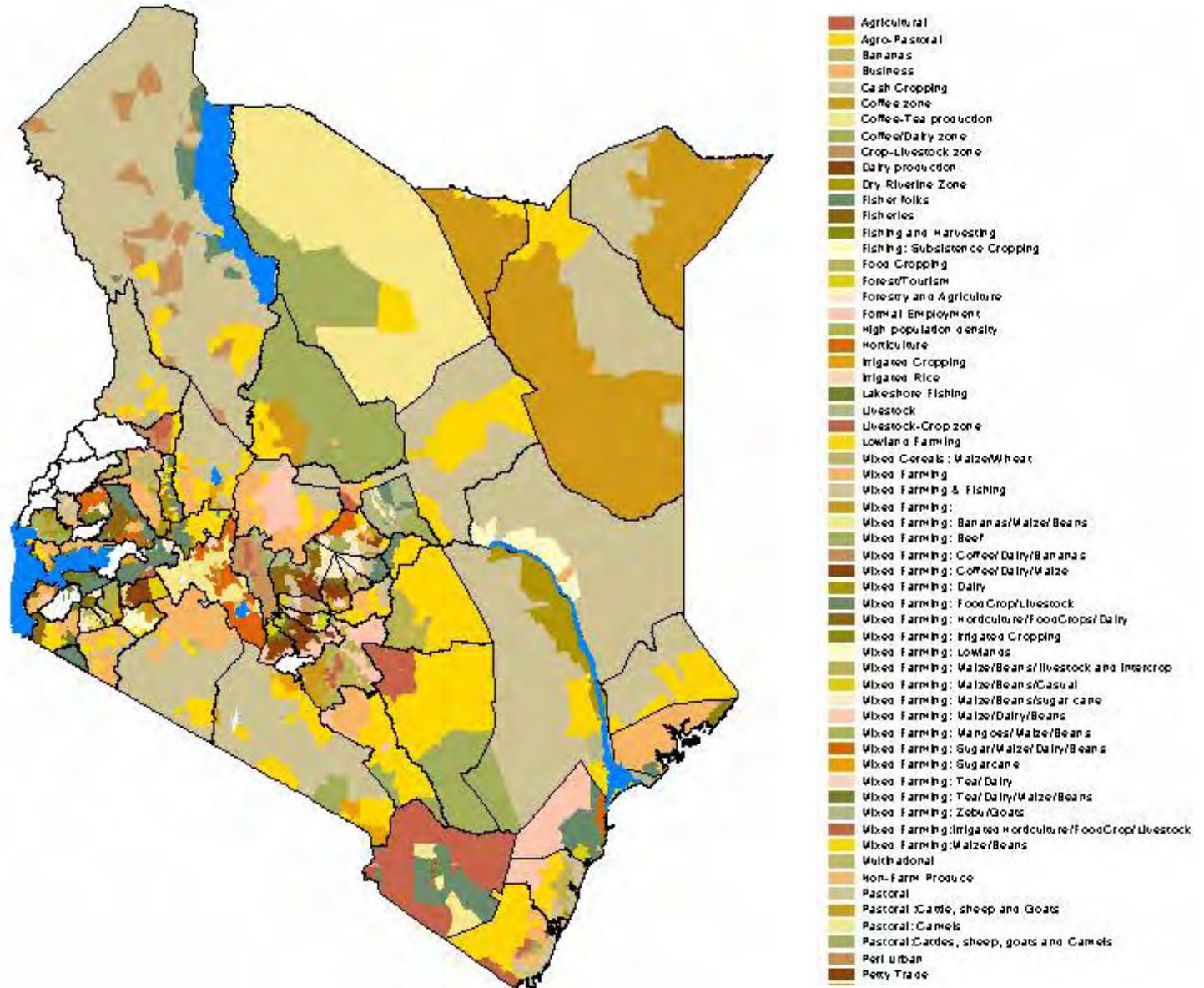
- **Strengthens networks by building capacity and consensus among partners**
- **Produces a suite of communications and decision support products:**
  - **Monthly food security updates for 25 countries**
  - ***Regular food security outlooks***
  - **Alerts**
  - **Briefings**
  - **Other support to contingency and response planning**

# **Famine Early Warning Systems Network (FEWS NET)**

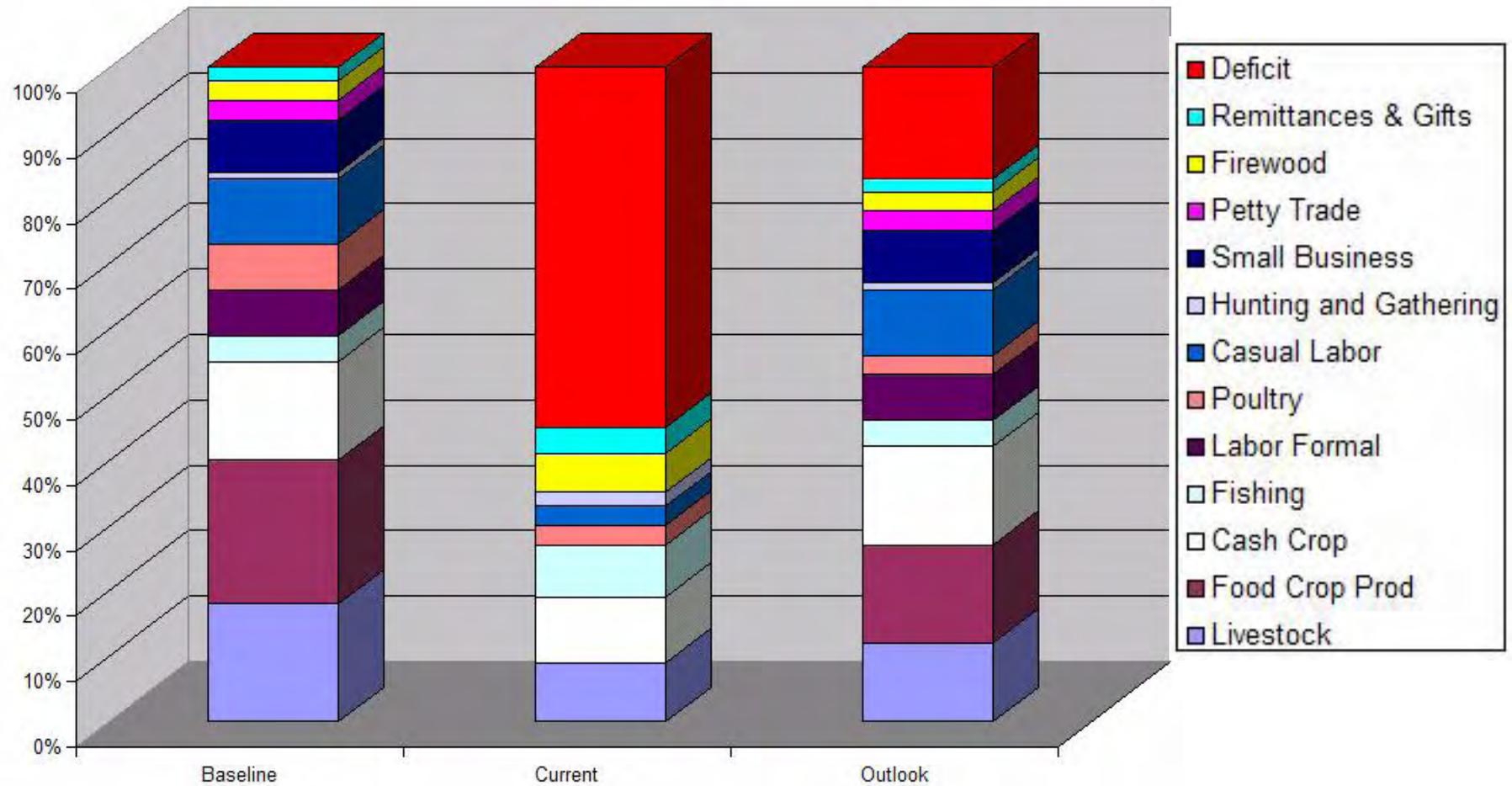
- **FEWS NET employs a livelihoods framework**
- **Livelihood Zone Maps**
  - Delineate geographic areas in which people share the same patterns of access to food, income, and markets
- **Livelihood Profiles**
  - Describe the food and income sources and market access of wealth groups and the hazards to which they are vulnerable
- **Livelihood Baselines**
  - Detailed, quantified breakdowns of household livelihood options that permit assessment of ability to meet basic survival requirements and protect livelihoods



# Kenya Livelihood Zone Map



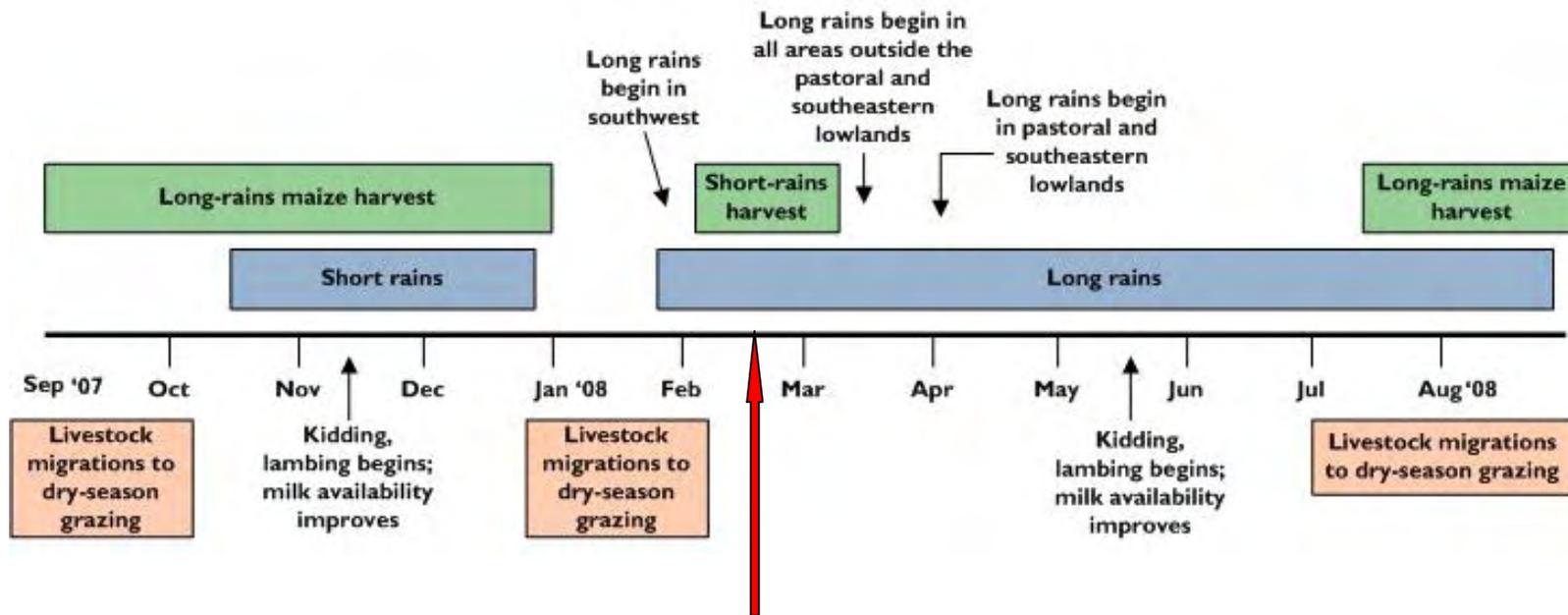
# Example District Livelihood Baseline



# Characterization of Current Status

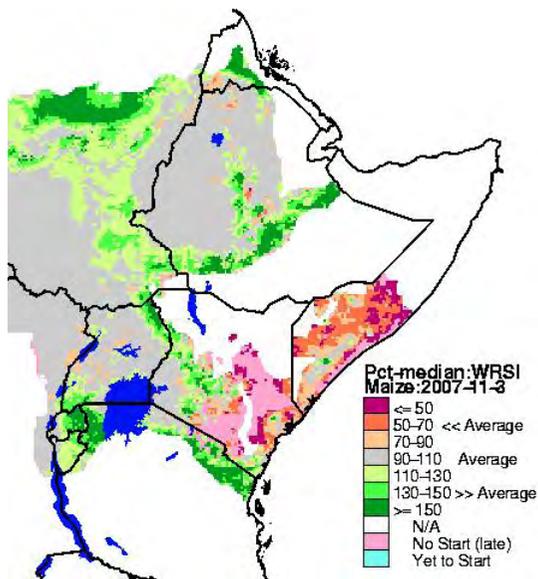
## Timelines of Key Periods and Events

### Kenya

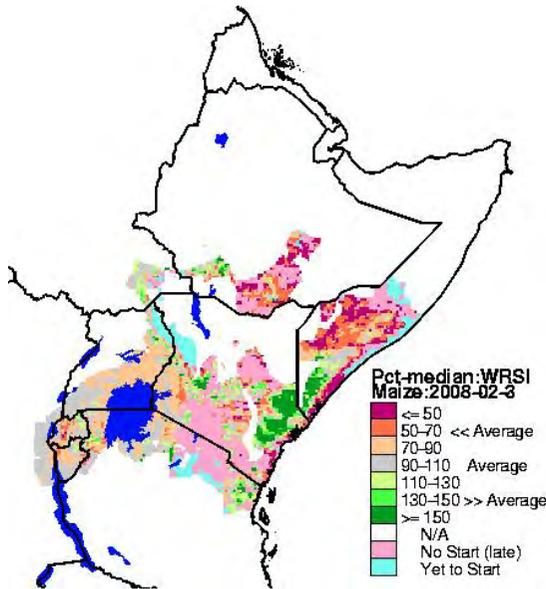


# Characterization of Current Status

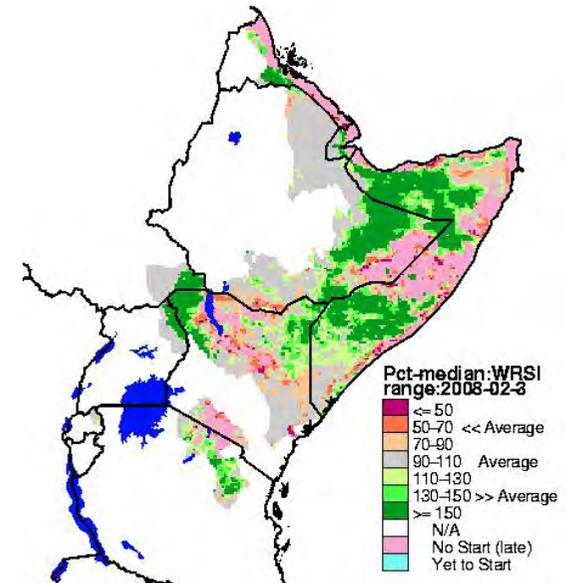
## Recent Harvests and Rangeland Conditions



Long Rains 2007



Short Rains 2007/2008



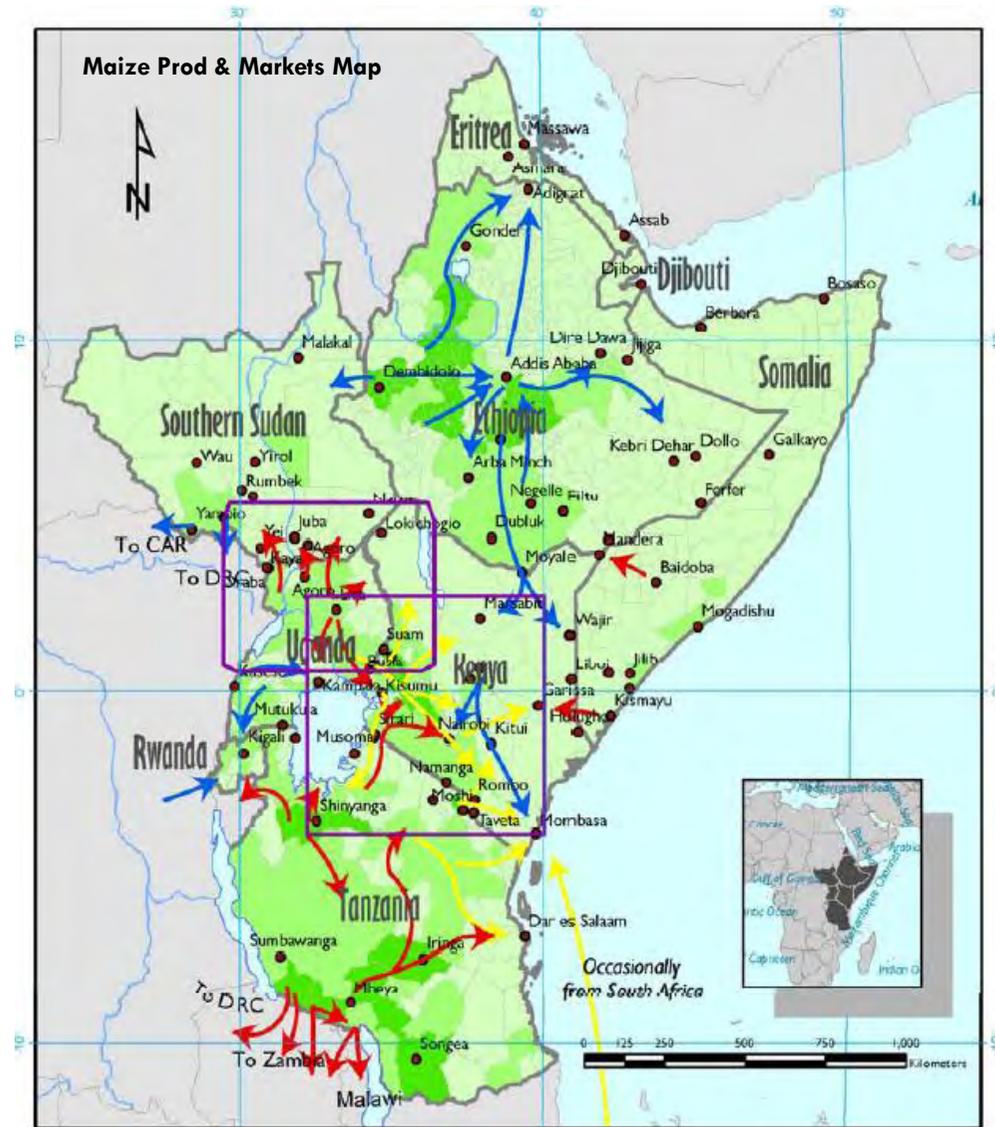
Rangelands Feb 2008

# Characterization of Current Status

## Regional Markets & Trade:

1. Agricultural Production Trends & Impacts
2. Regional / Global Market Prices vs. Constrained Incomes
3. Escalating Global Fuel Prices

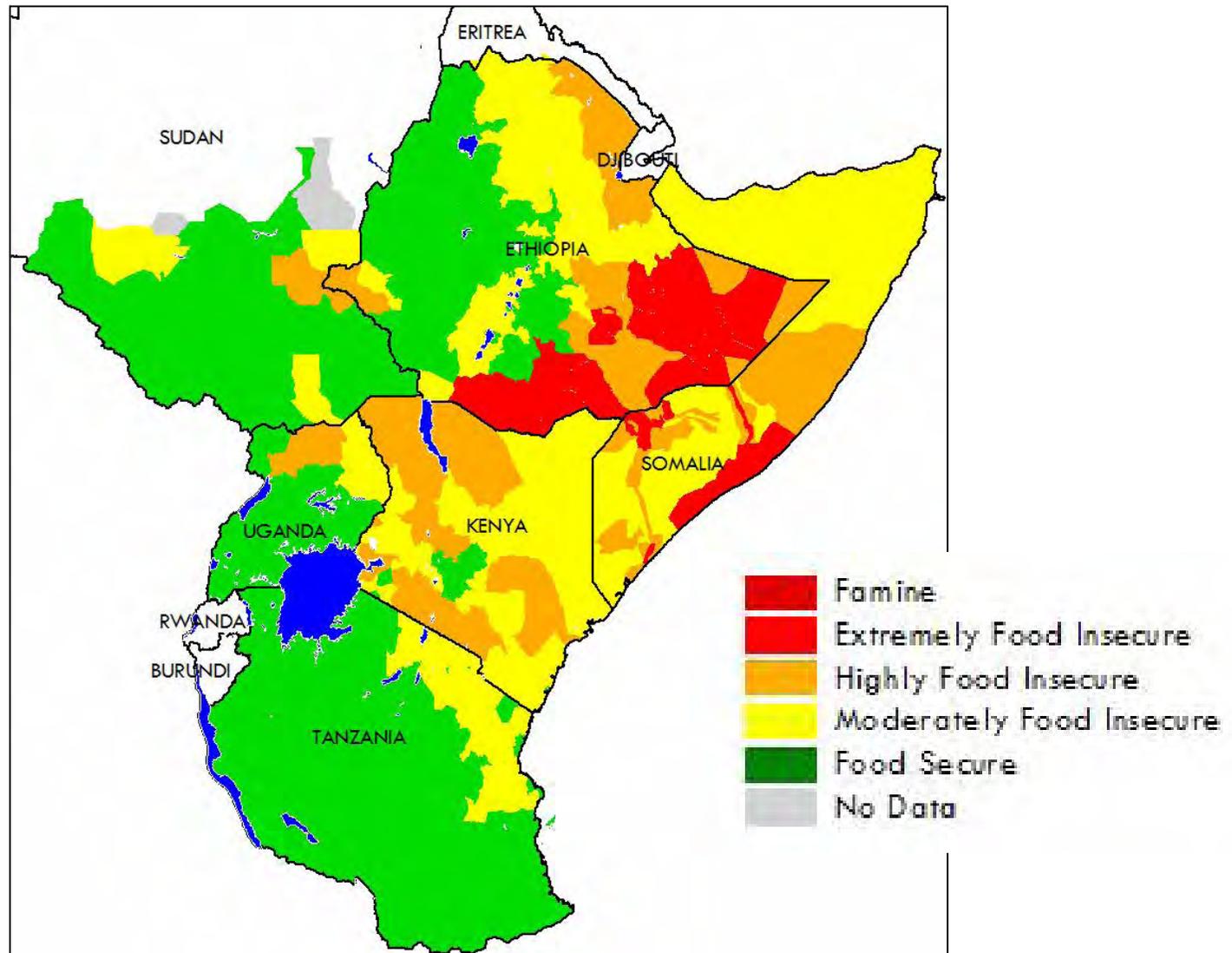
## GHA: Cereal & Livestock Markets & Trade Map



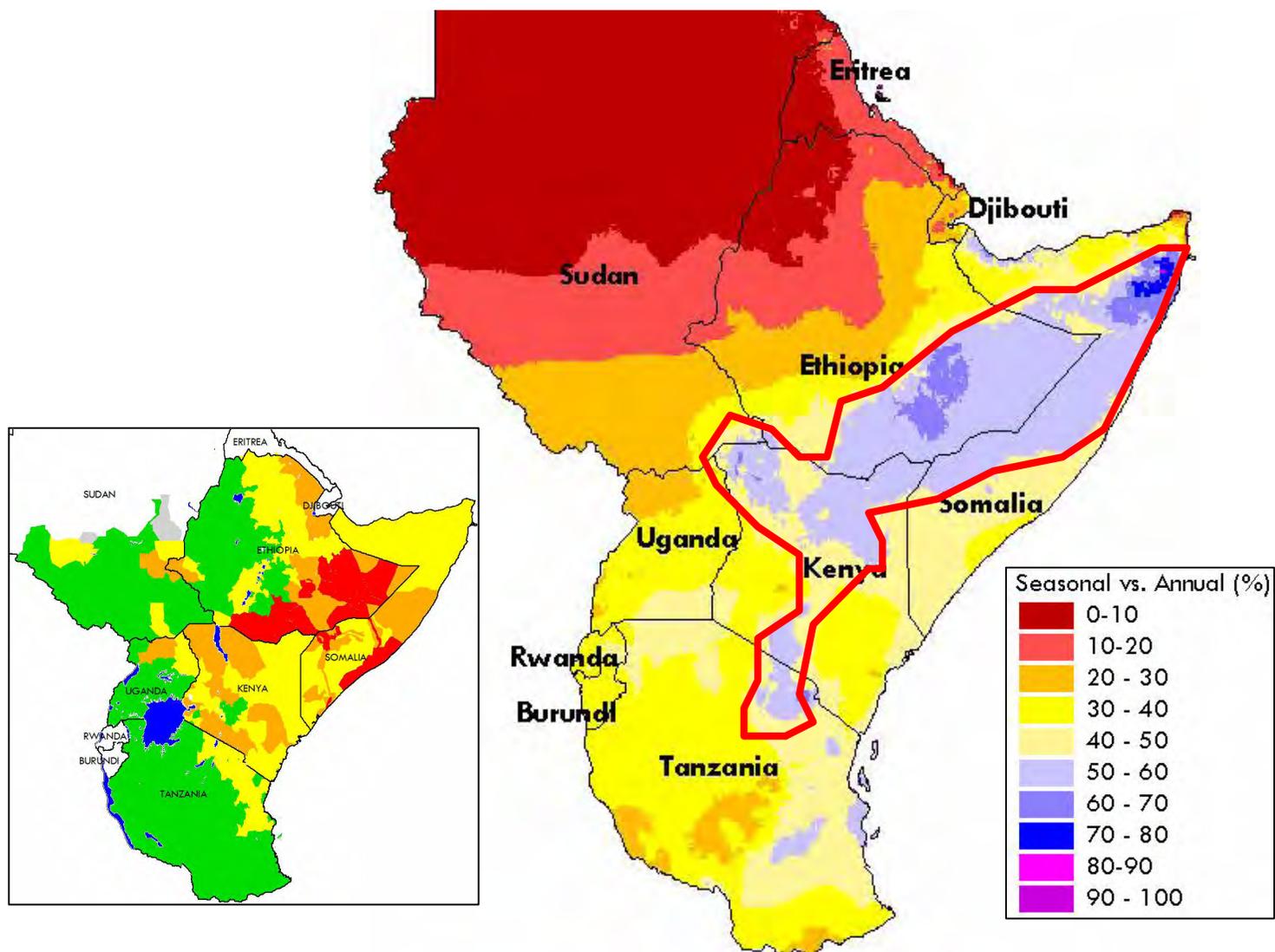
Source: FEWS NET

# Characterization of Current Status

Estimated food security conditions, 1st Quarter 2008 (January-March)



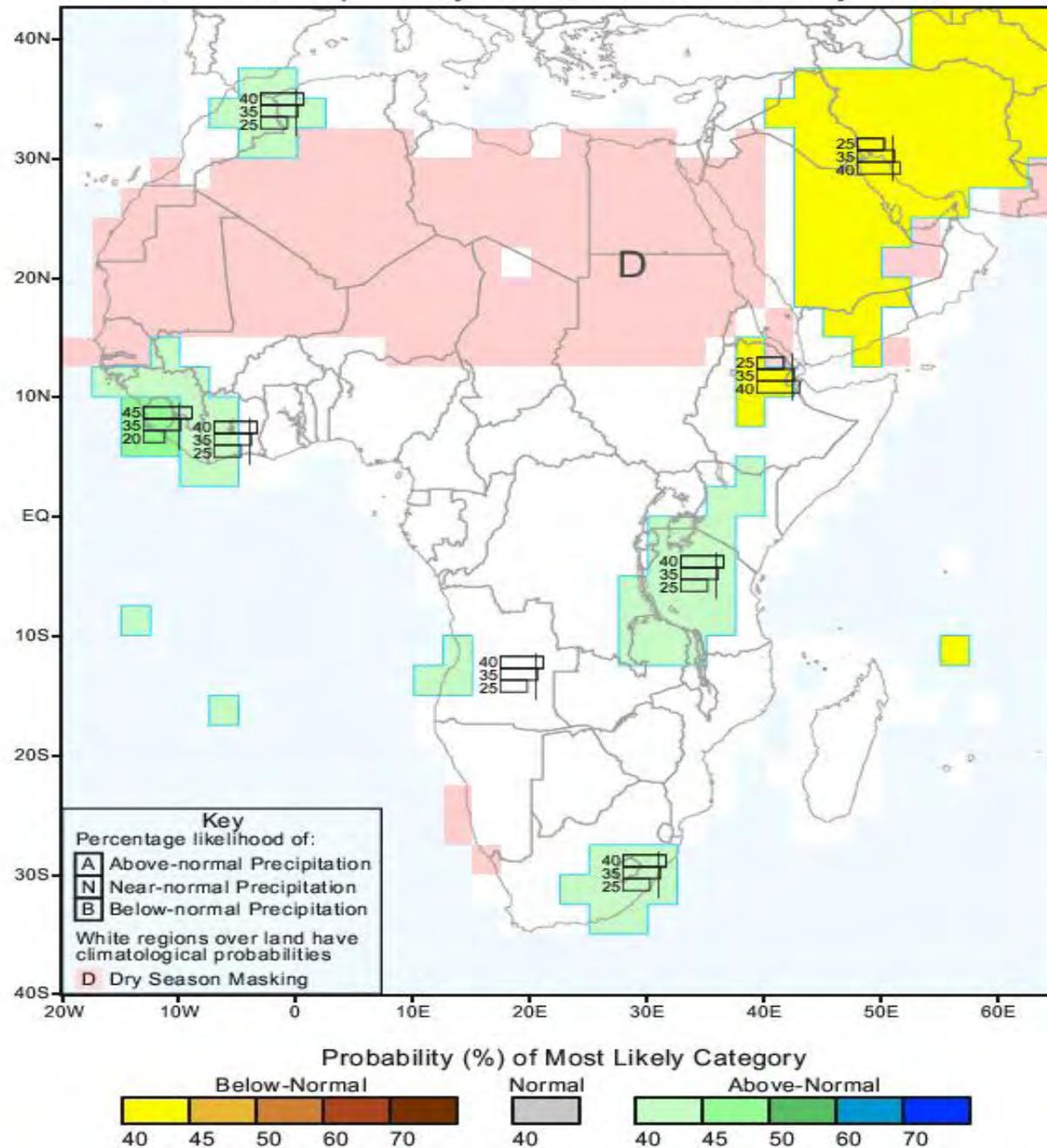
# Significance of the MAM Rains in the GHA



**Identification of High Risk – High Impact Areas & Livelihoods**

# IRI Rainfall Forecast for MAM (Feb 2008)

IRI Multi-Model Probability Forecast for Precipitation  
for March-April-May 2008, Issued February 2008

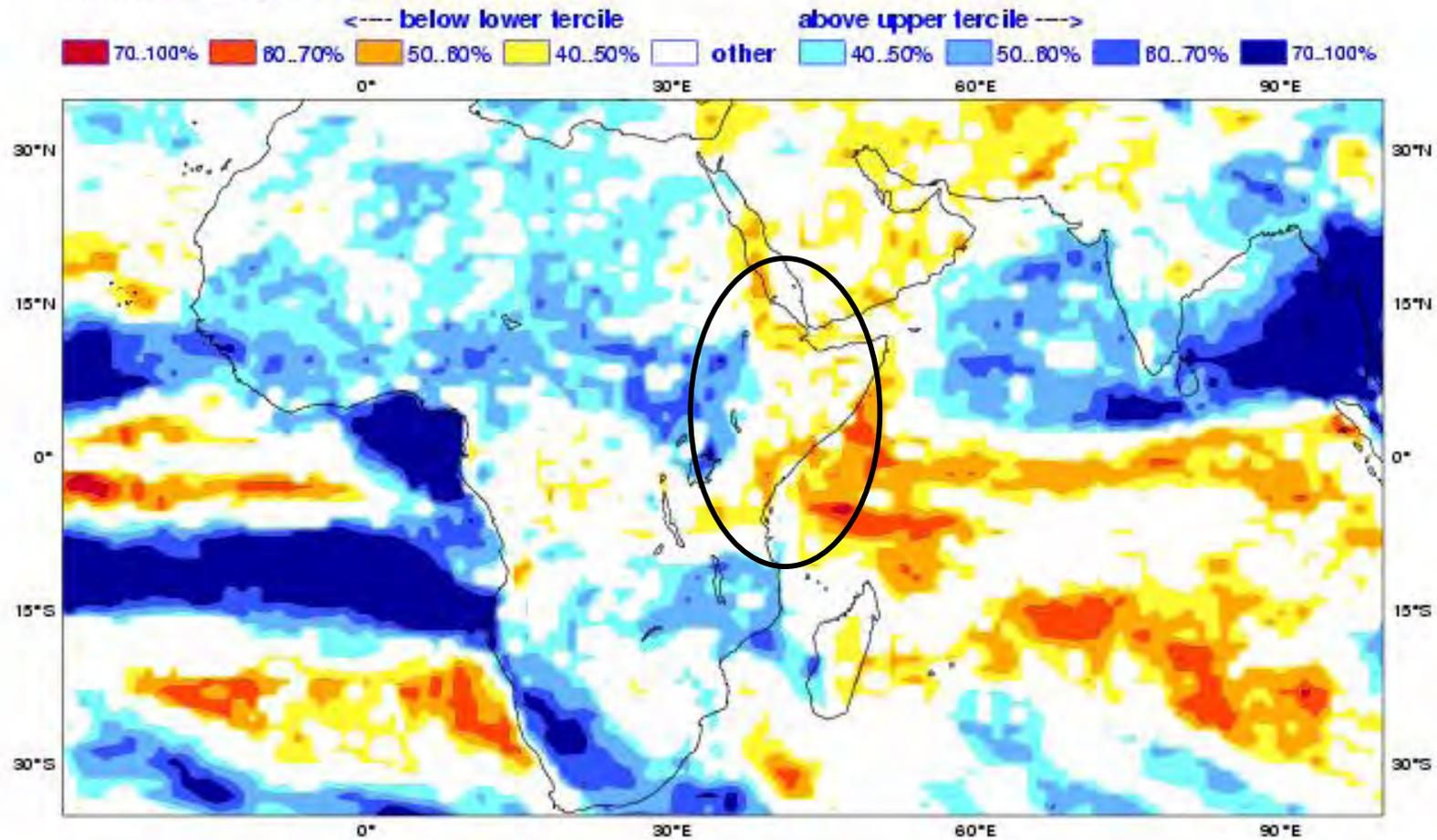


# ECMWF Seasonal Forecast Prob(most likely category of precipitation)

Forecast start reference is 01/02/08  
Ensemble size = 41, climate size = 275

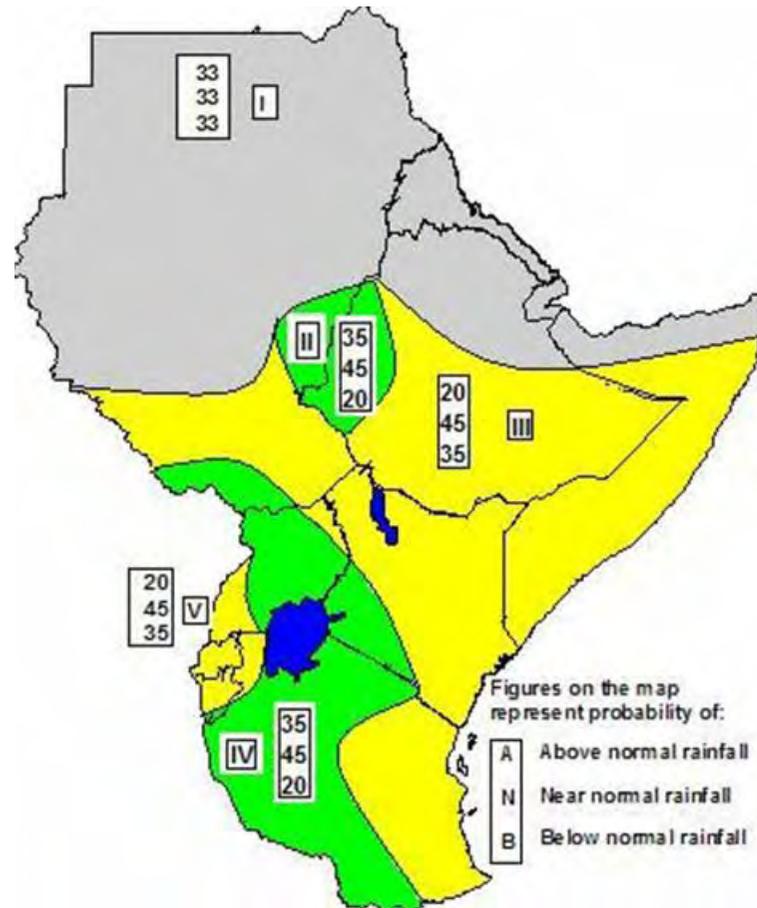
System 3  
MAM 2008

No significance test applied



Forecast issue date: 15/02/2008

## ICPAC Consensus Rainfall Forecast (March – May 2008)

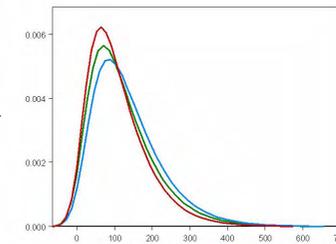
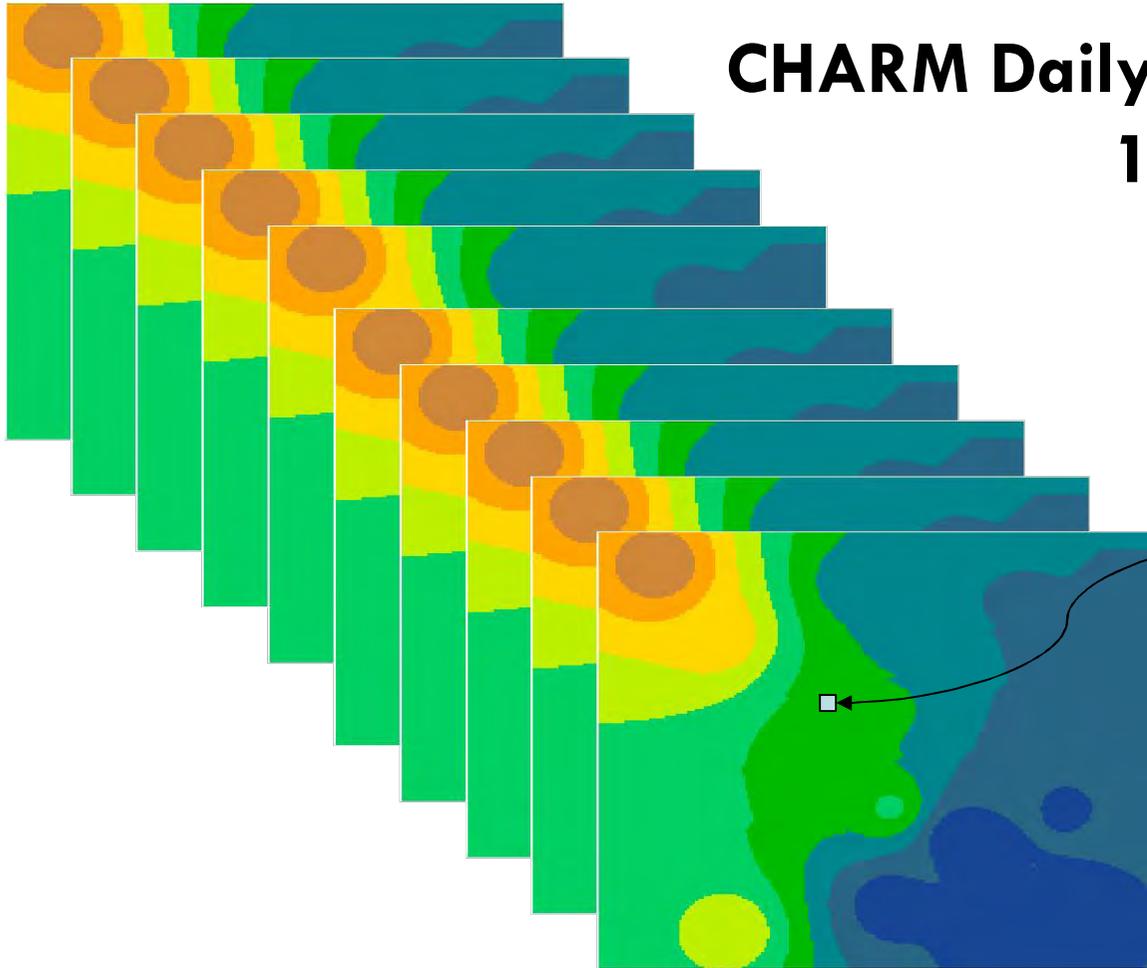


**Strong La Nina signal (High Confidence)**

# FEWS NET Forecast Interpretation Tool (FIT)

**CHARM Daily Rainfall Times Series,  
1961-1996**

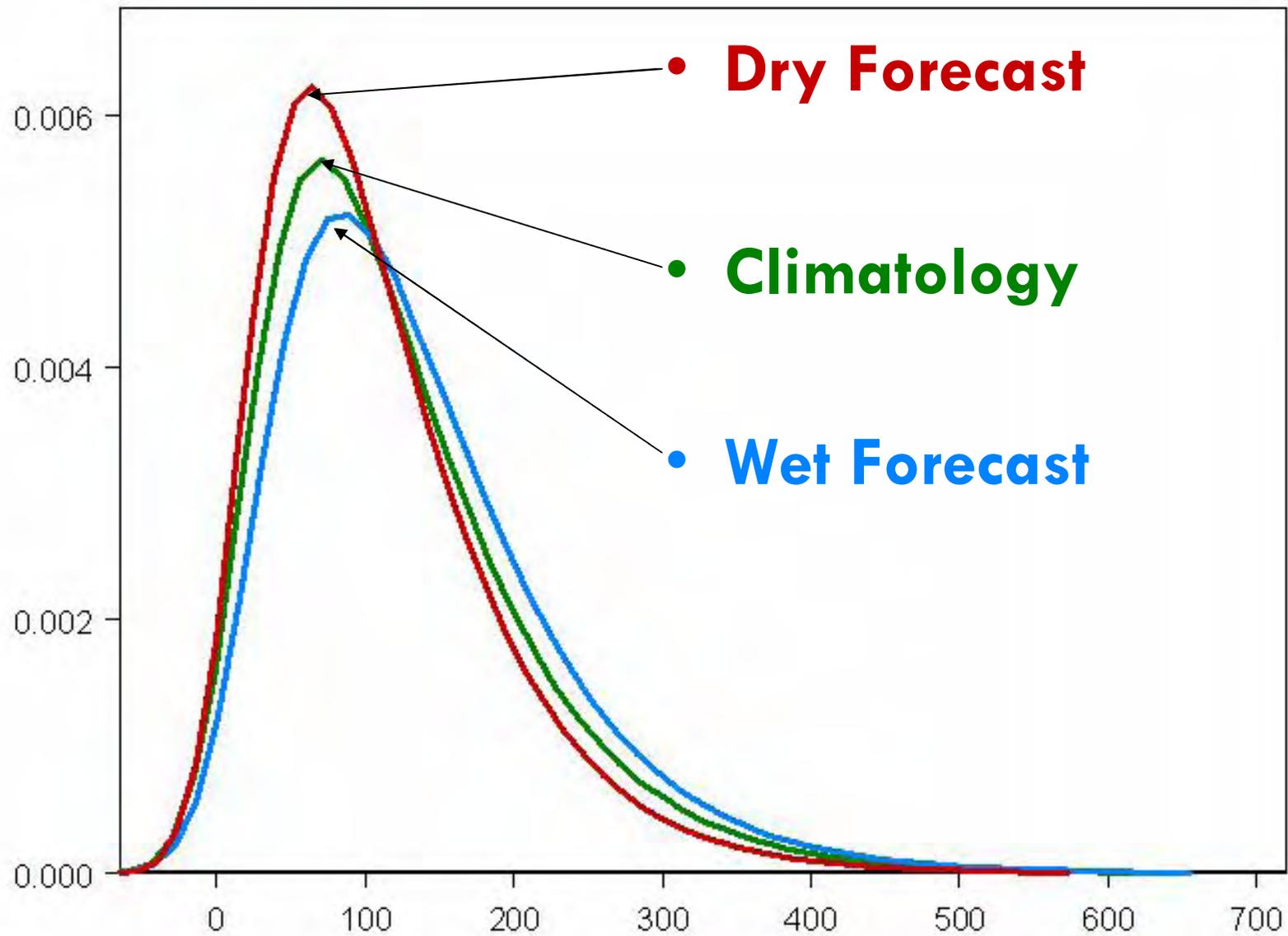
**Compute MAM sums**



**Fit Gamma Distributions  
Pixel-by-Pixel**

$$G(x) = \int_0^x g(x) dx = \frac{1}{\beta^\alpha \Gamma(\alpha)} \int_0^x x^{\alpha-1} e^{-x/\beta} dx$$

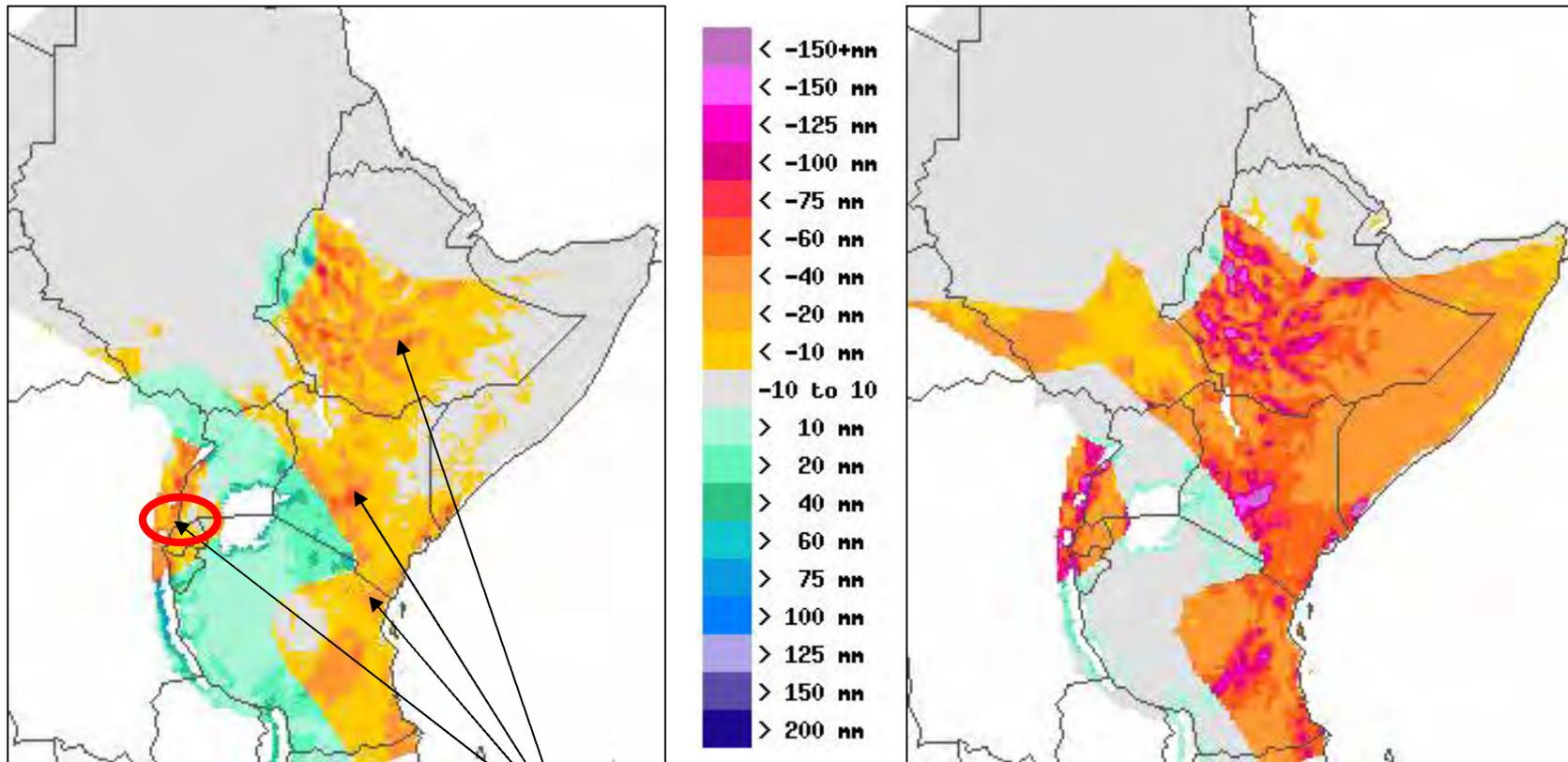
# FIT - Shift Distributions per Forecast



# Rainfall Anomaly Scenarios: March-May Season (From FEWS NET Forecast Interpretation Tool)

Forecast vs. Climatological 50<sup>th</sup> percentile

Forecast vs. Climatological 90<sup>th</sup> percentile

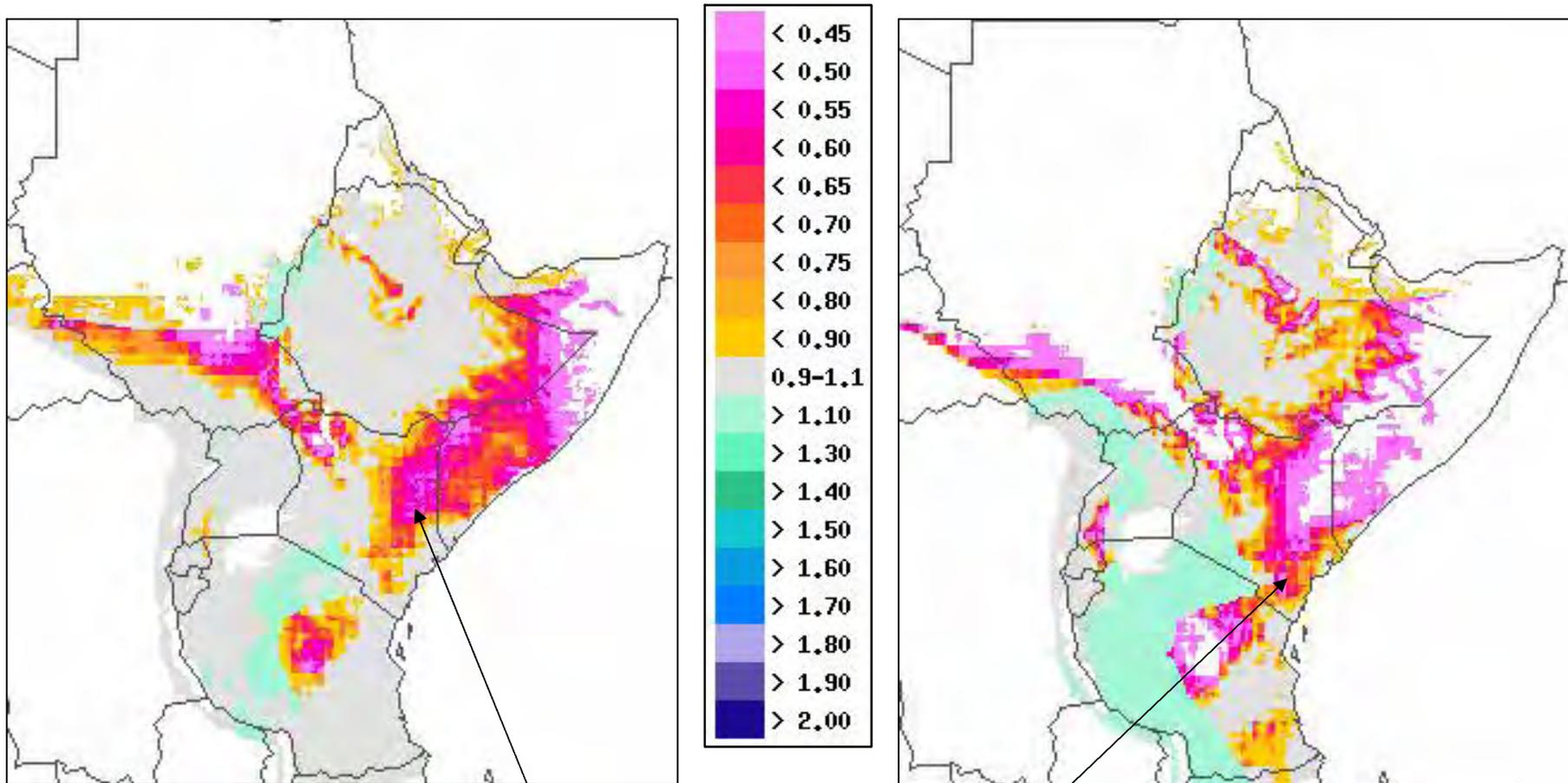


**Areas of Concern, that will require close monitoring**

# Threshold Probabilities (Long-Rains'08) (Forecast vs. Climatology)

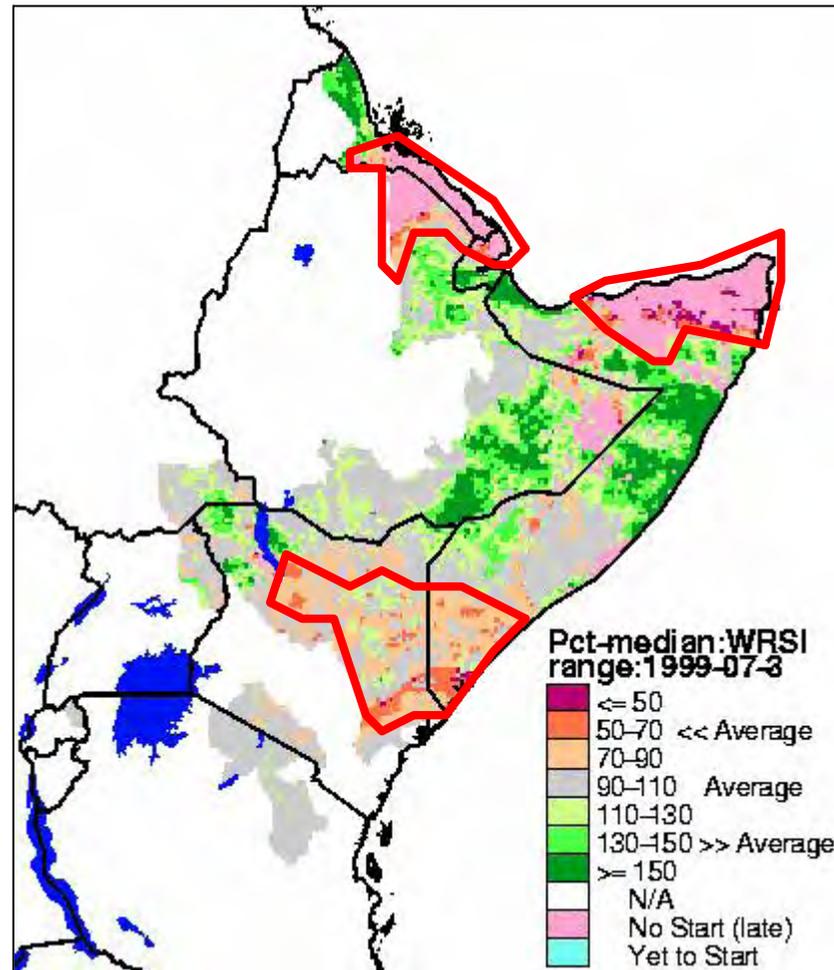
> 200mm

> 300mm



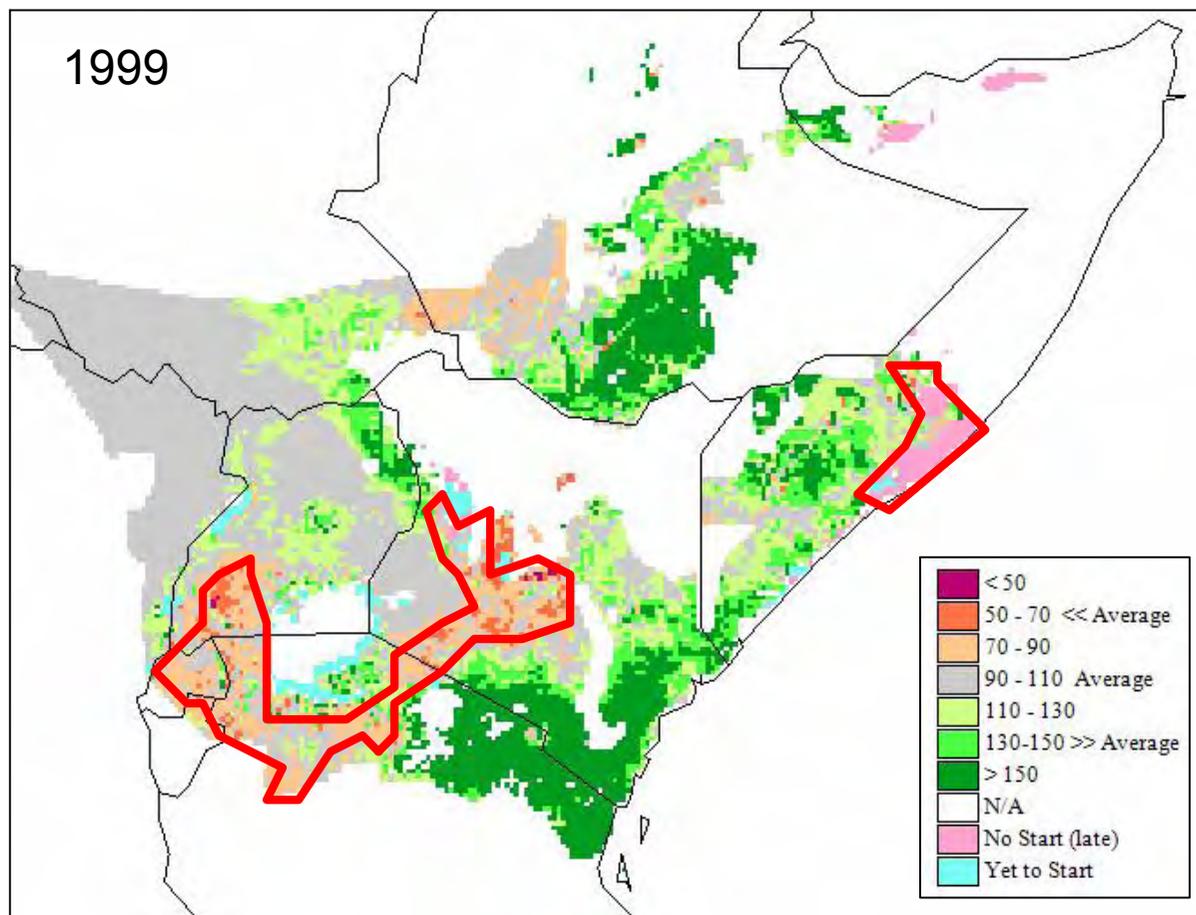
Food insecure pastoral & agro-pastoral areas of continuing concern

# Rangeland Anomalies: Analog year 1999



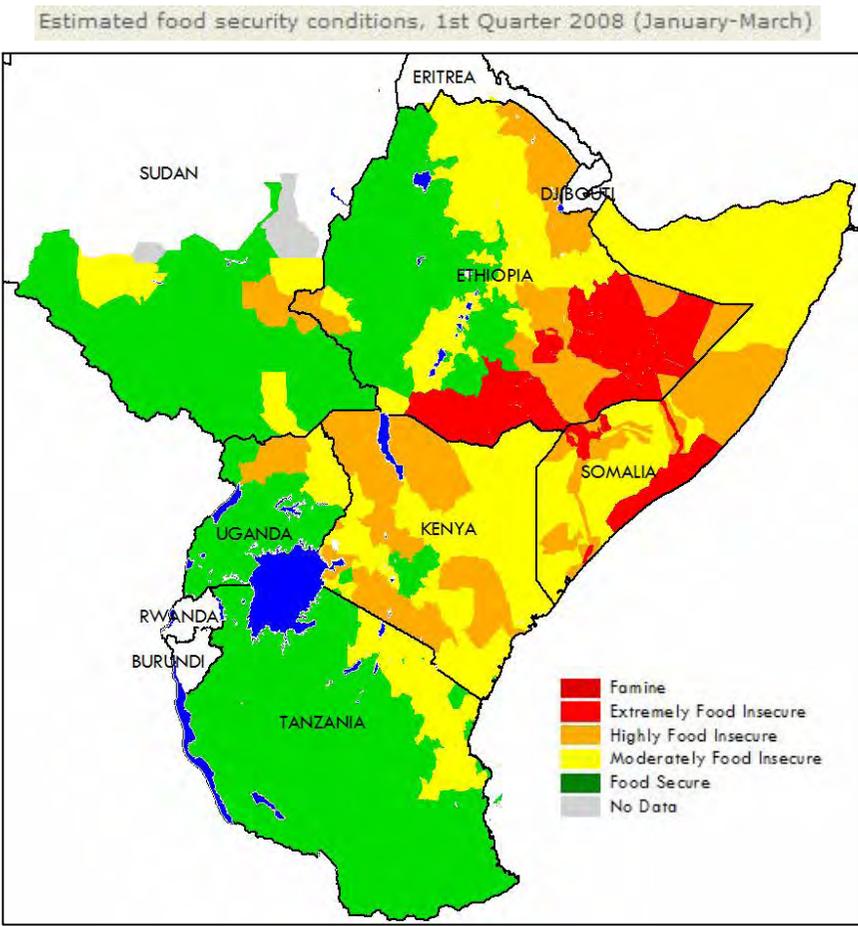
**Pastoral Areas of concern that will require close monitoring during 2008 long-rains**

# Crop Performance Anomalies: Analog year 1999

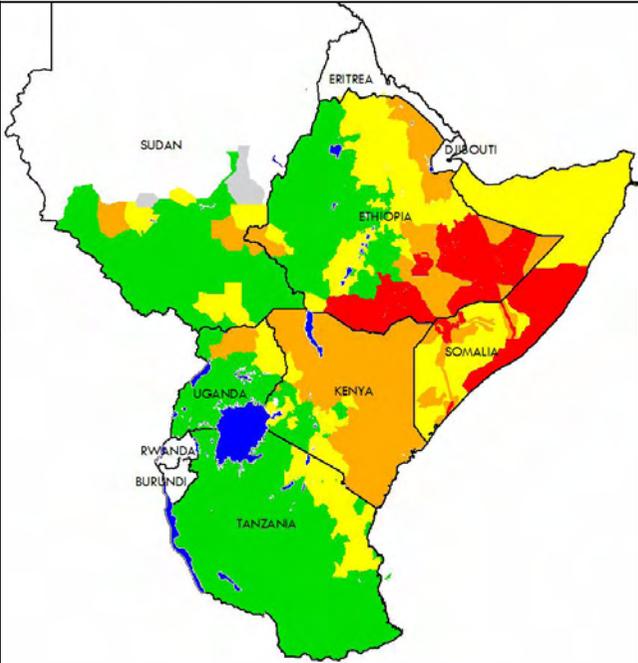


 Areas of concern

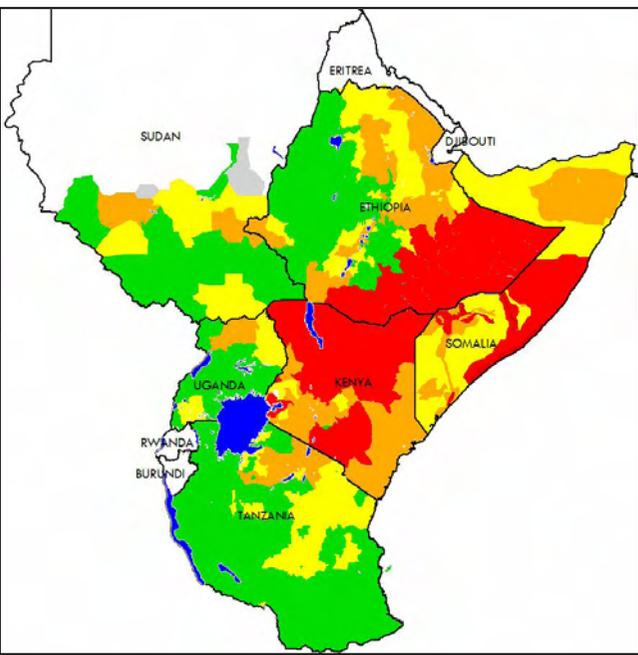
# GHA Food Security: Current Status and Outlook Scenarios



Most-likely



Worst-Case

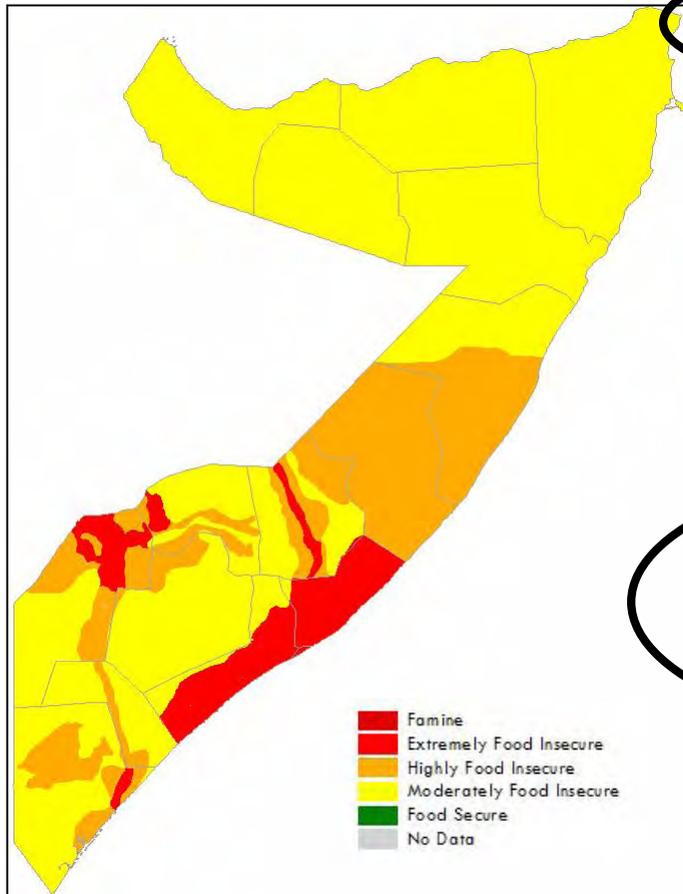


(GHA FEWS NET Report for Feb 2008)

# SOMALIA

## Food Security Status and Outlook (Considering CLIMATIC and NON-CLIMATIC factors)

Figure 1: Estimated food security conditions – First Quarter 2008



### Somalia: Figure 1: Current Main Food Security Issues

- Past poor rains in parts;
- Conflict and insecurity
- Poor Market supply and hyper-inflation;
- Nearly 1 million internally displaced people;
- Existing poverty and chronic food insecurity

### Figure 2: Most Likely Scenario: March-July 2008

- Below normal to near normal MAM rains
- Below normal *gu*-season crop and livestock production in southern Somalia;
- Continued conflict and insecurity in south-central regions;
- Displaced groups remain or increase
- Market disruptions and inflation remain;
- livestock demand and prices below normal;
- Deterioration or non-improving FS situation - Needy population to remain at about 2 million or could increase.

### Figure 3: Worst-Case Scenario: March – July 2008

- Poor MAM rainfall performance in most parts of the country
- Poor crop performance in south-central Somalia and deteriorating livestock conditions and production
- Market disruptions/failure, hyper-inflation, worsened
- More frequent conflict and increasing insecurity causing more displacement
- Increase in needy population likely to increase significantly

Figure 2: Most-likely Scenario Food Security Status: Mar. - July'08

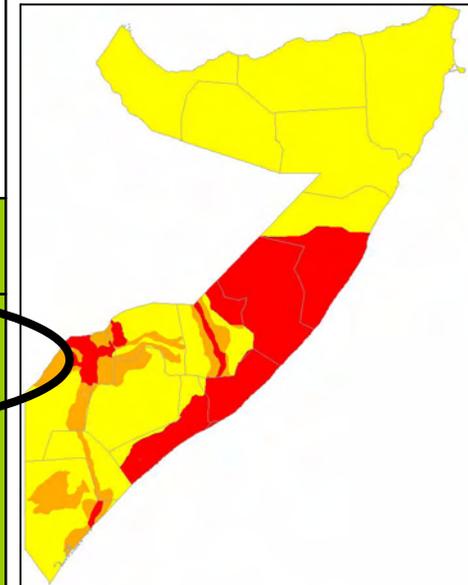
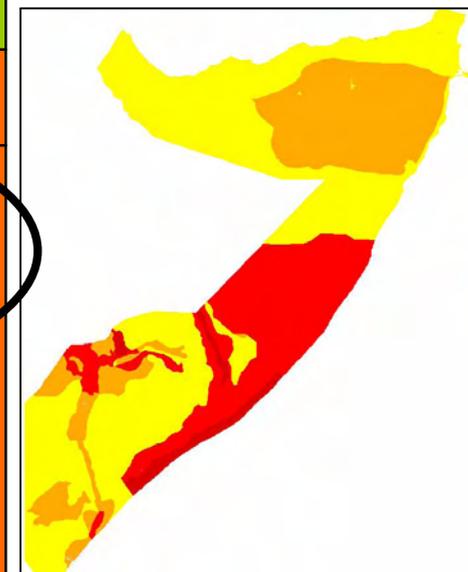


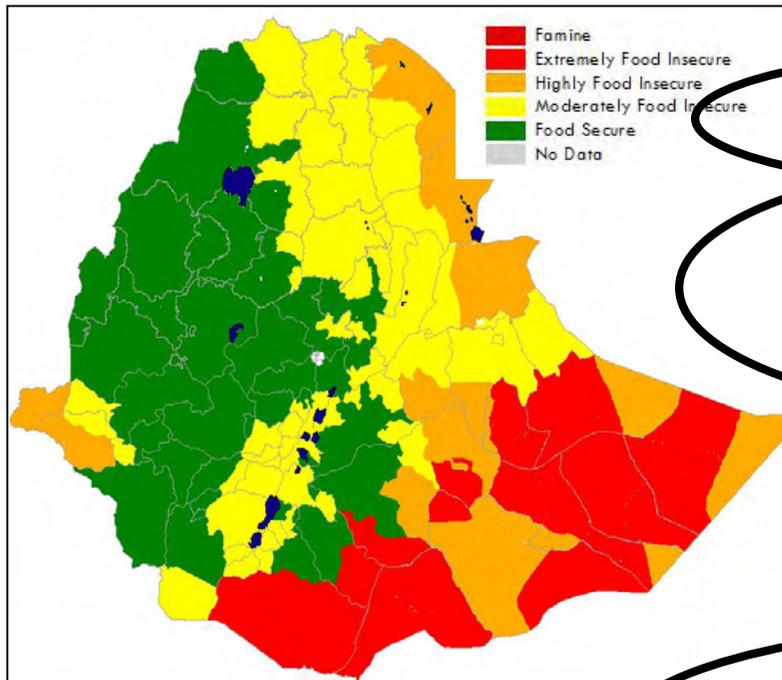
Figure 3: Worst-Case Scenario Food Security Status: Mar. - July'08



# ETHIOPIA

## Food Security Status and Outlook (Considering CLIMATIC and NON-CLIMATIC factors)

Estimated food security conditions, 1<sup>st</sup> Quarter 2008



### Ethiopia

#### Figure 1: Current Main Food Security Issues

- Poor 2007 rains and insecurity caused extreme food insecurity in parts of Somali region and Borena zone;
- Over 1 million requiring emergency assistance;
- About 8 million chronically food insecure being supported;
- Crop production above average in 2007

#### Figure 2: Most Likely Scenario: March-July 2008

- MAM rains expected to be below normal/erratic in eastern and southern parts;
- Marginal and short-lived improvements in livestock and crop production in southeast and southern lowlands;
- Belg crop likely below normal;
- Cereal prices will remain high or rise

#### Figure 3: Worst-Case Scenario: March – July 2008

- Failure of MAM rains;
- Belg crop failure affecting north-central more;
- Pastoral areas in south/southeast face serious drought

Fig. 2: Most-likely Scenario  
Food Security Status: Mar. - July'08

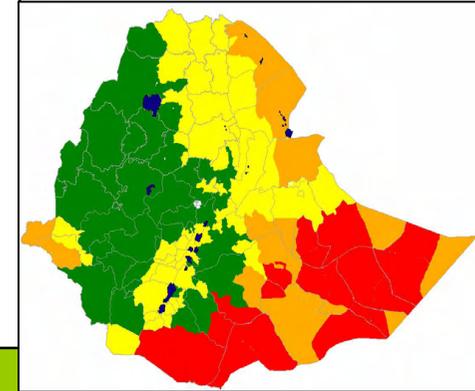
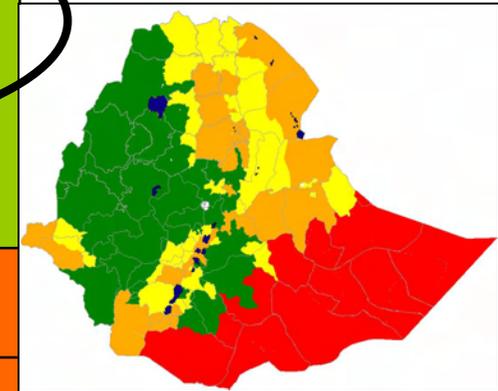


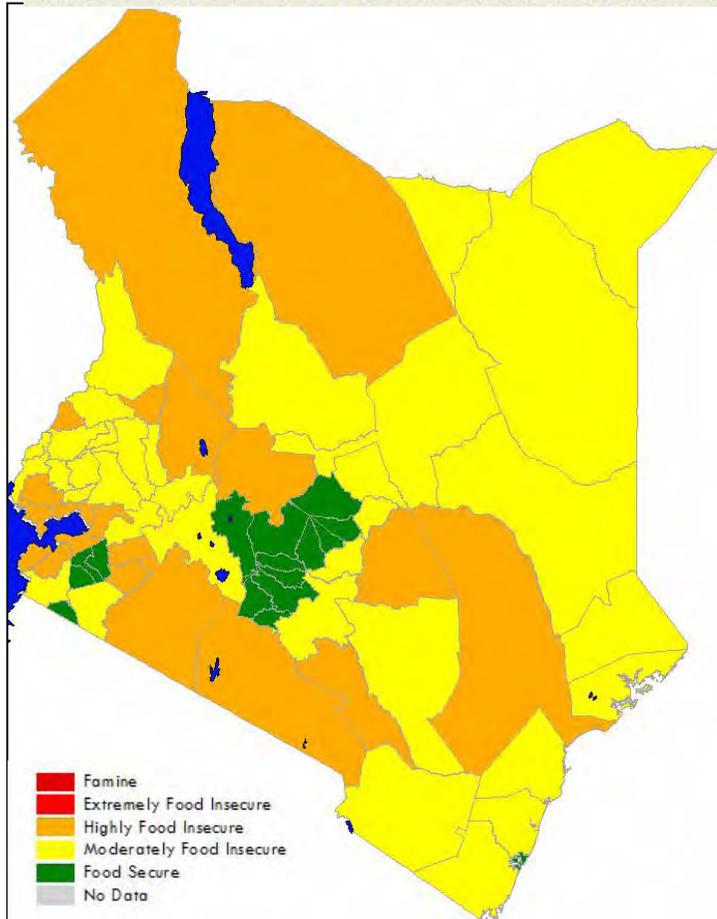
Fig. 3: Worst-Case Scenario  
Food Security Status: Mar. - July'08



# KENYA

## Food Security Status and Outlook (Considering CLIMATIC and NON-CLIMATIC factors)

Estimated food security conditions, 1st Quarter 2008 (January-March)



### Fig. 1 Current food security situation

- Post-election civil insecurity
- More than 300,000 IDPs
- Disruption and displacement of from the breadbasket areas
- High post harvest losses
- Market disruption & High food prices
- Economic slow-down
- Breakdown of physical assets

### Fig. 2 Most-likely Scenario

- MAM rains expected to be normal to below normal
- Lag in implementation of political solution

### Fig. 3. Worst-case Scenario

- Total failure of MAM rains
- Collapse of mediation process
- Pastoral areas face serious drought

Fig.2 Most-likely Scenario  
Food Security Status: Mar. - July'08

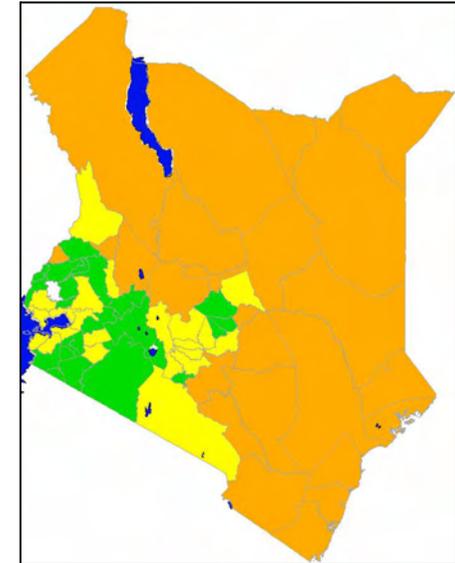
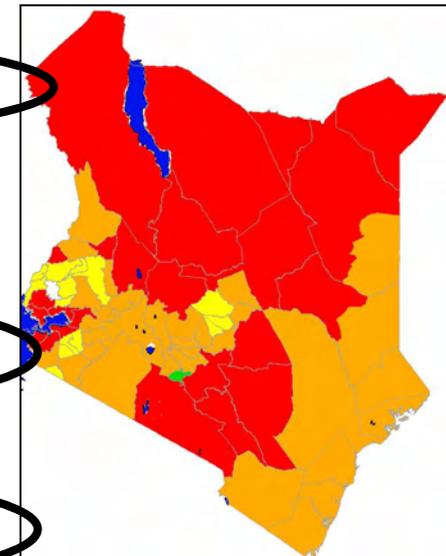


Fig. 3 Worst-Case Scenario  
Food Security Status: Mar. - July'08



## **Seasonal climate forecasts, when integrated with:**

- **Livelihoods baseline data and food security timelines**
- **Monitoring assessments of recent harvests and rangeland conditions**
- **Current status of markets and trade**

**- expressed as millimeter totals and anomalies, with associated probabilities of occurrence -**

**can provide the basis for expected agropastoral outcomes, and**

**Contribute significantly to Food Security Outlooks**

**Successful integration of seasonal climate forecasts  
into Food Security Outlooks depends in large  
measure on the efforts of intermediaries who are  
equally at ease with issues of food security and  
climate monitoring/forecasting.**

**In the GHA, the FEWS NET Regional Scientist, Gideon Galu, and his colleagues (ICPAC, FAO, etc) are very much engaged in playing this role.**

# Questions?

