

## Climate hazard forecasting and monitoring for improved Disaster Risk Reduction in Kenya

### Main hazards monitored in Kenya



Drought

Flood

Conflict

### Possible source of information



The Index for Risk Management (INFORM) is a global, **open-source risk assessment for humanitarian crisis and disasters**. It is designed to **support decision-makers in areas of prevention, preparedness and response**. INFORM is a collaboration of the Inter-Agency Standing Committee Reference Group<sup>1</sup> on Risk, Early Warning and Preparedness and the European Commission (INFORM, 2018). The information from **INFORM is also linked to the ALERT platform**.

#### Key Features:

- A downloadable annual global risk index (to understand and measure the risk of humanitarian crises and disasters)
- Country profiles detailing a country's general risk profile, looking at hazard, vulnerability and coping capacity trends

INFORMs Website: <http://www.inform-index.org/>

### Forecast and Monitoring Information

Forecast and monitoring information can help access information on:

- **Indicated precipitation** (below or above average rainfall),
- **Predicted onset and culmination of rains**,
- **Temperature and soil moisture**.

Users often access these indicators on a **sub-national level** or for monitoring **impacts on a specific sector**.

### Sources of information for forecast and monitoring information



#### Kenya Meteorological Department

Kenya Meteorological Department (KMD) is the **main national agency that provides climate information** and services (Kenya Meteorological Department, 2015). They have **local branches** in all counties in Kenya. At the local level, seasonal, monthly and weekly forecasts are downscaled. This enables decision-makers to access localised climate information for preparedness and early action (Development Initiatives, 2017).

#### KMD Early Warning information includes:

- Seasonal Forecasts
- Monthly forecasts
- Weekly forecasts
- Daily forecasts
- Agrometeorological bulletins (*Predicting how the weather is likely to affect crops/pasture*)
- Severe weather alerts and advisories

<http://www.meteo.go.ke/index.php?q=home>

<sup>1</sup> Partners include: acaps, European Commission, FAO, GFDRR, IDMC, the Red Cross Red Crescent, IOM, UNOCHA, OECD, START network, DfiD, UNDP, UNDPA, UNEP, UNFPA, UNHCR, UNICEF, UNISDR, UNU-EHS, UNWomen, USAid, WFP and WHO.

## How do organisations in Kenya use the information from the KMD?

- **Seasonal, monthly and 7-10 days forecasts:** prepare for the coming seasons and to monitor and estimate impacts of events.  
**Actions associated:** design or review of preparedness plans, application for early funding and dissemination of information to partner organizations or communities.
- **7-10 day & 1-5 day forecasts:** Monitor impacts and estimate magnitudes, especially for flooding scenarios.  
**Actions associated:** Prepare to respond.



### National Drought Management Authority

The National Drought Management Authority (NDMA) **coordinates all matters related to drought** management. Additional to NDMA's national office there are **23 branches in counties particularly vulnerable to drought** (NDMAa, 2017).



The Famine Early Warning Systems Network (FEWS NET) provides **objective, evidence-based early warning and analysis**. It is designed to **help agencies plan for and respond to humanitarian crises** on a global, regional or country level.

### (NDMA) Early Warning Bulletin:

- Provide county specific information from the previous month
- Contain climate data (e.g. Standardized Precipitation Index and Vegetation Cover Index)
- Contain socio-economic impact indicators (e.g. Livestock body condition, cattle price or nutrition status)

<http://www.ndma.go.ke/index.php>

### (FEWS NET) Food Security Outlook:

- 6-month scenario outlook based on rainfall, harvest prospects, labour demands, livestock health, import levels, migration, crop diseases, market functions and conflict indicators (FEWS NET, 2017)

Published every 6 months

### Monthly reports and maps

- Details on current and projected food insecurity

**Alerts** on emerging or anticipated crises

### Specialised reports on:

- Weather and climate;
- Markets and trade;
- Agricultural production;
- Livelihoods;
- Nutrition and food assistance

## How do organisations in Kenya use the information from the NDMA and FEWSNET?

This information is complementary to KMDs climatic forecasts and contain **socio-economic impact indicators**. FEWSNet uses the 'Integrated Phase Classification' (IPC) system, widely recognized by the international community as a measure of food security emergencies, enabling NGOs to compare and analyse data between cases and over time.

### Traditional Knowledge

Many users perceive that **scientific forecasts often clash with traditional forecasting** knowledge. This risks resulting in end-users not trusting forecasted information. However, actors are working to **find a common ground between traditional knowledge and forecast information**. KMDs and NDMA's **increased county-level presence is an opportunity** to find a common ground between scientific and traditional ways of forecasting. This would ultimately **increase the sense of ownership and trust of forecast information** amongst end-users.

## Cycle in the use of forecast information in Kenya

### Seasonal forecasts:

Used for drought and conflict by:

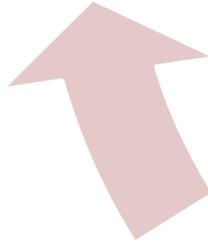
- Updating hazard monitoring indicators
- **Internal Minimum Preparedness Actions (MPAs)** such as: scenario planning, designing/reviewing scenario contingency plans, redesigning/updating ongoing development programmes and prepare funding applications or apply for funding
- **External Minimum Preparedness Plans** such as: disseminate information to partners and communities, recommend local governments to allocate funds for preparedness



### Monthly forecasts:

Used for drought, flooding and conflict by:

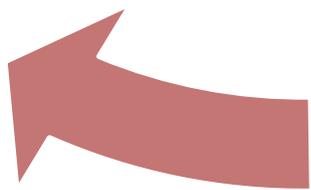
- Monitoring hazard indicators to track changes
- **Internal MPAs** such as: review/update scenario plans, update scenario contingency plans, apply for preparedness funding or re-allocate funds from other programmes and estimating potential impacts
- **External MPAs** such as: Disseminating information to local partners and communities, recommend local governments to allocate funds for preparedness
- Implement early response actions



### Daily - hourly forecasts:

Used for flooding and conflict by:

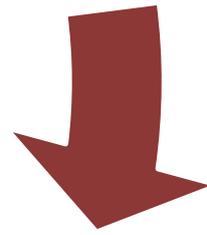
- Monitoring expected hazard magnitude to anticipate impacts
- Activating APAs
- Implementing response actions



### 5-10 Day forecasts:

Used for flooding and conflict by:

- Monitoring hazard indicators to track changes
- **Internal Advanced Preparedness Actions (APAs)** such as: activating response plans and apply for funds
- **External APAs** such as: clearing drainage or fixing water catchment to avoid flooding, alerting communities to get prepared
- Implementing early response actions



## Best Practices

There are many potential opportunities with linking forecasts to humanitarian preparedness actions, for both short and long-term forecasts. One benefit of acting in advance is the opportunity to avoid negative impacts of different hazard events.

Below are two examples of best-practiced forecast-based action in Kenya:

### **Avoiding anticipated conflict using seasonal forecasts.**

After receiving a seasonal forecast that indicated a lack of rain was likely to result in a drought, an INGO decided to disseminate the information to communities identified at risk of conflict due to lack of grazing lands. By sharing the information of the anticipated drought, the community leaders decided to get together and plan which areas that could be used for grazing at what time. Thereafter, specific grazing slots were assigned for people in the community and other slots were assigned for migrating pastoralists. This planning helped the community manage their grazing land better. This led to all parties knowing where they could let their livestock graze when the drought impacts occurred (INGO#1, 2018). Although it is impossible to claim that a conflict was certain to break out without the assigned grazing slots, this example illustrates how planning based on forecast information could be a low-cost example of how to better manage drought and avoid conflict.

### **Using short-term forecasts to avoid an outbreak of waterborne diseases during anticipated flooding.**

Having developed contingency plans for different hazard scenarios, one INGO decided to act based on a short-term forecast that indicated increased rainfall was likely to result in flash flooding. The action triggered involved handing out sanitation kits and distributing fog-machines in one of Kenya's refugee camps. The goal was to reduce expected negative flood impacts, such as the outbreak of waterborne diseases (e.g. cholera), and malaria (INGO#4, 2018). Despite this action not being triggered automatically by the forecasts, this example illustrates how INGOs currently use forecast information on a case-to-case basis to update their contingency plans and implement actions for different scenarios.