REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT AND MINERAL RESOURCES

KENYA METEOROLOGICAL DEPARTMENT

Dagoretti Corner, Ngong Rd, P. O. Box 30259, 00100 GPO, Nairobi, Kenya
Telephone: 254 (0) 20 3867880-7 / 3876957/60 / 3873682
Mobile: 254(0)724255153/ 254(0)724255154
Fax: 254 (0) 20 3876955/3877373/3867888/3874501
e-mail: director@meteo.go.ke; **Website**: http://www.meteo.go.ke

REVIEW OF THE WEATHER IN SEPTEMBER AND THE OUTLOOK FOR OCTOBER 2011

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1. SUMMARY

1.1 Weather Review in September 2011

- *Climatologically, Kenya is characterized by generally sunny and dry weather conditions over vast areas during the month of September. The same scenario was therefore replicated over the country in September 2011, with the exception of the western region where highly enhanced rainfall was recorded as predicted. In this region, a historic daily rainfall amount of 116.6mm was recorded at Lodwar Meteorological station on 2nd September 2011. The amount, which resulted into severe flash floods, is the highest ever recorded at the station in a single day for the past 89 years.*

1.2 The forecast for October 2011

The outlook for October 2011 indicates that:

- *Most parts of Western, Northwestern, Central and the Coastal strip are likely to experience enhanced rainfall during the month.*
- *Depressed rainfall is expected elsewhere in the country.*
- *The expected weather conditions during the month are likely to be driven by warmer than average Sea Surface Temperatures (SSTs) over the Equatorial western Indian Ocean adjacent to the East African Coast.*

2.1 WEATHER REVIEW FOR SEPTEMBER 2011

The rainfall experienced in the western region occasionally spread to the central Highlands and Nairobi area. Embu Meteorological station, for example, recorded 56.7mm on 23rd September.

Kisii Meteorological station recorded the highest monthly rainfall total of 204.7mm (126%) as compared to its September Long-Term Mean (LTM) of 161.8mm. Kericho, Nakuru, Kitale, Eldoret Kapsoya, Lodwar, Nyahururu, Kakamega and Embu Meteorological stations recorded 188.7mm (109%), 143.4mm (185%), 141.1mm (151%), 140.3mm (230%), 135.2mm (3976%), 128.2mm (195%), 124.5mm (75%), and 100.6mm (288%) respectively. Eldoret Airport, Kisumu, Narok, Laikipia Airbase, Mtwapa and Mombasa Meteorological stations recorded amounts of between 50 and 100mm while elsewhere in the country any station that experienced rainfall recorded amounts less than 50mm with Marsabit and Mandera stations recording nil rainfall for the entire month as depicted in **Figure 1**.

2.2 REVIEW OF THE SYNOPTIC PATTERNS IN SEPTEMBER 2011

During the month of September 2011, warmer than average Sea Surface Temperatures (SSTs) continued to occur over western Equatorial Indian Ocean adjacent to the coast of East Africa. However, SST anomalies in the eastern and central equatorial Pacific Ocean (Niño areas) have increasingly become negative, an indication that La Nina conditions are resuming. Atmospheric circulation anomalies are also consistent with La Niña.

The Meridional (North-south) arm of the Inter-Tropical Convergence Zone (ITCZ) was well over the western parts of the country occasionally extending to central Highlands and Nairobi area. The Zonal (east-west) arm of the ITCZ remained further north in Ethiopia. The Eastern Africa high-pressure ridge was moderately strong while the Arabian ridge had not established by the end of the month.

3. EXPERIENCED IMPACTS

- The prolonged dry conditions over Northeastern and Southeastern lowlands of the country continued to affect most livelihoods of communities with lack of food and water aggravating the situation. This was more so in the marginal areas where people had to cover long distances in search of water, both for human and livestock consumption.
- Livestock continued to die in the pastoral areas due to lack of pastures and water
- On the other hand, the heavy rainfall that occurred in Western Kenya caused serious flooding that led to loss of human life and destruction of property. The rainfall also affected harvesting activities in some areas.

4. CLIMATE OUTLOOK FOR OCTOBER 2011

This climate outlook is based on models developed from expected evolution of global SSTs and SST gradients**.** The warmer than average SSTs over the Equatorial western Indian Ocean adjacent to the East African Coast were also considered. The expected onsets and the distribution of rainfall were derived from statistical analysis of past years (analogue years), which exhibited similar characteristics to the year 2011.

Based on the foregoing methodology, the derived forecast indicates that most parts of western, northwestern, central highlands including Nairobi and the coastal region are likely to experience near-normal to above normal (enhanced) rainfall during the month of October. The rest of the country is likely to experience slightly depressed rainfall **(See figure 2)**. The specific outlook for individual areas is as follows:

The Highlands West of the Rift Valley (Kitale, Kericho, Nandi, Eldoret, Kakamega etc), Lake Basin (Kisumu, Kisii, Busia etc), central Rift Valley (Nakuru, Narok, Nyahururu, Naivasha etc), Highlands East of the Rift Valley (Nyeri, Muranga, Kiambu, Embu, Meru etc), Nairobi (Dagoretti, Wilson, Eastleigh etc), Northwestern Kenya (Lodwar, Lokichoggio, Lokitaung etc), the Coastal strip (Mombasa, Mtwapa, Malindi, Msabaha, Lamu etc) and some parts of south eastern lowlands (Voi, Taveta, Taveta etc) are likely to receive near normal rainfall with a tendency to above normal (enhanced) rainfall.

Most parts of northeastern Kenya (Moyale, Marsabit, Mandera, Wajir, Garissa etc) and Southeastern lowlands (Machakos, Makindu, Kitui, Tana River etc) are likely to receive near normal rainfall with a tendency to below normal (slightly depressed) rainfall.

5. EXPECTED ONSET DATES

The onset of the October-December 2011 seasonal rains is expected during this month of October as hereby detailed.

- **Nyanza and Western Counties**: represented by Kakamega, Busia, Kitale, Eldoret, Kisii, Kericho, Kisumu, Nyamira, Gucha, Kuria, etc are expected to continue experiencing rainfall during the first week of October spreading from the month of September.

- **North Rift, Central Rift and the Extreme Northern parts of Eastern and Northeastern Counties**: The onset in the Northwestern parts of the country (Lodwar, Lokitaung,

Lokkichogio etc); **northern parts of Central Rift Valley** (Nakuru, Nyahururu etc) and **extreme northern areas** (Moyale, Mandera, Sololo etc) is expected during the first to second week of October.

- **Central Counties, Counties in central and southern parts of Eastern and Northeastern Kenya, South Rift and parts of Coast Province**: **Central Highlands** (Meru, Embu, Nyeri, Murang'a, Nanyuki etc); **Nairobi area** (Dagoretti, Kabete, Eastleigh etc); Northeastern (Wajir, Garissa, Marsabit etc); **The southeastern lowlands** (Voi, Taita, Taveta, Makindu, Tana River); **southern parts of central Rift Valley** (Narok, Kajiado etc) will experience their onsets in the third to fourth week of October.

- **Coastal Strip:** Onset over the southern Coastal strip (Malindi, Mombasa, Kilifi, Mtwapa Msambweni, Lungalunga, etc) is expected during the first to second week of October. The northern Coastal strip (Lamu etc) will experience the onset during the fourth week of October to 1st week of November **(see figure 3).**

6. POTENTIAL IMPACTS ON VARIOUS ECONOMIC SECTORS

6.1 Water Resources Management and the Energy Sectors

- The onset of the short rains in October will trigger the rise of water levels in reservoirs across the country, including the Tana and Turkwel river systems which provide water for cities and hydropower generation. Communities, especially in arid and semi-arid counties, are advised to put in place structures for **harvesting the rain-water** for future use.

- In order to reduce the **soil erosion potential** associated with heavy rainfall, farmers are advised to implement soil erosion controls such as terracing, tree planting, planting of grass (e.g. nappier) and clearing of drainage trenches to divert storm runoff.

- **High flood potential** indicated by heavy rainfall and high water levels, has persisted since August 2011 in parts of Western Kenya, including Budalang'i (Nzoia) and Kano (Nyando) plains. It is expected that the flood risk will remain high during October 2011, as heavy rains are likely to pound the Nzoia and Nyando catchments. In view of this, the Budalang'i and Kano plains communities are advised to ensure the **integrity of the dykes**, to **clear any vegetation** in the channel between the dykes and be ready to **evacuate** in case the dykes breach.

6.2 Agriculture, food security and livestock development sectors

The rainfall expected over the coast and western Kenya necessitates farmers in these areas to liaise with the Ministry of Agriculture to make best use of the rains in planting appropriate crops. Pasture and water availability problems are likely to persist in the north eastern and southeastern parts of the country since the rains are likely to set in later in the month. The rainfall is also likely to affect harvesting in parts of the Rift Valley.

6.3 Disaster Management sector

- Episodic storms may cause flooding in areas which are prone to flooding. Further, the soils in some areas in western Kenya are already soaked and saturated such that additional high rainfall may lead to land/mud/mudslides, especially in areas with steep slopes and less vegetation, especially in Keiyo, Nandi, Mt Elgon and Kisii. Areas in Central Kenya like Murang'a have some likelihood of land/mudslides too. Occasional flooding in parts of the Coast; in lower Tana and Kwale may occur due to the expected enhanced rainfall in the region.

- Heavy storms accompanied by lightning are also expected in Western Kenya; especially Kericho, Kisii, Nandi and Kakamega The public is advised not to shelter under trees as these renders them vulnerable to the lightning strikes prevalent in Western Kenya. If

caught in a storm, one should run instead of walking. Further, when sheltering in a house or building, avoid being close to windows or doors and put on slippers.

6.4. Transport and Public Safety Sector

The expected enhanced rainfall is likely to lead to muddy and slippery conditions on the roads in parts of western, Nyanza, Rift Valley and central Kenya as well as well as the coastal region. This may result in vehicles getting stuck and stalling in the muddy sections. Accidents may also occur as vehicles veer suddenly due to slippery conditions on the roads. Motorists are, therefore, advised to drive carefully in order to avoid such accidents that may emanate from the poor road conditions. In areas expected to have above-normal rainfall (enhanced rainfall), swelling of streams will cause water to overflow over bridges that were constructed without use of data on return periods.

Foggy conditions are expected to occasionally occur on high ground areas of Limuru, Mt. Kenya region as well as Timboroa. The fog will affect visibility and hence motorists advised to drive carefully.

6.5. Coastal Impacts

- Increased sediment discharge at the Coast resulting from high sediment load from inland areas. Coastal ecosystems, such as salt marshes and mangroves, will improve due to high sediment discharge from inland areas.
- Increased waste deposit from inland regions.
- Increased freshwater input on coastal estuaries which results in less saline water. It will improve the water quality of surface and groundwater reservoirs along the coast.
- Rising water tables in surface and groundwater reservoirs.
- Increased rainfall events at the Coast may disrupt Port operations.

NOTE: ***This forecast should be used as guidance in planning and preparedness by decision-makers and the public and in various climate sensitive sectors. More detailed sector-specific and localized forecast may be obtained on request from the Kenya Meteorological Department Headquarters as well as the Provincial Meteorological Offices. The public is also advised to use the forecast in conjunction with the daily (24-hour), four-day and weekly forecasts issued by this Department***

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DR. JOSEPH R. MUKABANA
FOR DIRECTOR OF METEOROLOGICAL SERVICES

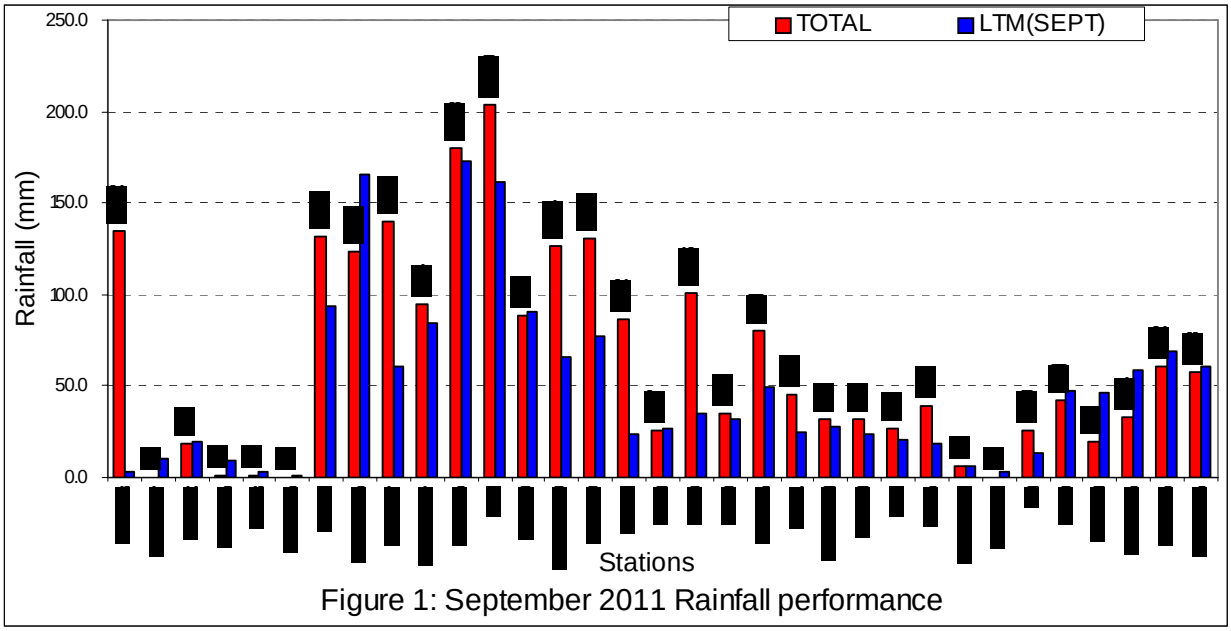

Figure 1: September 2011 Rainfall performance

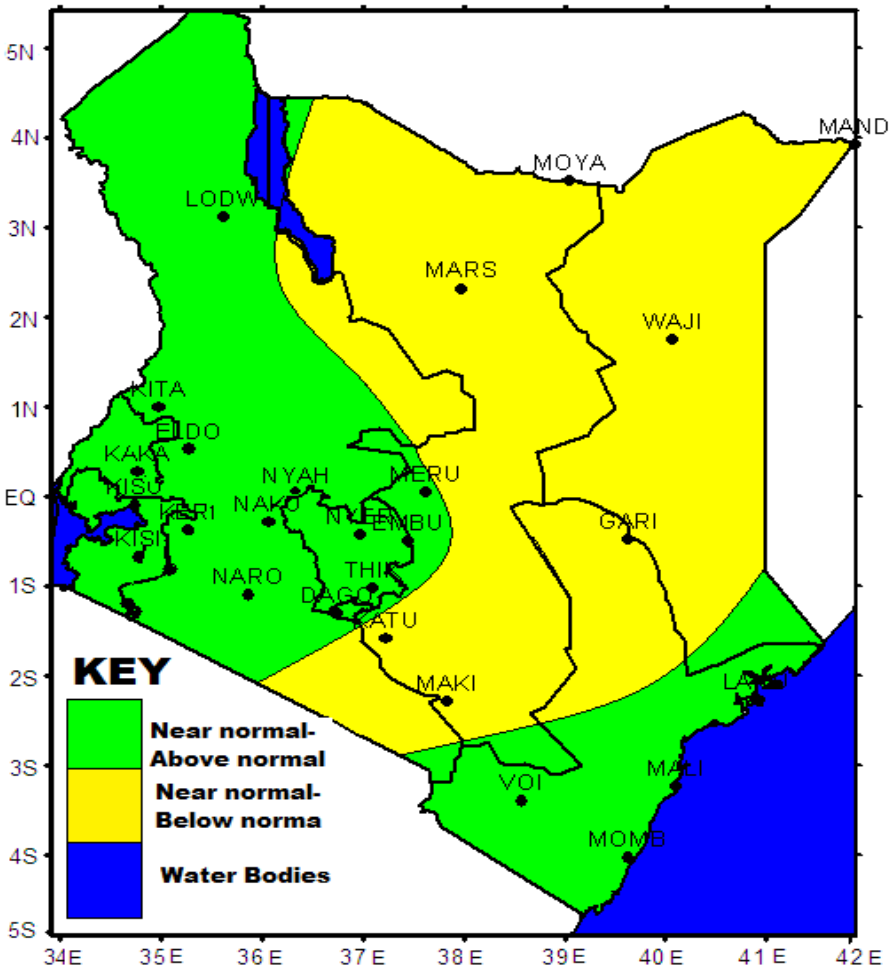

Figure 2: Rainfall Outlook for October 2011

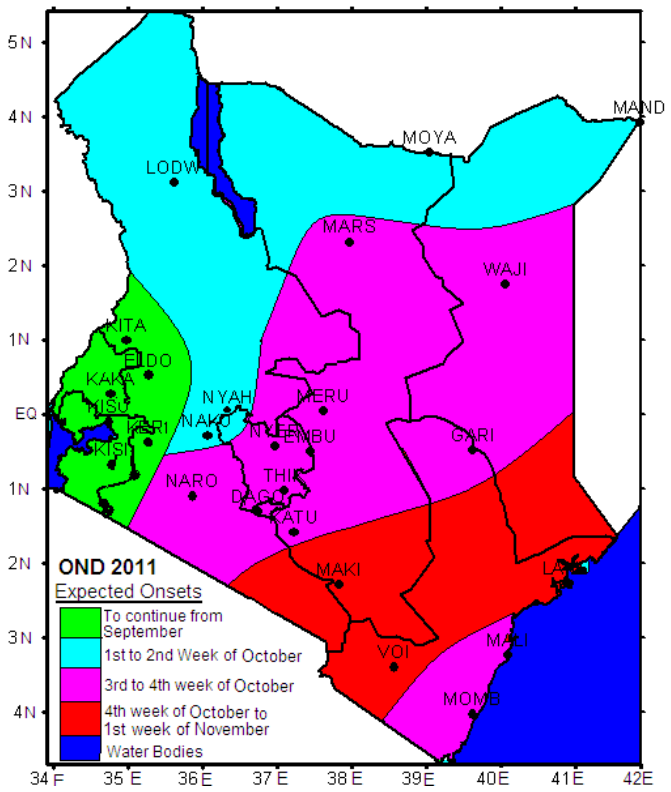

Figure 3: Expected Onset for October-December 2011 "Short-Rains" Seasonal Rainfall