



REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT AND MINERAL RESOURCES

KENYA METEOROLOGICAL DEPARTMENT

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REVIEW OF RAINFALL DURING THE “LONG RAINS” (MARCH TO MAY) 2010 SEASON AND THE OUTLOOK FOR THE JUNE-JULY-AUGUST (JJA) 2010 PERIOD

1. SUMMARY

Rainfall Review in March - May 2010

- *Most parts of the country recorded enhanced rainfall that was well distributed both in time and space. This was more so over the Northwestern, Western, Central and Northeastern parts of the country where most Meteorological Stations recorded rainfall that was well above 100 percent of their seasonal Long-Term Means (LTMs) for March to May.*
- *The heavy and continuous rainfall had both positive and negative impacts as follows:*
 - ✓ ***POSITIVE:*** *Many rainfall dependent sectors including agriculture, water resources, livestock and energy among others benefitted well.*
 - ✓ ***NEGATIVE:*** *Floods and landslides/mudslides occurred in different parts of the country and claimed about 100 human lives, washed away animals and livestock, destroyed property worth millions of shillings, and displaced many people.*

The forecast for June-July-August 2010

- *In June to August (JJA) season, rainfall is normally concentrated over the western and coastal parts of the country.*
- *The outlook for June-July-August 2010 period indicates that:*
 - ✓ *The Western highlands (Kericho, Kisumu, Kakamega, Kisii, Kitale, Eldoret) and Central Rift Valley (Narok, Nakuru, Nyahururu) are likely to receive near normal rainfall with a tendency to above normal (enhanced). This rainfall may occasionally spread eastwards to the central highlands and Nairobi area;*
 - ✓ *The coastal strip (Mombasa, Mtwapa, Matuga, Kwale, Malindi, Lamu etc) is expected to experience near normal with a tendency to slightly depressed rainfall;*
 - ✓ *The central highlands including Nairobi area will experience cool, cloudy and drizzly conditions.*
 - ✓ *Fairly low temperatures are also expected to be experienced in Central Rift Valley (Narok, Nakuru, Nyahururu, Timboroa) and parts of the highlands west of the Rift Valley (Kericho and Eldoret).*

2. REVIEW OF “LONG RAINS” (MARCH-MAY) 2010 SEASONAL RAINFALL

The “Long Rains” (March-April-May) 2010 rainfall season that commenced on time in March 2010 has ceased over most parts of the country. An assessment of the rainfall recorded from 1 March to 31 May 2010 (**Figure 1a-1d**) indicates that the rainfall performance was quite good over most parts of the country. The good performance was reflected both in the amounts

received and the distribution in time and space. The total rainfall amounts received over most of the country were well above 100% of the Long-Term Means (LTMs). Garissa and Nyahururu stations for example recorded 191% and 188% of their seasonal LTMs respectively. The northwestern, western, central and northeastern districts recorded the most enhanced rainfall. However, Marsabit Meteorological Station in northern Kenya recorded just 49% of its LTM and was the only Meteorological Station in the country that recorded highly depressed rainfall. Jomo Kenyatta International Airport recorded 77% of its LTM. Other stations that recorded rainfall below 100 percent of their respective Long Term Means (LTMs) were Narok in Central Rift Valley and Voi in the Southeastern lowlands.

The seasonal rainfall was characterized by short-lived heavy storms in some areas in all the three months. In each of the three months (March, April and May 2010), the intense rainfall storms resulting in heavy rainfall figures were observed in the following Meteorological Stations and dates:

In March 2010

- Makindu recorded 82.8mm on 6th March while Garissa had 86.1mm on 20th March; and
- Machakos, Thika, Wilson Airport and Moi Airbase stations realized 119.7mm, 86.2mm, 85.1mm and 81.2 mm respectively on 24th March

In April 2010

- while Msabaha station recorded 79.8 and 70.1mm on 13th and 14th April respectively;
- Lamu and Malindi respectively realized 236.4mm and 93.5mm on 14th April. The storm at Lamu was the heaviest in the season; and
- Meru station recorded 94.7mm on 29th April.

In May 2010

- Mtwapa, Lamu, Nyeri and Dagoretti Corner stations recorded 166.2mm, 124.9mm, 116.7mm and 86.3mm on 21st, 8th, 1st and 9th May respectively.

Kisii Meteorological station recorded the highest rainfall amount of 858.0mm for the season which was 126% of the LTM. Kericho, Dagoretti Corner, Mtwapa, Lamu, Kakamega, Kisumu, Msabaha, Malindi, Moi Airbase, Embu and Kitale stations followed with 789.3mm (117%), 762.9mm (156%), 758.4mm (125%), 732.6mm (156%), 714.0mm (105%), 710.4mm (131%), 670.2mm (126%), 657.4mm (124%), 645.1mm (104%), 643.1mm (114%) and 600.0mm (136%) respectively. The rest of the station recorded less than 600mm.

3. EXPERIENCED IMPACTS

The heavy rainfall performance experienced over most parts of the country impacted both positively and negatively on various sectors such as agriculture and livestock, disaster management, energy, water resources and health among others. These impacts included:

- Good crop performance in the southeastern lowlands, eastern highlands, central Rift Valley and western highlands;
- Good pasture conditions and adequate water availability in pastoral areas due to enhanced rainfall;
- Filling up to capacity of the Seven-Forks hydroelectric power generation dams due to enhanced rainfall in the catchment area of Tana River in the central highlands;
- Outbreak of water-borne diseases in some parts of the country;
- Loss of human and animal lives in different parts of the country as a result of raging rivers, floods and landslides/mudslides;
- Destruction of infrastructure due to floods. Several roads in the country have been

- rendered impassable; and
- Displacement of people in low lying areas.

4. FORECAST FOR JUNE-JULY-AUGUST 2010

Significant rainfall during the period June–July–August (JJA) is normally concentrated to the western and coastal parts of the country (**See Figure 2**). It is a very important season for plant growth and development in the North Rift parts of the country.

Much of the country is normally characterized by generally cool and dry conditions with some attendant impacts during the season.

4.1 Rainfall Outlook

The rainfall outlook for June to August 2010 is based on regression of sea surface temperatures (SSTs), Sea Surface Temperature (SST) gradients and the expected evolution of global SST patterns as well as upper air circulations patterns on Kenyan rainfall. The expected performance is also based on statistical analysis of past years, whose characteristics were found to be similar to this year.

The forecast for June to August 2010 indicates that the Western highlands, Lake Basin and central Rift Valley are likely to receive near-normal rainfall with a tendency towards above normal (enhanced rainfall), while the Coastal strip is expected to receive slightly depressed rainfall. The rest of the country is expected to remain generally dry (**Figure 3**). Most areas in the Central Highlands and Nairobi area are expected to experience cool and cloudy conditions with occasional drizzle or light rains. The specific outlooks for individual areas are as follows:

The Western Highlands (*Kitale, Kericho, Nandi, Eldoret, Kakamega, Bungoma, Butere/Mumias, Vihiga etc*); **Lake Basin** (*Kisumu, Nyando, Kisii, Busia*) and **Central Rift Valley** (*Nakuru, Narok, Kajado, Ol Kalaa, Nyahururu*) are likely to receive near-normal rainfall tending to above normal (enhanced) rainfall.

The Coastal strip (*Mombasa, Mtwapa, Msabaha Malindi, Lamu etc*) is likely to receive near-normal rainfall with a slight tendency to below normal (slightly depressed) rainfall.

The Central Highlands (*Kiambu, Nyeri, Embu, Meru, Murang'a*); **Nairobi Area** (*Dagoretti, Kabete, Wilson, Jomo Kenyatta International Airport, Eastleigh etc*); will experience cool and cloudy conditions with occasional light rains. Occasional prolonged hours of overcast skies (cloudy conditions) resulting to cold and chilly conditions are expected. The temperatures are expected to be slightly below average during the period.

Northwestern (*Lodwar, Lokichoggio, Lokitaung, North Horr*); **Southeastern lowlands** (*Machakos, Makindu, Kitui, Mwingi, Kibwezi, Voi, Taveta*) and **Northeastern Kenya** (*Wajir, Mandera, Garissa, Moyale, Marsabit, Isiolo, Garbatulla*) are expected to remain generally dry throughout the period. The southeastern regions bordering the central districts (Machakos area) will occasionally experience cool and cloudy conditions with occasional light rains.

4.2 Temperature Outlook

A drop in temperatures to relatively low values is expected over most parts of the country within the season. The central highlands including Nairobi area are likely to experience cool, cloudy and drizzly conditions. Fairly low temperatures are also expected to be experienced in

Central Rift Valley (Narok, Naivasha, Nakuru, Nyahururu, Timboroa among others) and parts of the highlands west of the Rift Valley (Kericho and Eldoret).

Persistent cloudy and overcast conditions are expected to result in chilly and cold days especially over **the central highlands** (Kiambu, Nyeri, Embu, Meru, Murang'a); and **Nairobi** (Dagoretti, Kabete, Wilson, Jomo Kenyatta International Airport, Eastleigh etc). Chilly and cold conditions are also likely to occur in some parts of **the central Rift Valley** (Nyahururu, Timboroa, Narok, Eldoret, Kericho etc.)

5. POTENTIAL IMPACTS EXPECTED

The following are the expected impacts during the coming season:

5.1 Agriculture and Food Security Sector

Good crop performance is expected in the western highlands, Lake Basin, Rift Valley, central highlands, parts of southeastern lowlands and the coastal strip following the well distributed rainfall in March-May rainfall season; Crop growth in Trans Nzoia and Uasin Gishu districts is expected to be enhanced by the anticipated near normal to enhanced rainfall in those areas.

5.2 Disaster Management Sector

Good pasture and adequate water availability is likely to be sustained for livestock in the Arid and Semi-Arid Lands (ASALs) as a result of the good rainfall during the "Long Rains" (March-May) 2010 season. There is likely to minimize the potential for Human-wildlife and community to community conflicts over the limited resources in these areas. However, close monitoring of any developments is necessary given that no significant rainfall is expected within the June-July-August period.

During chilly and cold days, people tend to close all windows and light jikos to keep themselves warm. It is advised that this practice should be avoided on the strength that the burning charcoal produces a poisonous gas called Carbon Monoxide that suffocates and even kills when inhaled under poorly ventilated conditions.

5.3 Health Sector

Cases of respiratory diseases like asthma, pneumonia and common colds (flu) are expected to be on the rise in areas such as Nairobi, Central highlands, Central Rift Valley and parts of the highlands west of the Rift Valley that will experience low temperatures. The general public is advised to put on warm clothing during this period to minimize chances of being affected. Health authorities are hence expected to be on the lookout to facilitate supply of drugs necessary to combat these diseases.

5.4 Transport and Public Safety

During the night and early morning, foggy and drizzly conditions are likely to result in reduced visibility and slippery roads in Nairobi, Central Province and parts of Rift Valley. This would be more frequent on the Nairobi-Naivasha highway. Areas around Makutano on Thika road and some parts of Mombasa road would also experience occasional poor visibility arising from foggy conditions. Motorists driving on these roads and anywhere else where foggy conditions have formed are advised to drive carefully in order to minimize accidents that would result from such weather conditions.

Occasionally, thick fog and associated very poor visibility may render landing at Jomo Kenyatta International Airport (JKIA) impossible. This may lead to diversion of aircrafts to other airports. Pollution mainly resulting from erosion by strong winds is also likely to reduce visibility in the ASALs and affect small aircrafts flying in low levels, especially over Garissa and Marsabit areas where the low level jet steams have their core.

Afternoon flights on the Nairobi-Kisumu route are advised to be weary of turbulent conditions around Kericho due to thick cumulonimbus cloud formations. Small aircrafts should avoid such areas of thick clouds.

Pollution mainly resulting from erosion by strong winds in the Arid and Semi Arid Lands (ASALs) is likely to reduce visibility in the ASALs and affect small aircrafts flying in low levels, especially over Garissa and Marsabit areas where the low level jet steams have their core.

5.5 Water Resources Management and the Energy Sectors

The “Long Rains” were adequate to fill the dams for power generation and for domestic use. The situation is not likely to deteriorate during the coming three months although the June-September is generally a dry period over most of central highlands including Nairobi.

5.6 Environment

The risk for forest fires in the Arid and Semi Arid Lands (ASALs) is high due to the anticipated dry conditions combined with relatively strong winds during June-August period.

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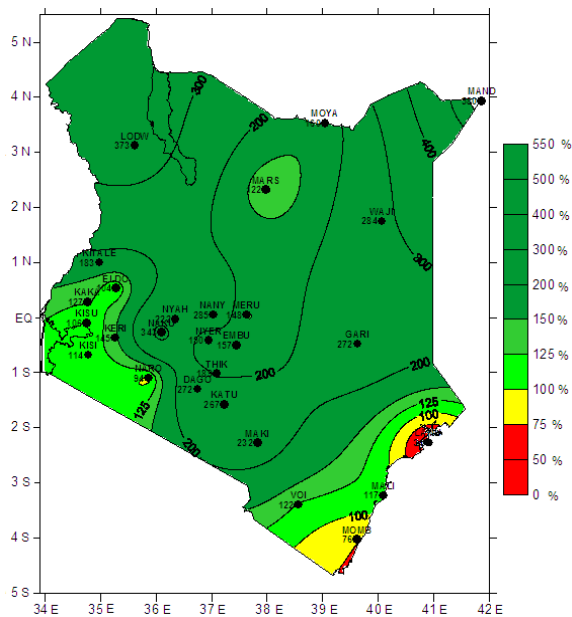


Figure 1a: %March 2010 Rainfall Performance

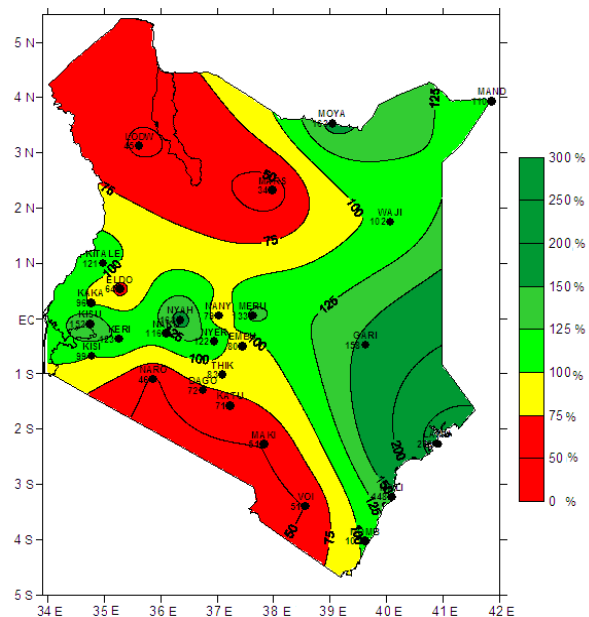


Figure 1b: %April 2010 Rainfall Performance

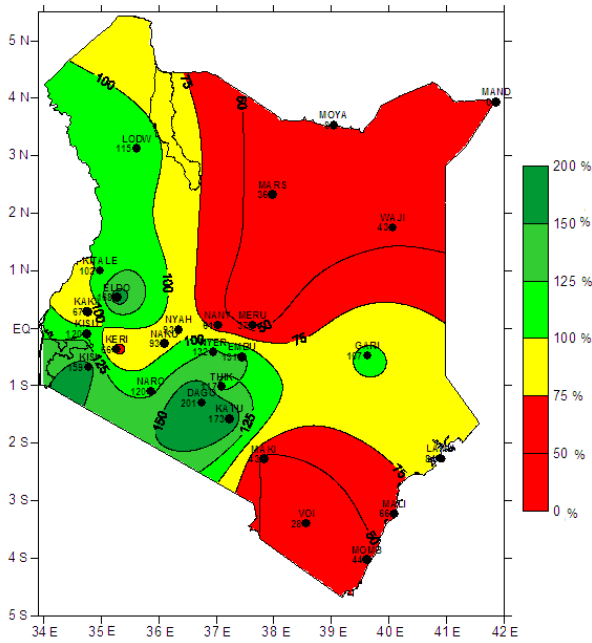


Figure 1c: %May 2010 Rainfall Performance

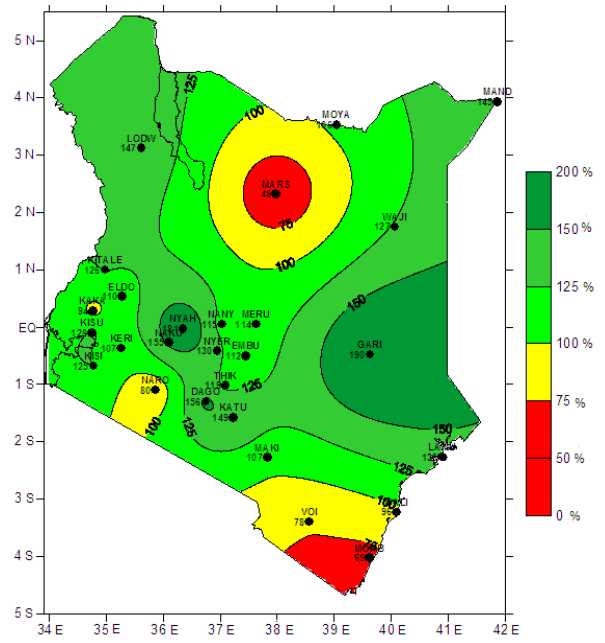


Figure 1d: %MAM 2010 Rainfall Performance

