



REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT AND MINERAL RESOURCES

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PRESS RELEASE

REVIEW OF THE WEATHER IN MARCH-APRIL-MAY (MAM) AND JUNE-JULY-AUGUST (JJA) 2009 SEASONS AND THE OUTLOOK FOR THE OCTOBER-NOVEMBER-DECEMBER 2009 "SHORT RAINS" SEASON

1. SUMMARY

Most parts of the country including the Western Highlands and the Coastal Strip recorded depressed rainfall during March-April-May 2009 "Long-Rains" Season. The resultant drought impacted severely on Agriculture, Livestock, Energy and Water Resource Management sectors by triggering famine; loss of livestock; electricity power rationing; and water rationing, among other adverse impacts. In June-July-August (JJA) 2009, the Western Highlands and the Coastal areas continued to record generally depressed rainfall while the rest of the country remained, on average, dry.

Cool and cloudy conditions prevailed in the Central Highlands and Nairobi area during JJA and particularly in the second half of July and the better part August.

The Climate Outlook for the "Short Rains" (October-November-December (OND)) 2009 season indicates that much of the country is likely to experience near-normal rainfall tending to above-normal (enhanced). The expected enhanced seasonal rains are driven by the presence of an evolving El Niño in the equatorial eastern Pacific Ocean coupled with a warming Indian Ocean in areas adjacent to the East African coastline. This El Niño is currently classified as moderate or mild compared with that of 1997/98. The distribution of the rainfall in time and space is expected to be generally good over most places.

2. REVIEW OF WEATHER

2.1 REVIEW OF MARCH-APRIL-MAY 2009 RAINFALL

An assessment of the rainfall recorded from 1 March to 31 May 2009 indicated that the performance of the "Long Rains" (March to May) seasonal rainfall was generally poor over most parts of the country. The poor performance was reflected both in the amounts received and the distribution in time and space. The total rainfall amounts received over most parts of the country were well below 75% of the Long-Term Means (LTMs); save for some stations in the western highlands. Many stations in the country received rainfall that was below 60% of the LTM. Highly depressed rainfall occurred in many places. Marsabit station to the north of the Eastern Province, for example, recorded rainfall that was just nine percent (9%) of its LTM, while the rainfall received over Garissa and Mandera in Northeastern Province and Lodwar in Northern Rift Valley Province recorded 18, 30 and 33 percent of their LTMs, respectively. Along the Coastal strip, the highest percentage of 34% was recorded at Mombasa while over the southeastern lowlands Makindu and Machakos recorded 27% and 46%, respectively. Most stations along the Coastal strip recorded very low rainfall amounts during the month of May, despite the fact that this is normally the peak rainfall month in the region during the "Long Rains" Season. All the stations at the Coast recorded less than 53% of their LTMs during the month of May with Mombasa recording the lowest (31%).

Localized and short-lived intense rainfall occurred in some areas such as Voi (in southeastern lowlands) and Wajir (in the northeastern areas). This contributed significantly to the seasonal rainfall totals. The two mentioned stations managed to record rainfall totals that were 99 and 71 percent of their LTMs in less than 5 days: A heavy downpour amounting to 131.3mm, for example, pounded Voi station on 8th April, 2009.

Analysis of rainfall shows that well distributed and significant rainfall amounts were recorded over isolated areas of the western highlands despite the late onset of the season. Localized areas in the central highlands including Nairobi area also recorded near normal rainfall amounts.

(The March-May 2009 Rainfall performance is shown in **Figures 1a**).

2.2 REVIEW OF WEATHER IN JUNE TO AUGUST 2009

2.2.1 RAINFALL IN JUNE-AUGUST, 2009

In June-July-August (JJA) 2009, most parts of the Western Highlands, Lake Victoria Basin and Central Rift Valley experienced, an average, depressed rainfall that occasionally spread to the central districts of the country including Nairobi. Moderate to heavy rainfall was, however, recorded in the western highlands in August. The rainfall performance over the Coastal areas was in the near-normal category with the rainfall amounts received being just about the same as the LTMs. The rest of the country remained generally dry as reminiscent of this time of the year. The June-July-August 2009 rainfall performance is shown in **Figures 1b**.

2.2.2 TEMPERATURE IN JUNE-JULY-AUGUST, 2009

The Central highlands and Nairobi area experienced occasional cool and cloudy conditions during the period. Analysis of June-July-August surface air temperatures, however, indicated that both the minimum (night-time) and maximum (day-time) temperatures for the period were warmer than average over most parts of the country. The average maximum temperature at Thika Meteorological Station, for example, was 2.8°C above average. In June, the daytime temperatures rarely fell below 22°C. Nevertheless, the surface air temperatures occasionally fell below 20°C in the months of July and August. Dagoretti Corner Meteorological Station recorded maximum temperatures as low as 17.7°C and 17.3°C on 7th and 23rd July, respectively while on 22nd July, Nyeri Meteorological Station recorded the lowest daily maximum temperature of 17.1°C.

3. EXPERIENCED IMPACTS ASSOCIATED WITH THE MARCH-APRIL-MAY 2009 “LONG RAINS”

The poor rainfall performance experienced over most parts of the country impacted negatively on various climate-sensitive sectors such as agriculture and livestock, energy, water resources management and health, among others. The impacts in some sectors such as water resources, energy and livestock were exacerbated by the fact that this was the fifth consecutive season that some of the areas were recording depressed rainfall. The impacts included:

- **Agriculture Sector:** Poor crop performance over most parts of the country including the southeastern lowlands, eastern highlands, central Rift Valley and parts of western highlands;
- **Livestock Development Sector:** Poor pasture conditions in pastoral areas that led to loss of livestock;
- **Public Health Sector:** Outbreak of cholera in some parts of the country especially during the month of April;
- **Water Resources Sector:** Water shortage for Drinking and Sanitation led to water rationing in the urban areas and more so in Nairobi;
- **Energy Generation and Distribution Sector:** Very low water levels in the Seven-Forks hydroelectric power generation dams that led to power rationing in the country.

4. FORECAST FOR OCTOBER-NOVEMBER-DECEMBER (OND) 2009

This climate outlook for the “Short Rains” (October-November-December) 2009 Season is mainly based on empirical statistical models developed from expected evolution of global Sea Surface

Temperatures (SSTs) anomalies, SST gradients and Southern Oscillation Index (SOI). The SST anomaly patterns taken into account include the evolving El Niño conditions in the eastern and central Equatorial Pacific Ocean coupled with warmer than average SSTs in the western Equatorial Indian Ocean (adjacent to the east African coast). The current El Niño conditions are projected to be moderate or mild compared to the El Niño of 1997/98. The expected onsets, cessation and the distribution of rainfall are derived from statistical analysis of past years (analogue years), which exhibited similar characteristics to the year 2009.

The outlook for October-November-December (OND) 2009 “Short Rains” Season indicates that most parts of the country are likely to experience enhanced rainfall that will be well distributed both in time and space.

The specific outlook for October-November-December (OND) 2009 is as follows:

The areas likely to receive **above-normal rainfall (enhanced rainfall)** include: **the Western Province** (Kakamega, Busia, Bungoma, Butere, Mumias, Vihiga etc.); **Nyanza Province** (Kisumu, Siaya, Rachuonyo, Nyamira, Kisii, Gucha, etc.); **Parts of Rift Valley Province** (Kericho, Nandi, Eldoret, Kitale); **North Eastern Province** (Ijara, Mandera, Elwak, Wajir, Garissa); **Coast Province** especially the coastal strip (Mombasa, Kilifi, Malindi, Msabaha, Lamu, Voi, Taveta, etc). These areas are shown in dark green colour in **Figure 2**

The areas likely to receive **near-normal rainfall with a tendency to above-normal (slightly enhanced rainfall)** include: **Much of Rift Valley Province** (Nakuru, Narok, Kajiando, Naivasha, Samburu, Baragoi, Lodwar, Lokichoggio, Lokitaung etc); **Nairobi Province** (Kabete, JKIA, Wilson, Moi Air Base); **Eastern Province** (Makindu, Machakos, Meru, Embu, Chuka, Nyambene, Moyale, Marsabit, etc); **Central Province** (Kiambu, Thika, Kerugoya, Sagana, Karatina, Maragua, Nyahururu, etc). These areas are shown in light green colour in **Figure 2**

5. ONSET AND CESSATION DATES

- **Nyanza and Western Provinces:** 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. The rains are likely to continue into January 2010;
- **North Rift:** The onset in the Northwestern parts of the country (Lodwar, Lokitaung, Lokichoggio etc) is expected during the second to third week of October while cessation is expected in the third to fourth week of the December;
- **Central Province, Northern half of Eastern Province and Northeastern Province:** Central Highlands (Meru, Embu, Nyeri, Murang'a, Nanyuki etc); Nairobi area (Dagoretti, Kabete, Eastleigh etc); and Northeastern Kenya (Moyale, Mandera, Wajir, Garissa, Marsabit) are expected to experience their onsets in the first to second week of October. The rains are likely to extend into January 2010 over the central districts while ceasing during the third to fourth week of December over the Northeastern districts;
- **Central Rift:** The Central Rift Valley areas (Nakuru, Narok, Nyahururu etc) are likely to experience the onset during the second week of October. The rains are likely to extend into January 2010, especially in the Narok areas;
- **Southern part of Eastern Province and part of Coast Province:** The southeastern lowlands (Voi, Taveta, Makindu, Tana River) are likely to realize the onset during the second to third week of October. The cessation is expected during the last week of December;
- **Coastal Strip:** Onset over the Coastal strip (Lamu, Malindi, Mombasa, Kilifi, Mtwapa Msambweni, Lungalunga, etc) is expected during the first to second week of October and cessation during the fourth week of December. (The expected onset and Cessation dates are shown in **Figures 3a and 3b**).

6. EXPECTED RAINFALL DISTRIBUTION

Rainfall distribution within the “Short Rains” Season of 2009 is expected to be generally good over most places in the country including the Arid and Semi-Arid Lands (ASALs). Heavy storms are likely to occur during the season, and more so, during the rainfall peak month of November. However, the levels of enhancement are not likely to reach those that were recorded in 1997/98 period.

7. POTENTIAL IMPACTS OF THE OND 2009 RAINS

7.1 Agriculture, Food Security and Livestock Development Sectors

The current food security situation indicates that over ten million Kenyans are affected by famine. Rainfall deficits in the last 4 to 5 seasons extended to some agriculturally high potential areas and densely populated areas of Rift Valley and parts of the Central region. There will be timely onset over most of the "Short Rains" dependent areas.

The rainfall expected over most agricultural areas of the country would be adequate for good crop performance. Farmers, are therefore, advised to work closely with the Ministry of Agriculture and take advantage of the expected good rainfall performance, the extended rainfall season, and extended length of the growing period, to maximize on the crop yield.

However, enhanced rainfall in Western Kenya may coincide with harvesting activities in parts of Rift Valley (Uasin Gishu, Trans Nzoia etc), thus interfering with the activities. The emergency measures that are currently in place due to food insecurity in the country should be sustained till March 2010. *In order to enhance food security, storage facilities should be built in every province for easier access and distribution of food to the needy.*

Pasture conditions in the pastoral areas of Northeastern Kenya are expected to improve significantly as a result of expected enhanced rainfall during the season. The Ministry of Livestock Development is therefore advised to work closely with pastoralists to assist them in acquiring or restocking livestock to replace the ones that have died as a result of the current severe drought.

6.1 Environment, Forestry and Wildlife Sectors

The Ministry of Environment and Mineral Resources is urged to take advantage of the expected enhanced rainfall and encourage people in various parts of the country to put in place soil conservation measures to minimize environmental degradation due to soil erosion, especially in riparian areas along rivers and streams. The rains are expected to be quite adequate for tree planting in order to increase the already depleted forest cover in the country and allow re-generation of forest cover.

Municipalities are encouraged to urgently construct storm drainage systems and open up clogged drainages to avoid piling of floodwaters in cities and towns from surface runoff triggered by rain showers.

7.2 Disaster Management Sector

Flooding and land/mudslides are likely to occur in prone areas of Western, Lower Tana and Central Kenya. Areas to watch out for flooding include the Northeastern areas around Garissa, lower Tana, Kano plains in Nyanza and Budalang'i in Western Province. Other areas prone to landslides / mudslides are Murang'a area and Nandi Hills areas. Heavy storms accompanied by lightening are also expected in Western Kenya especially 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 and Kericho-Nandi Hills areas. 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. It is advisable not to drive in a severe storm accompanied by wind gust and where visibility is impaired. In such events, motorists are advised to stop and wait for the storm to subside. Motorists are also advised not to drive their cars across streams where water is about 2 ft in depth to avoid being washed away. It should be noted that running water has an enormous force.

7.3 Health Sector

Cases of Malaria and other water-borne related diseases may increase due to the expected enhanced rainfall. The Ministry of Health is, therefore, requested to take the necessary mitigation measures such as mapping the potential vulnerable areas of disease outbreaks and stocking of appropriate drugs in order to cope with any outbreaks of such maladies. Owing to high temperatures and humidity in the latter part of the season, the potential for outbreak of Highland Malaria in the high ground areas is likely. The likelihood of the outbreak of Rift Valley Fever is potentially likely in North

Eastern parts of the country and at the Coast.

7.4 Transport and Public Safety Sector

The expected enhanced rainfall is likely to lead to muddy and slippery conditions on the roads in most parts of the country. 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. 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.

Aircrafts flying to the Western part of the country (Kisumu, Eldoret, etc) are advised to be aware of the high convective activities and turbulence over the Kericho-Nandi Hills area and avoid flying directly into Cumulo Nimbus (raining) clouds.

7.5 Water Resources Management Sector

Urban areas such as Nairobi, Nakuru, Mombasa, Malindi, and Lamu among others are likely to experience flash floods that may occasionally disrupt human activities. Clearing and unblocking of drainage systems in urban centres is, therefore, necessary before the start of the “Short Rains” Season. On the other hand, water for domestic activities (drinking and sanitation) is expected to improve significantly from the current low levels. Despite the improvement, there is still need for increasing the capacity of water storage dams that caters for residents of cities with fast growing populations like Nairobi, Mombasa and Kisumu; water harvesting, construction and rehabilitation of existing boreholes and dams.

7.6 Energy Generation Sector

The major river basins are forecasted to receive normal rainfall tending to above-normal. This means that surface water run-offs will register high flows in rivers found within in the respective basins/water shed areas. The main catchment areas for the country’s hydroelectric power generating dams are thus expected to receive adequate rainfall that is expected to recharge the major rivers such as Tana, Athi, Nzoia, Nyando, Yala and Ewaso Nyiro. It is, therefore, expected that the hydroelectric power generation in the Seven-Folks dams will improve significantly.

7.7 Trade, Commerce and Industry Sectors

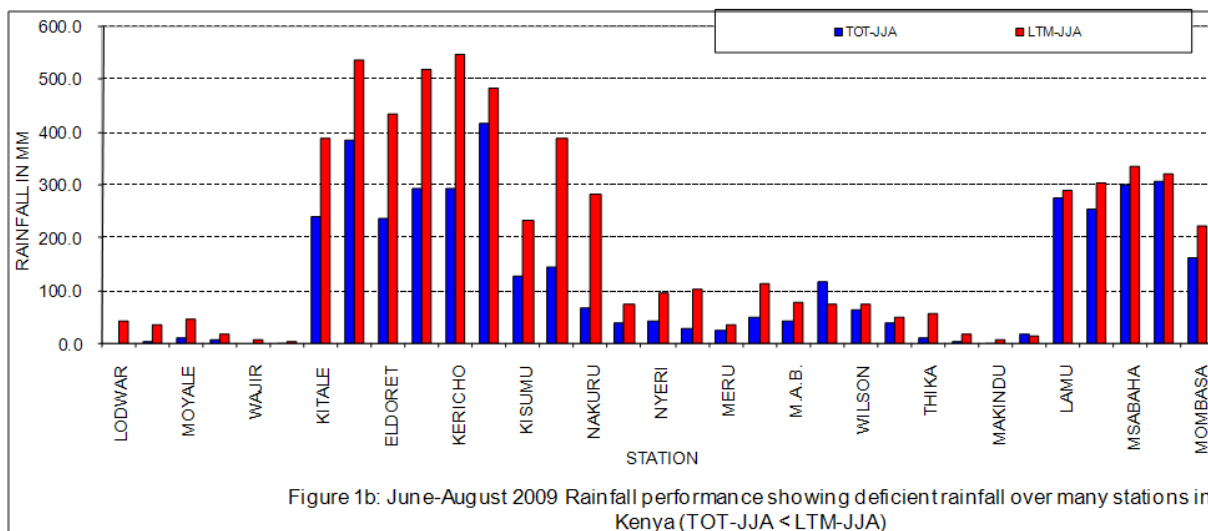
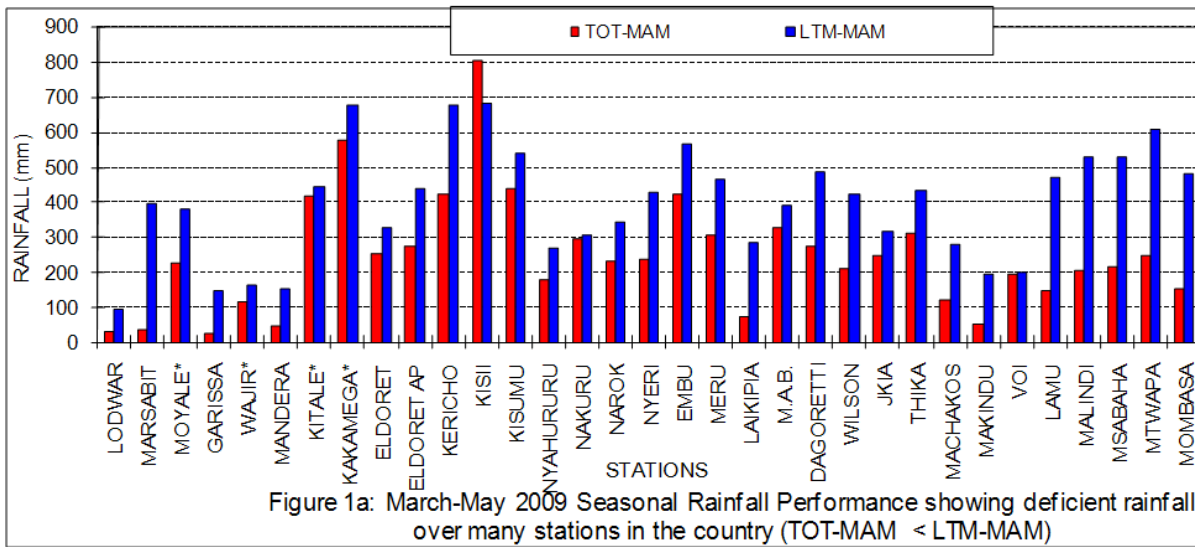
Some sections of the road network in the country turn out to be muddy and slippery resulting to vehicles stalling in the muddy sections. Damaged transport infrastructure like bridges occasioned by landslides in some areas may occur. This may lead to late delivery or non-delivery of raw materials and industrial products to the industries and distribution outlets respectively.

The forecast should be used as guidance in planning and preparedness by 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.

N.B: This forecast should be used in conjunction with the four-day, weekly and monthly forecasts including updates issued by this Department.

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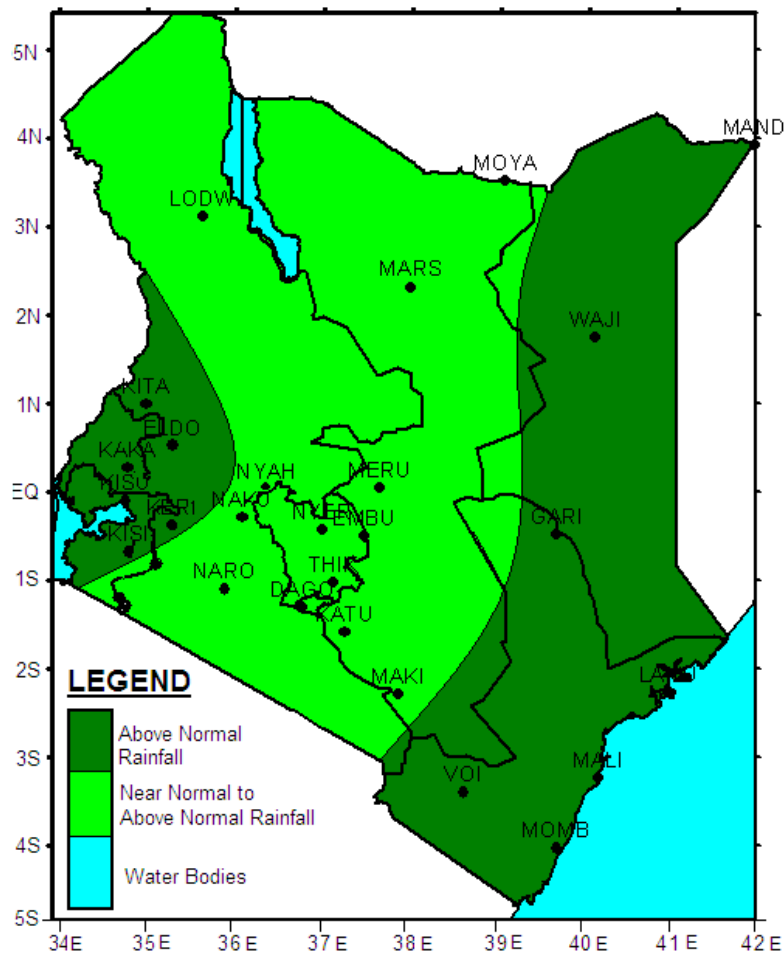


Figure 2: Rainfall Outlook for October-December 2009 “Short-Rains” Season showing enhanced rainfall over most parts of the country

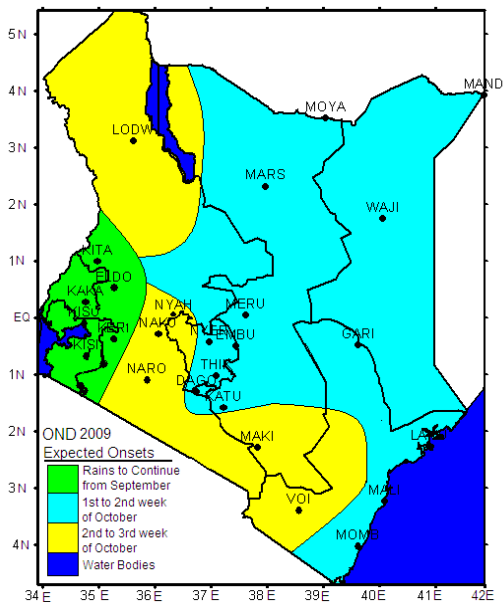


Figure 3a: Expected Onset Dates for OND2009 “Short-Rains” Seasonal Rainfall

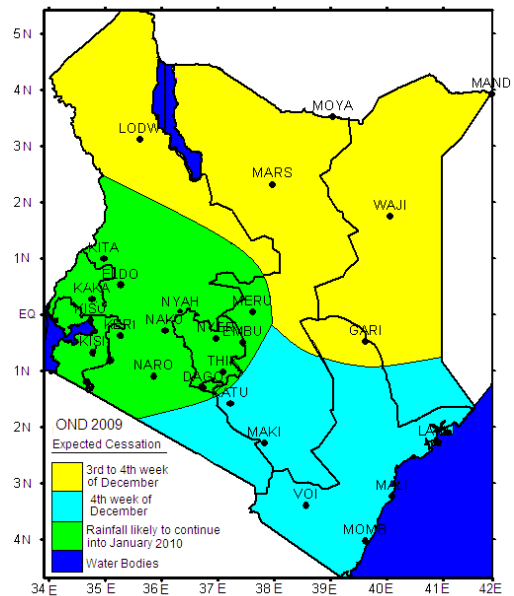


Figure 3b: Expected Cessation Dates for OND2009 “Short-Rains” Seasonal Rainfall