INTEGRATED MARCH–APRIL–MAY (MAM) 2026 CLIMATE OUTLOOK

TANA AND ATHI RIVER BASINS

This report presents a consolidated seasonal outlook for the March–April–May 2026 period, integrating both rainfall and temperature probability forecasts derived from ICPAC model outputs and processed through GIS analysis. The objective of this assessment is to interpret the spatial probability of climate anomalies and evaluate their combined implications for hydrology, water resource management, reservoir operations, and agricultural planning within the Tana and Athi River Basins.

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1. SEASONAL CLIMATE SUMMARY

1.1 Rainfall Outlook

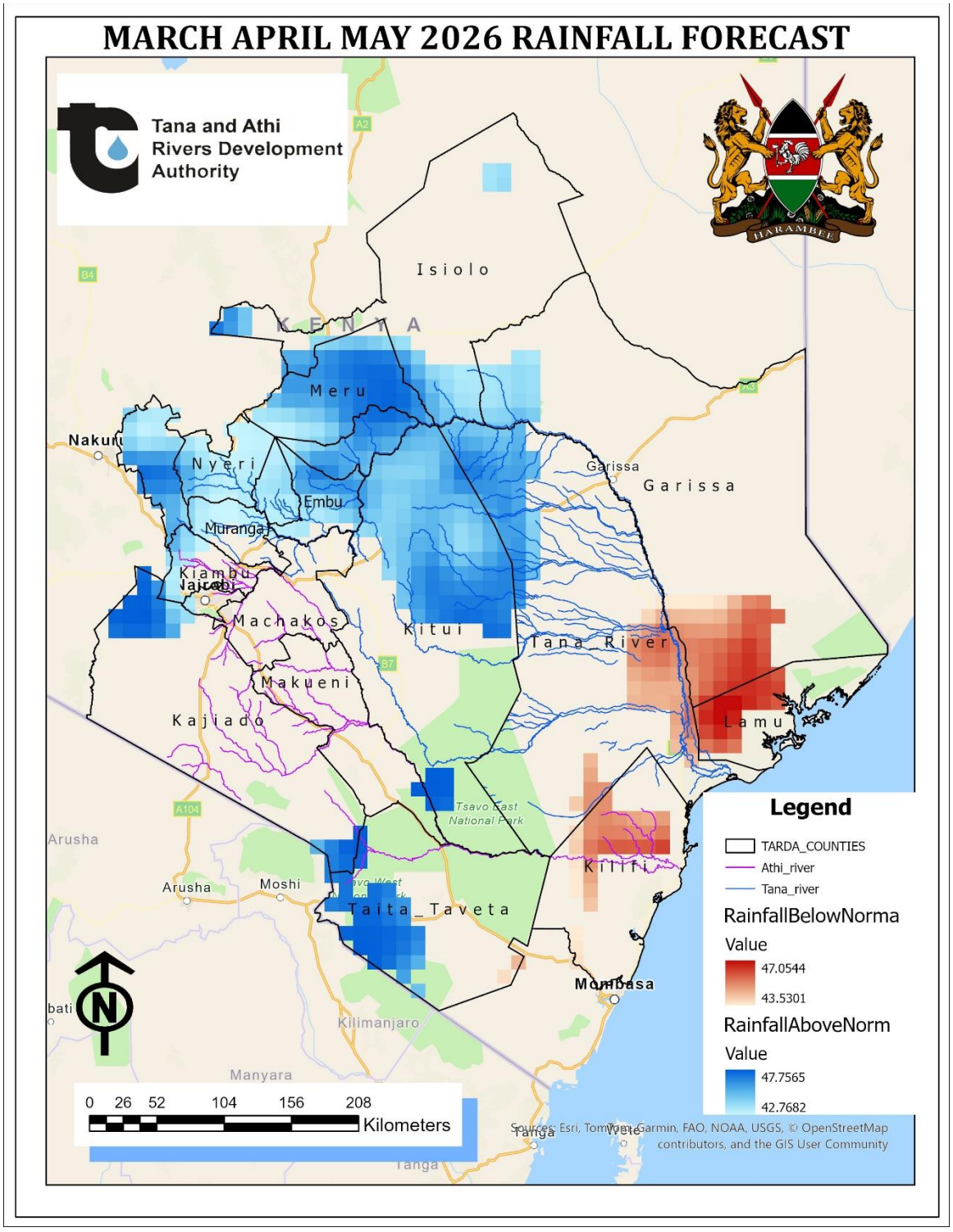

Figure 1: March-April-May Rainfall Forecast for the Tana and Athi River Basins.

The MAM 2026 rainfall forecast is expressed in terms of the percentage probability that seasonal rainfall will fall within Above Normal, Near Normal, or Below Normal categories. The forecast indicates that the Upper Tana Basin and parts of the Upper Athi Basin have a higher probability of experiencing above-normal rainfall. In

contrast, the Lower Tana Basin and selected coastal and southern lowland areas show a higher probability of Below Normal rainfall.

Counties likely to receive Above Normal rainfall include Meru, Nyeri, Kirinyaga, Embu, western Kitui, Machakos, Makueni, northern Kajiado, and the highland sections of central Taita Taveta. These areas form the primary headwater catchments and therefore play a dominant role in basin hydrology.

Counties likely to receive Below Normal rainfall include Tana River County, Lamu County, the southern Taita Taveta lowlands, and parts of southern Kajiado and central Kilifi. These areas are predominantly low-lying and semi-arid.

Incorporation of the Mid-February 2026 Rainfall Forecast

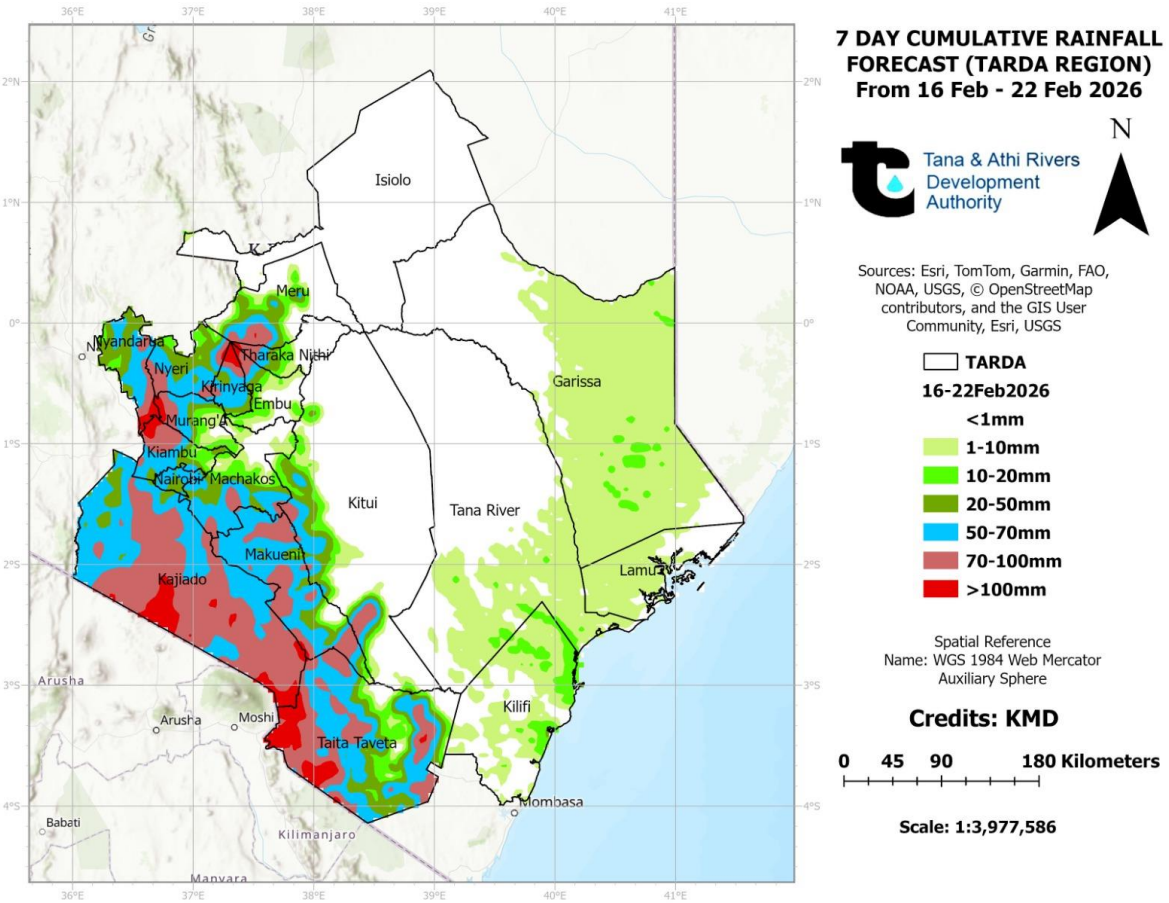

Figure 2: Mid February 2026 Rainfall Forecast

The 7-day cumulative rainfall forecast for 16 to 22 February 2026 indicates that rainfall activity has already intensified across several upper and southern parts of the basin.

Rainfall exceeding 100 mm is forecast over parts of Kajiado and southern Taita Taveta. Accumulations between 70 and 100 mm are projected over sections of

Murang'a, Nyeri, Meru, and the Aberdare and Mount Kenya catchments. Totals between 50 and 70 mm are expected over Nairobi, Kiambu, Machakos, Makueni, Embu, and parts of Kirinyaga.

In contrast, Garissa, Tana River, and Lamu are forecast to receive light rainfall generally between 1 and 20 mm.

This early rainfall distribution closely aligns with the seasonal probability outlook. It reinforces the Above Normal rainfall signal over Upper Tana and Upper Athi while maintaining the Below Normal signal over Lower Tana. The February rainfall does not alter the seasonal categories but increases confidence in early runoff generation in headwater areas and confirms spatial rainfall contrasts within the basin.

1.2 Temperature Outlook

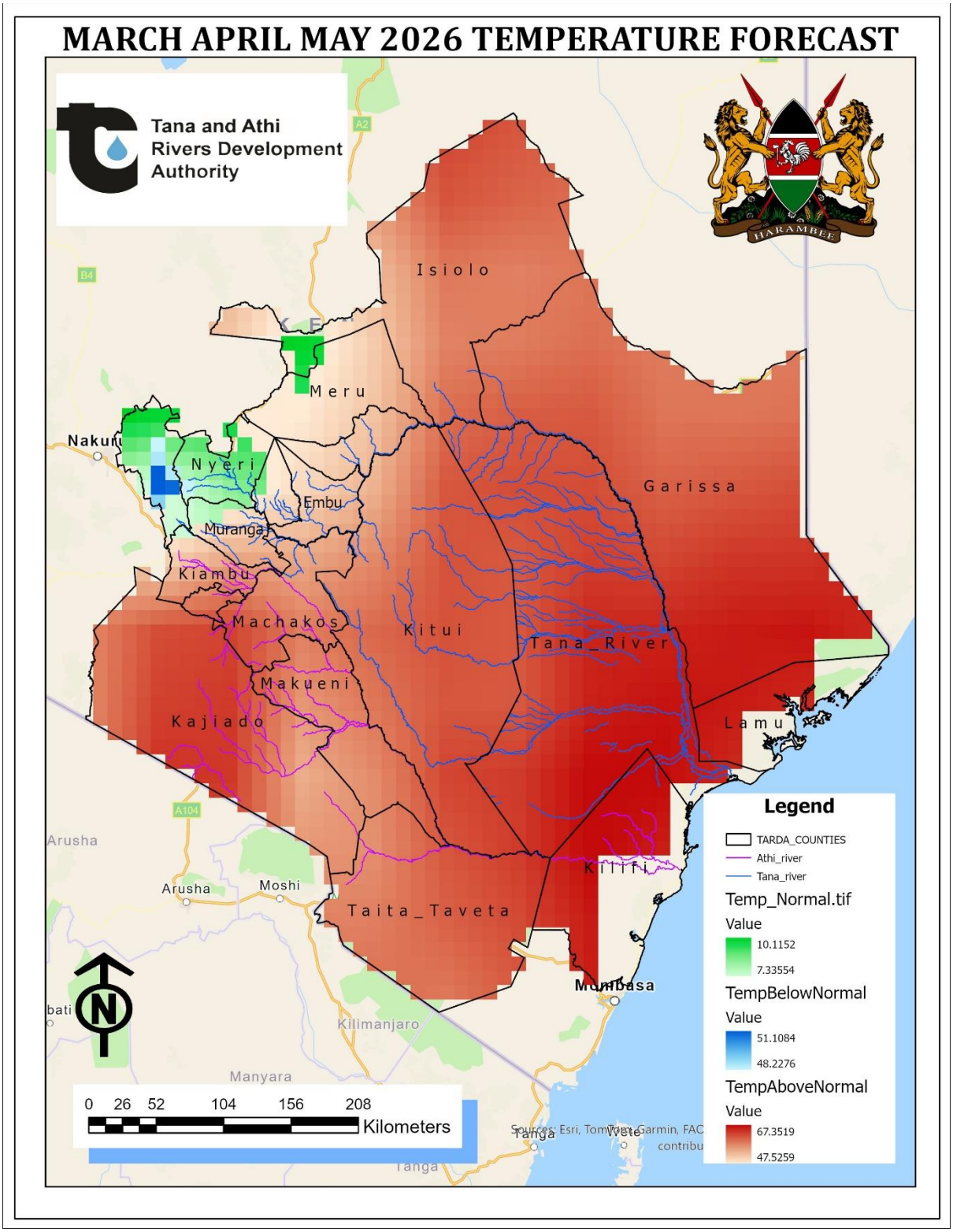

Figure 2: ***March-April-May Temperature Forecast for the Tana and Athi River Basins.***

The temperature forecast indicates a strong and consistent probability of above-normal temperatures across the entire basin. The probability of above-normal temperatures ranges from approximately 47.5 to 67.4 percent, while the

probability of below-normal temperatures remains very low, ranging from 7 to 10 percent.

The highest probability of extreme warmth, exceeding 60 percent, is concentrated in semi-arid and lowland regions. These areas include Isiolo and the northeastern Upper Tana fringe, as well as Kajiado County and the southern Athi Basin near the Tanzania border.

Moderate to high probabilities, ranging between 51 and 60 percent, extend across Machakos, Makueni, Kitui, Murang'a, Kiambu, Nyeri, and Embu. Even high-altitude areas around Mount Kenya and the Aberdare Ranges are projected to experience warmer than average conditions except their peaks, which are expected to experience normal to below-normal temperatures.

The early February rainfall does not change the temperature outlook. However, in areas where rainfall has begun, elevated temperatures are likely to increase evapotranspiration rates, partially offsetting soil moisture gains.

2. INTERACTION BETWEEN RAINFALL AND TEMPERATURE

The seasonal outlook must be interpreted as an integrated climate signal rather than as two separate forecasts.

In the Upper Tana Basin, the probability of above-normal rainfall combined with confirmed early February rainfall suggests enhanced runoff generation and increased river discharge earlier than originally anticipated. However, the simultaneous probability of above-normal temperatures will increase evapotranspiration rates and reservoir evaporation losses.

In the Lower Tana Basin, the combination of below-normal rainfall probability, limited February rainfall totals, and above-normal temperature probability significantly elevates drought risk. Reduced precipitation combined with enhanced evaporative demand will intensify soil moisture deficits and water stress.

In the Upper Athi Basin, February rainfall exceeding 50 mm in several areas confirms early soil moisture recharge. However, higher temperatures will increase crop water requirements and reduce net soil moisture retention efficiency.

3. BASIN-BASED IMPACT ANALYSIS

3.1 Tana Basin

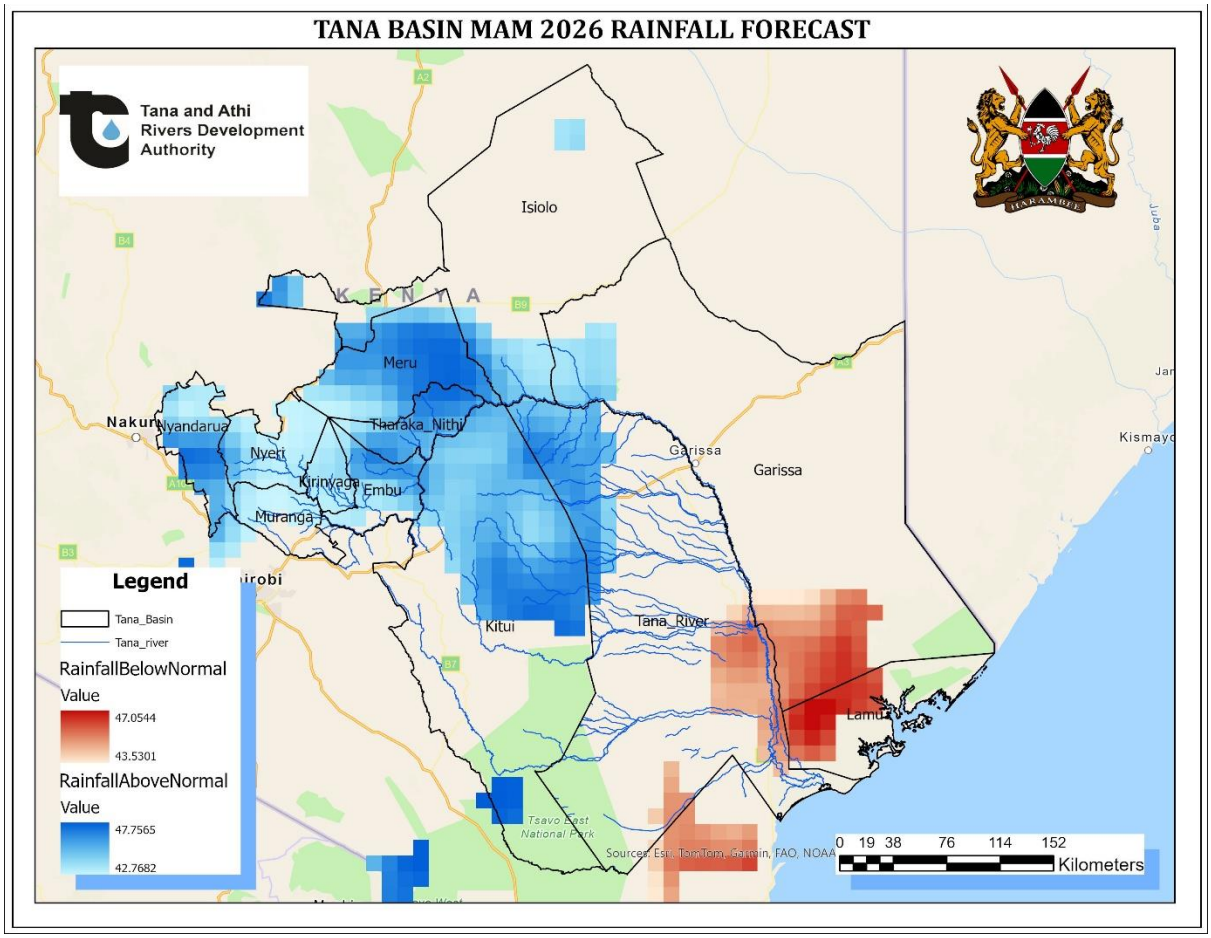

Figure 2: March-April-May Rainfall Forecast in Tana River Basin

In the Upper Tana catchment, including Meru, Nyeri, Kirinyaga, and Embu counties, February rainfall between 70 and 100 mm in several zones supports the seasonal probability of Above Normal rainfall. Early runoff into River Tana and its tributaries is therefore likely.

Although temperatures are expected to be Above Normal, the substantial rainfall volumes in these highland zones are likely to offset temperature driven losses. The net hydrological effect is expected to be increased river discharge and improved reservoir inflows beginning earlier in the season.

In Isiolo and adjacent semi arid zones, the probability of extreme warmth remains highest within the basin. Rainfall totals remain comparatively lower than in the highlands, and elevated temperatures are expected to increase evaporation rates and reduce effective soil moisture.

In the mid Tana region, including Kitui, moderate Above Normal rainfall probability combined with high temperature probability suggests seasonal improvement in streamflow but increased agricultural water demand.

In the Lower Tana Basin, including Tana River and Lamu counties, February rainfall remains light and consistent with the Below Normal seasonal probability.

The combination of rainfall deficit and Above Normal temperatures creates a high likelihood of drought conditions and limited floodplain recharge.

3.2 Athi Basin

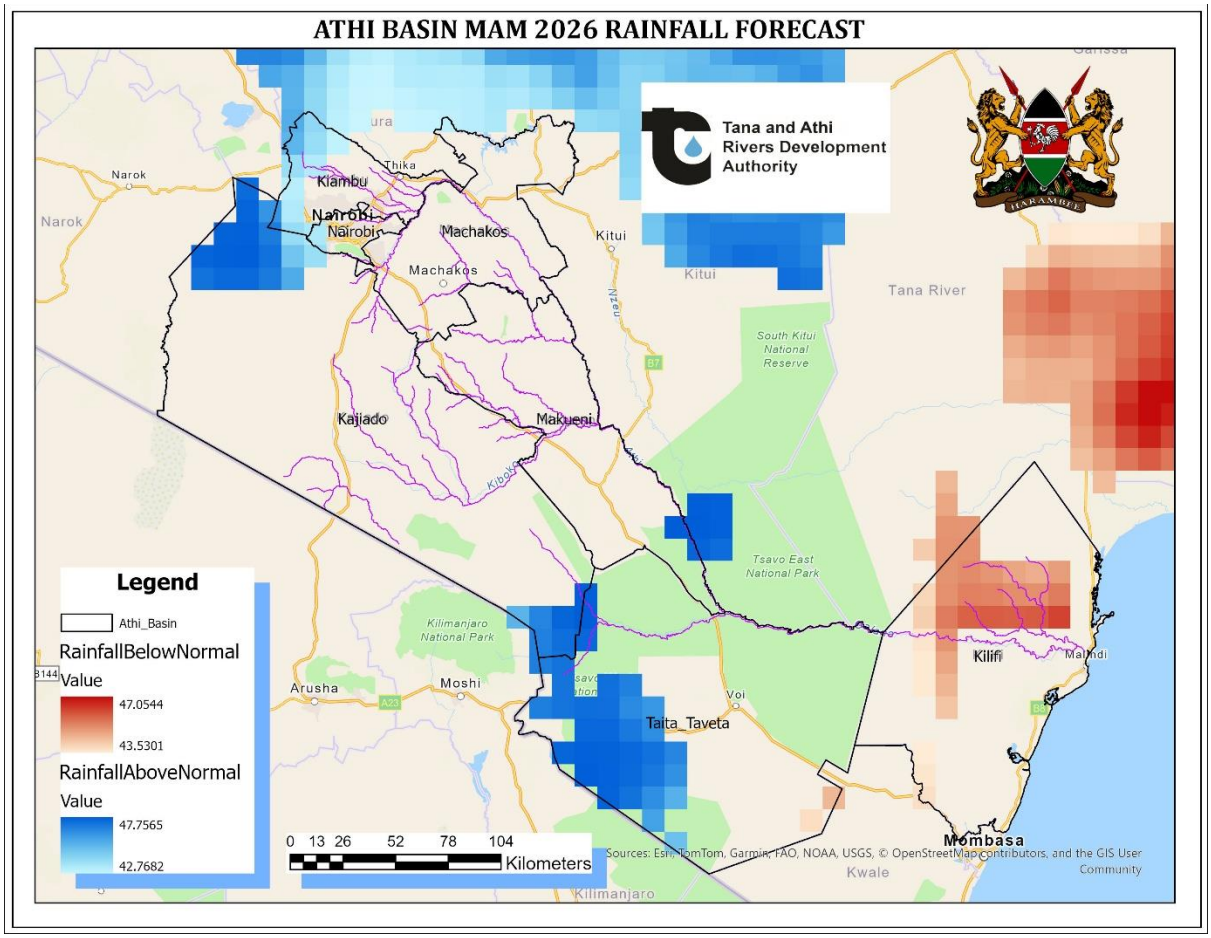

Figure 2: March-April-May Rainfall Forecast in Athi River Basin.

In the Upper Athi Basin, including Machakos and Makueni counties, February rainfall between 50 and 70 mm confirms early season activation. The probability of Above Normal rainfall indicates improved runoff generation potential. However, the elevated temperature outlook will increase evapotranspiration rates and irrigation demand.

In southern Athi Basin areas such as Kajiado, rainfall exceeding 100 mm in localized zones indicates potential short term flood risk in low-lying areas. However, the probability of extreme warmth remains particularly high. If rainfall becomes intermittent later in the season, heat stress may quickly intensify moisture deficits despite early rainfall gains.

4. IMPLICATIONS FOR MASINGA AND KIAMBERE DAMS

4.1 Masinga Dam

Masinga Dam is primarily influenced by rainfall in the Upper Tana catchment. February rainfall exceeding 70 mm in several headwater zones suggests that inflows may begin increasing earlier than previously anticipated.

The probability of above-normal rainfall during MAM further supports the likelihood of elevated inflows. However, Masinga Reservoir remains highly susceptible to evaporation due to its size and shallowness. The projected above-normal temperatures will increase evaporative losses. Net storage gains will therefore depend on rainfall persistence through March and April.

4.2 Kiambere Dam

Kiambere Dam receives regulated inflows from the upstream cascade system. Enhanced rainfall in the Upper Tana Basin increases the probability of improved inflows into the reservoir. However, higher temperatures will also increase evaporation rates.

The overall outlook suggests that storage levels are likely to stabilize or improve, provided rainfall materializes as forecast and reservoir operations are optimized.

5. RIVER SYSTEM RESPONSE

River Tana is expected to experience increased headwater discharge due to above-normal rainfall probability in the Upper Basin. Flood risk may increase in upstream and midstream sections if rainfall events are intense. Downstream sections may not receive significant local rainfall but may still experience elevated flows due to upstream dam releases.

River Athi is expected to experience seasonal flow enhancement in upper tributaries. However, high temperatures and evapotranspiration will reduce net water availability in the semi-arid lower sections.

6. AGRICULTURAL AND WATER RESOURCE IMPLICATIONS

Higher temperatures across both basins will increase crop evapotranspiration rates. This means that irrigation schemes will require more water to achieve similar yield outcomes compared to average seasons.

In Lower Tana and southern Athi areas, the combined signal of heat and rainfall deficit increases drought risk.

In the Upper Basin areas, improved rainfall may support agricultural productivity, although water demand will remain elevated.

7. MONITORING AND OPERATIONAL RECOMMENDATIONS

Reservoir storage levels at Masinga and Kiambere should be monitored daily to assess net water balance changes. Evaporation rates should be closely tracked to refine seasonal water balance modelling. River stage and discharge data from WRA gauge stations should be analyzed for early detection of flood pulses. Weekly assessments should integrate cumulative rainfall performance with temperature-driven evaporation estimates.

8. OVERALL SEASONAL OUTLOOK

The MAM 2026 season remains highly likely to be warmer than average across the entire Tana and Athi River Basins. Rainfall is likely to be Above Normal in Upper Tana and parts of Upper Athi and Below Normal in Lower Tana and selected southern lowlands.

The mid February rainfall confirms early seasonal activation in upper and southern catchments and strengthens confidence in the projected above-normal rainfall zones. However, it does not alter the below-normal rainfall probability in Lower Tana.

The season will therefore be characterized by spatial contrasts, with wetter headwaters, hotter lowlands, and persistent drought risk in downstream semi-arid areas. The balance between sustained rainfall and temperature-driven water losses will determine the net hydrological outcome for reservoirs, river systems, and water users across the basin.