

The background is a solid blue color. In the upper right corner, there are several thin white lines that appear to be part of a grid or a stylized graphic element. The text is centered in the middle of the page.

GIS/REMOTE SENSING
MONTHLY REVIEW BULLETIN
FOR NOVEMBER 2024

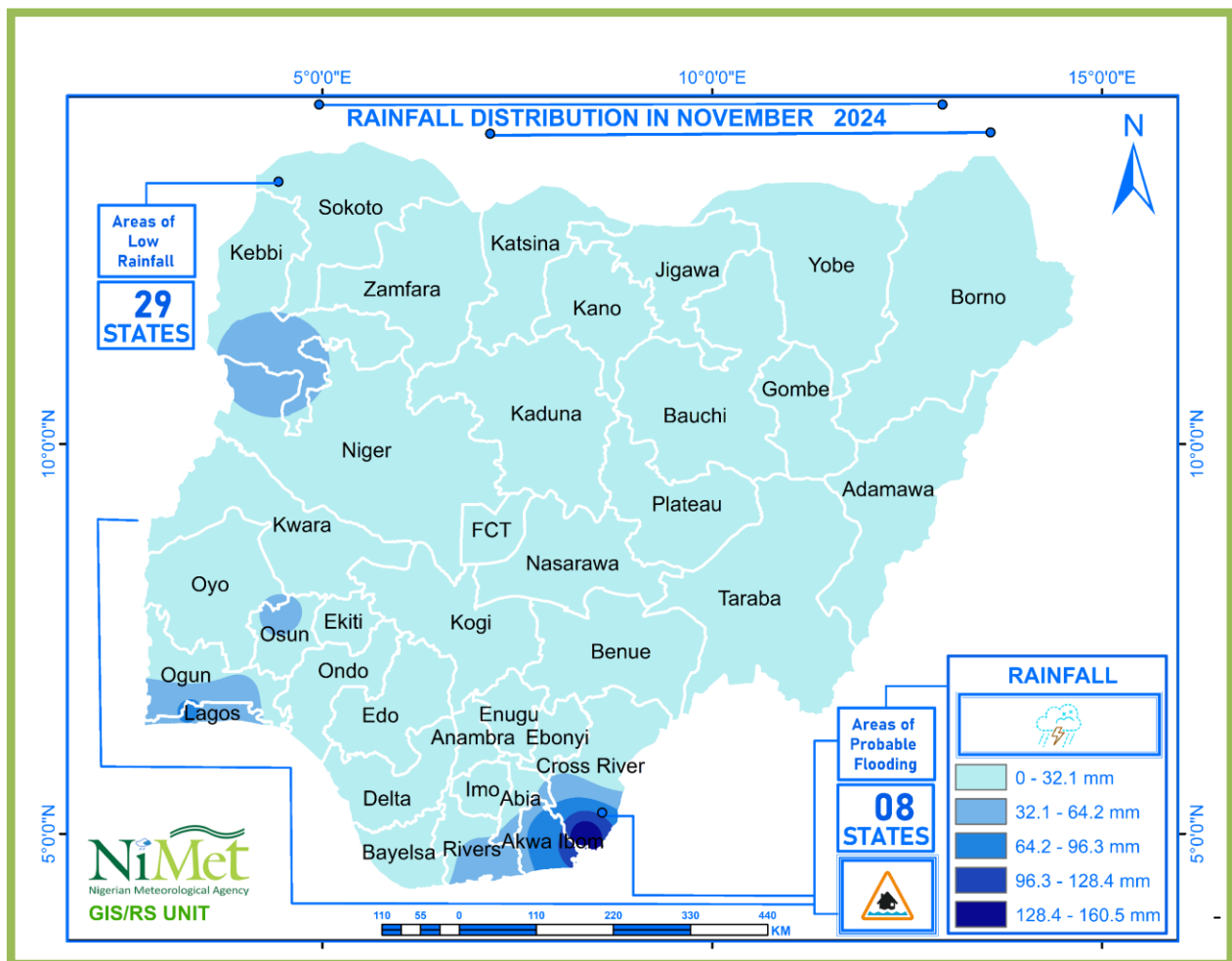
GIS/REMOTE SENSING MONTHLY REVIEW BULLETIN FOR NOVEMBER 2024

PREAMBLE

This GIS/Remote Sensing Monthly Review Bulletin for November 2024 is used to Assessing climate impacts and areas at risk which requires an interdisciplinary approach, leveraging data from demographics, social sciences, and environmental applications that traditional weather analysis packages are not optimized to handle. GIS technology gives the user virtually limitless potential to analyze and contextualize data from a multitude of observations and models to identify climate

1.0 RAINFALL DISTRIBUTION

1.1 RAINFALL DISTRIBUTION OVER NIGERIA IN NOVEMBER 2024



1.1.1 OBSERVED FEATURES: The rainfall distribution in November 2024 shows significant rainfall activities majorly across the southern parts of Nigeria with little or no rainfall activities in the northern and central states. The rainfall amounts Experienced ranged between 1.0mm and 160.8mm in the southern parts of Nigeria with Katsina and Yelwa in the northern states experiencing rainfall amount of 11.9mm and 52.8 mm respectively.

1.1.2 ADVISORIES:

State Emergency Management Agencies in the Southern and the Northern states of the country are advised to access and disseminate NiMet's rainfall forecasts. The forecasts are helpful for identifying vulnerable and flood-prone communities and enable them mitigate the impacts of potential flooding especially the release of water from Lagdo Dam. This proactive approach can significantly reduce the risk to lives and property in these regions.

1.2 DIGITAL ELEVATION MODEL OF NIGERIA

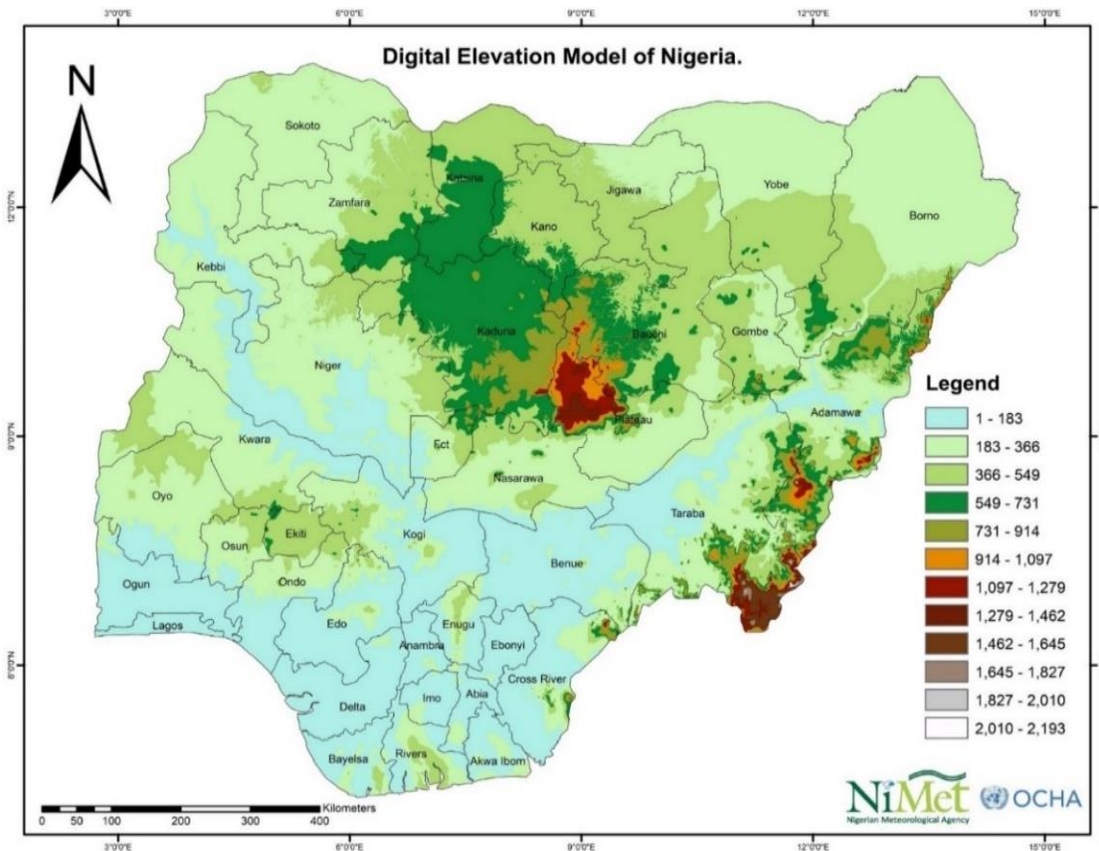


Figure 2: Digital Elevation Model for Nigeria, depicting the Geographical positions of high and low areas

1.2.1 OBSERVED FEATURES:

A Digital Elevation Model (DEM) represents the Earth's topographic surface devoid of vegetation, buildings, and other surface structures. DEMs are widely utilized to show the natural terrain without plant cover and human-made features. They consist of a grid of elevation values referenced to a common vertical datum, typically measured in meters, providing a continuous depiction of elevation across a topographic area as illustrated in Figure 2. Elevations across Nigeria range from 1 meter to 2193 meters. The highest elevations are found in parts of Bauchi, Plateau, Kaduna, Taraba, Adamawa, and Cross River States, while the lowest points are located in Lagos, Delta, and sections of Ondo, Edo, Bayelsa, Rivers, and Akwa Ibom states.

1.2.2 ADVISORIES:

Elevated areas above sea level and areas with steep slopes are susceptible to erosion and landslides. In the event of heavy rainfall, local authorities and residents in these regions are advised to be mindful of these potential risks and take proactive actions to reduce the risks.

Flooding: Areas with low elevation are naturally susceptible to flooding in Nigeria. Lagos, Delta, and portions of Ondo, Edo, Bayelsa, Rivers, and Akwa Ibom states have low elevation and therefore vulnerable to flooding. Preparedness for potential flooding and construction of effective drainage systems are important adaptation measures in such areas.

Infrastructure Development: Thorough planning is crucial when constructing physical infrastructure in areas with varying elevations. In hilly and mountainous terrains, it is imperative to implement adequate engineering measures to ensure stability such as appropriate strength of materials and soil profile analysis.

Ecological Concerns: Mountainous regions often host unique ecological systems. To protect these natural environments, it is essential to implement good ecological practices such as, biodiversity conservation, climate change adaptation and adopt other sustainable environmental practices such as afforestation.

1.3 PROBABLE FLOOD RISK IN NOVEMBER 2024

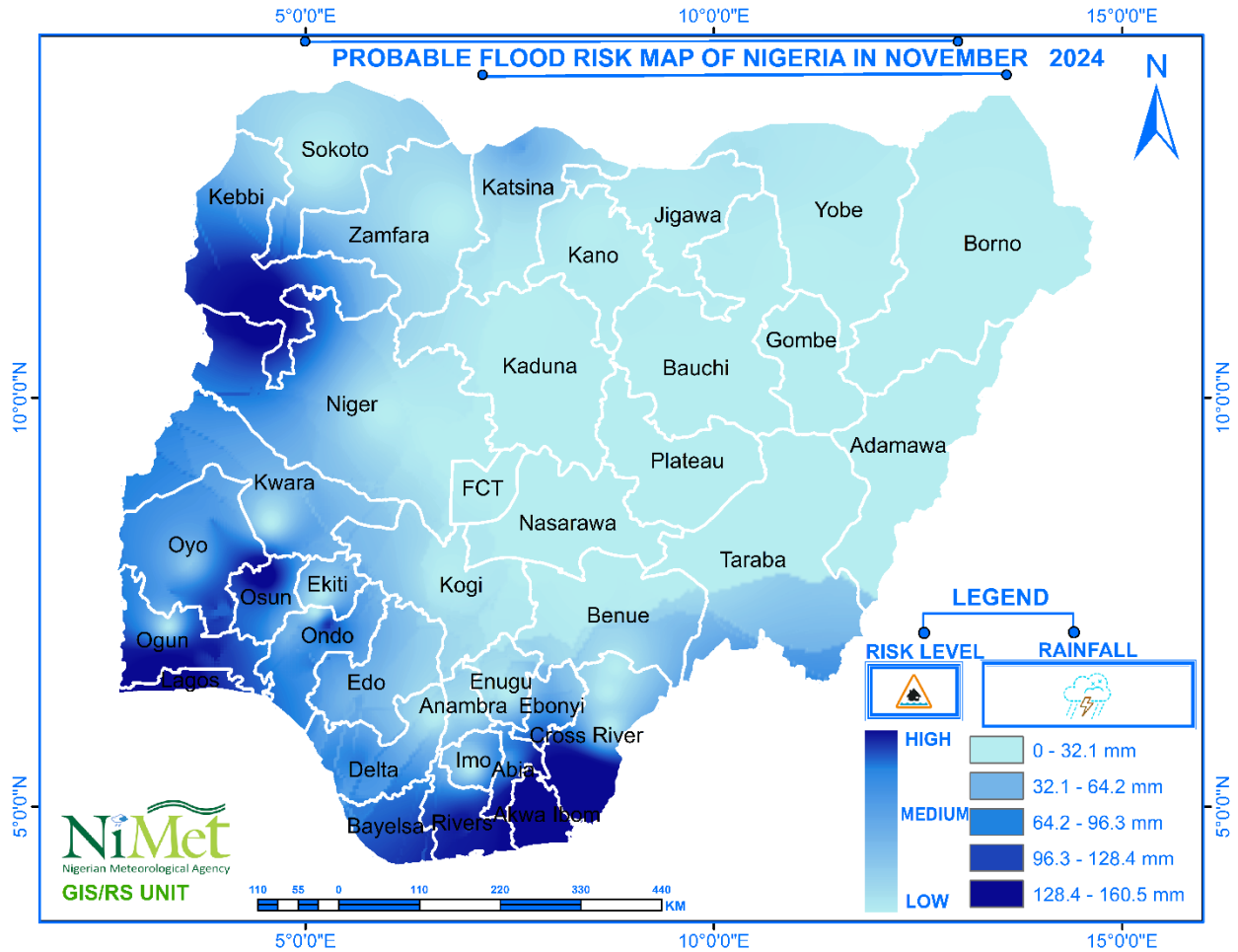


Figure 3: Map indicating Areas of high, medium and low wetness in November 2024

Table 1: Classification of flood Risk According to Geopolitical zones

S/N	Geo-political Zones	States	Risk Level
South West			
1		Ogun	High Risk
2		Lagos	High Risk
3		Osun	Medium High Risk
4		Ondo	Medium High Risk
5		Oyo	Medium High Risk
6		Ekiti	Medium High Risk
South East			
		Imo	Medium-High Risk
1		Ebonyi	Medium-High Risk
2		Anambra	Medium High Risk
3		Abia	Medium-High Risk
4		Enugu	Medium-High Risk
South South			
		Delta	High Risk
1		Rivers	High Risk
2		Akwa Ibom	High Risk
3		Bayelsa	Medium High Risk
4		Edo	High Risk
5		Cross River	High Risk
North Central			
1		Kwara	Medium High Risk
2		Benue	Medium Risk
3		Kogi	Low Risk
4		Kaduna	Low Risk
5		Plateau	Low Risk
6		Niger	Medium Low Risk
7		Abuja	Low Risk
8		Nasarawa	Medium Low Risk

North East			
1		Taraba	Low Risk
2		Borno	Low Risk
3		Yobe	Low Risk
4		Bauchi	Low Risk
5		Gombe	Low Risk
North West			
1		Jigawa	Low Risk
2		Kano	Low Risk
3		Kebbi	Low Risk
4		Katsina	Low Risk
5		Sokoto	Low Risk
6		Zamfara	Low Risk

Table 2: States Showing High Risk of Flooding in November 2024.

S/N	STATE	SUSCEPTIBILITY LEVEL (%)
1.	AKWA IBOM	45.5
2.	CROSS RIVER	38.3
3.	RIVERS	2.5
4.	OSUN	1.8
5.	KEBBI	1.7
6.	NIGER	1.2
7.	OGUN	2.2
8.	LAGOS	15.6

Map of River Overlay with Flood Risk Areas of November 2024.

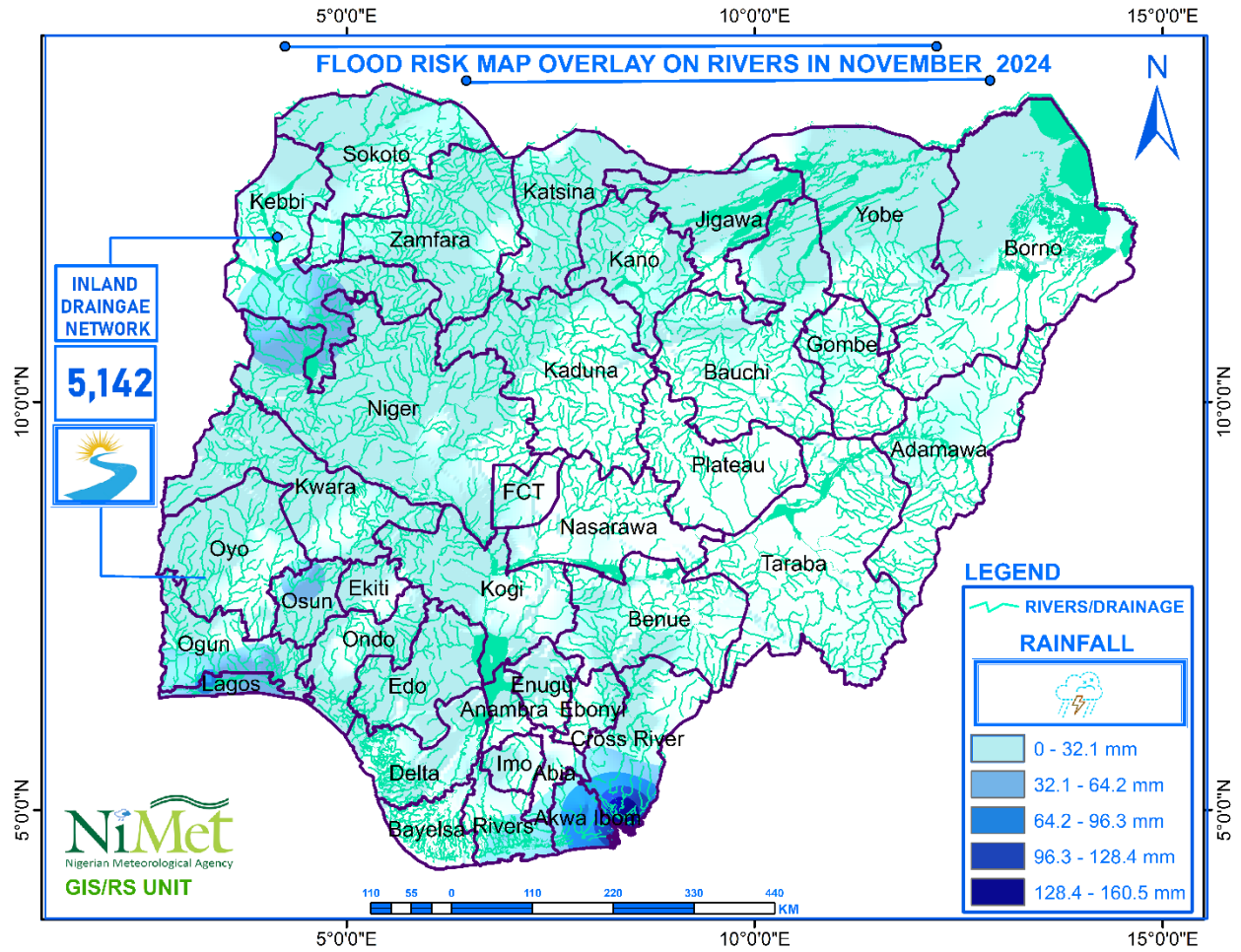


Figure 4: Map of River Overlay with Flood Risk Areas of November 2024.

1.3.1 OBSERVED FEATURES:

Flood risk map overlay on major rivers in Nigeria indicating potential flooding activities in and around rivers in the country. Also, climatic features such as rainfall, rivers shape file are used to determine these environmental hazards. This is used for identifying rivers that are prone to flooding. Figure 4 shows that the south-west regions such as Lagos, Osun, Ogun and some South-East states like parts of Edo, Uyo, Akwa-Ibom, Warri and Cross Rivers state are mostly at risk of river flooding during the month.

Considering topographic landscape and rainfall characteristics, Figure 4 indicates the south-west, south-east and south-south regions that are prone to river flooding

1.3.2 ADVISORIES:

Plans for Evacuation: Local authorities are advised to formulate and share evacuation protocols with residents in vulnerable areas along river banks, identifying secure shelter locations and escape routes. Also, people living in flood-prone areas should ensure proper clearing of debris in and around rivers and other water channels.

1.4 AREAS IN NIGERIA AT HIGH RISK OF FLOODING IN NOVEMBER 2024

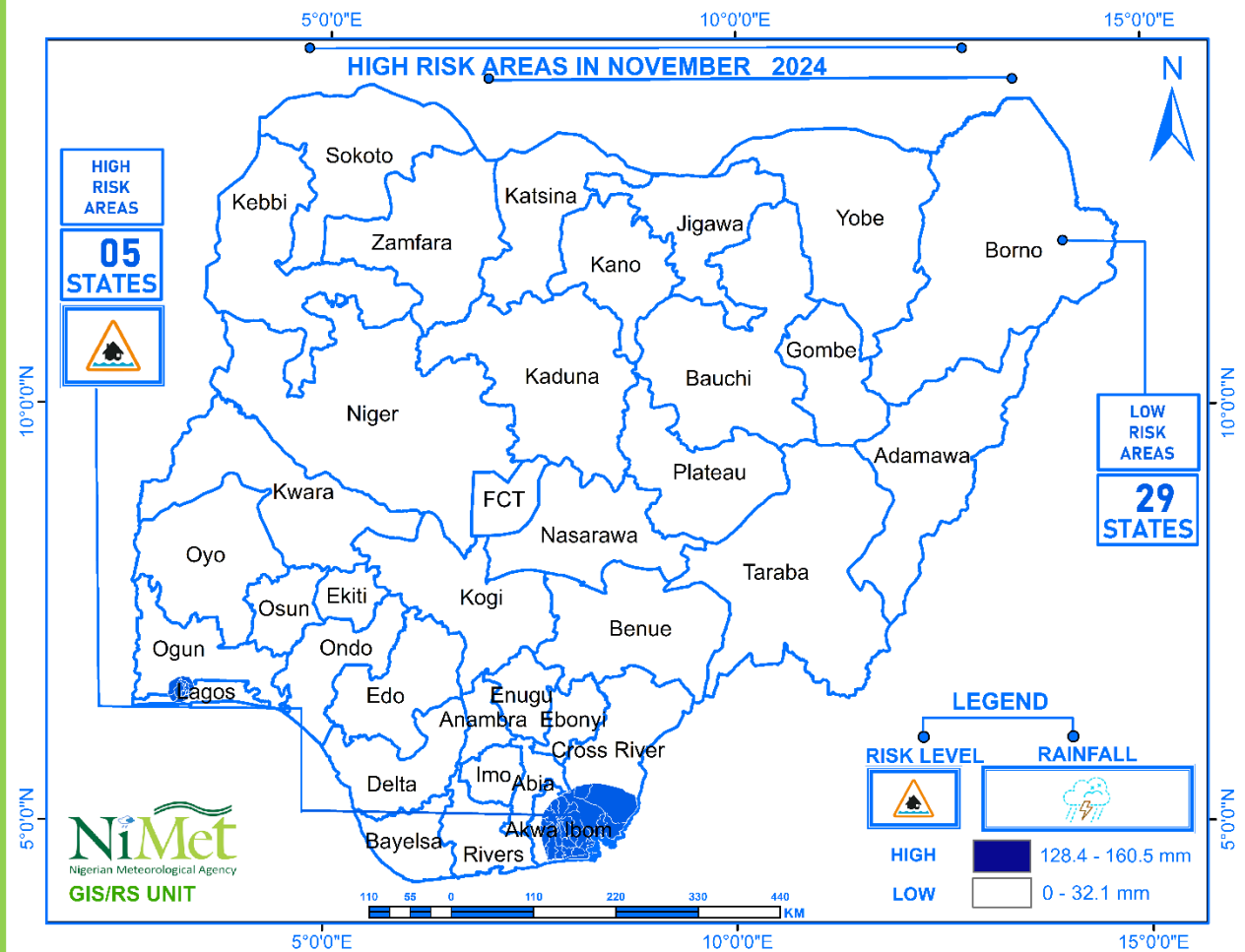


Figure 5: Map Depicting Location of High and Low Risk Areas in November 2024

1.4.1 OBSERVED FEATURES:

With further examination of potential flood risk zones as shown in Figure 5, states with likelihood of flood occurrence have been identified. Akwa-Ibom, Cross River, Rivers, Osun, Uyo and Lagos states are at high risk areas. The flood risk levels in term of percentage is outlined in Table 2.

1.4.2 ADVISORIES:

Plans for Evacuation: Local authorities are advised to formulate and share evacuation protocols with residents in vulnerable areas, identifying secure shelter locations and escape routes.

Promoting Community Awareness: Residents are encouraged to follow guidance from local authorities and stay informed about weather forecasts. State Meteorological Inspectors (SMI) should effectively disseminate weather information, ensuring that emergency contact details for local response teams and services are easily accessible to the public.

Residents in high-risk areas should take precautionary measures to protect lives and valuable properties.

Keep Up with the News: Monitor local news and weather reports regularly, paying attention to guidance provided by emergency services and local authorities. It is important to stay updated on weather and flood information from NiMet and Nigeria Hydrological Service Agency (NIHSA). Local authorities should initiate and communicate evacuation plans for vulnerable areas, identifying safe shelters and evacuation routes before flooding occurs.

1.5 SOIL MOISTURE INDEX ACROSS NIGERIA IN OCTOBER 2024

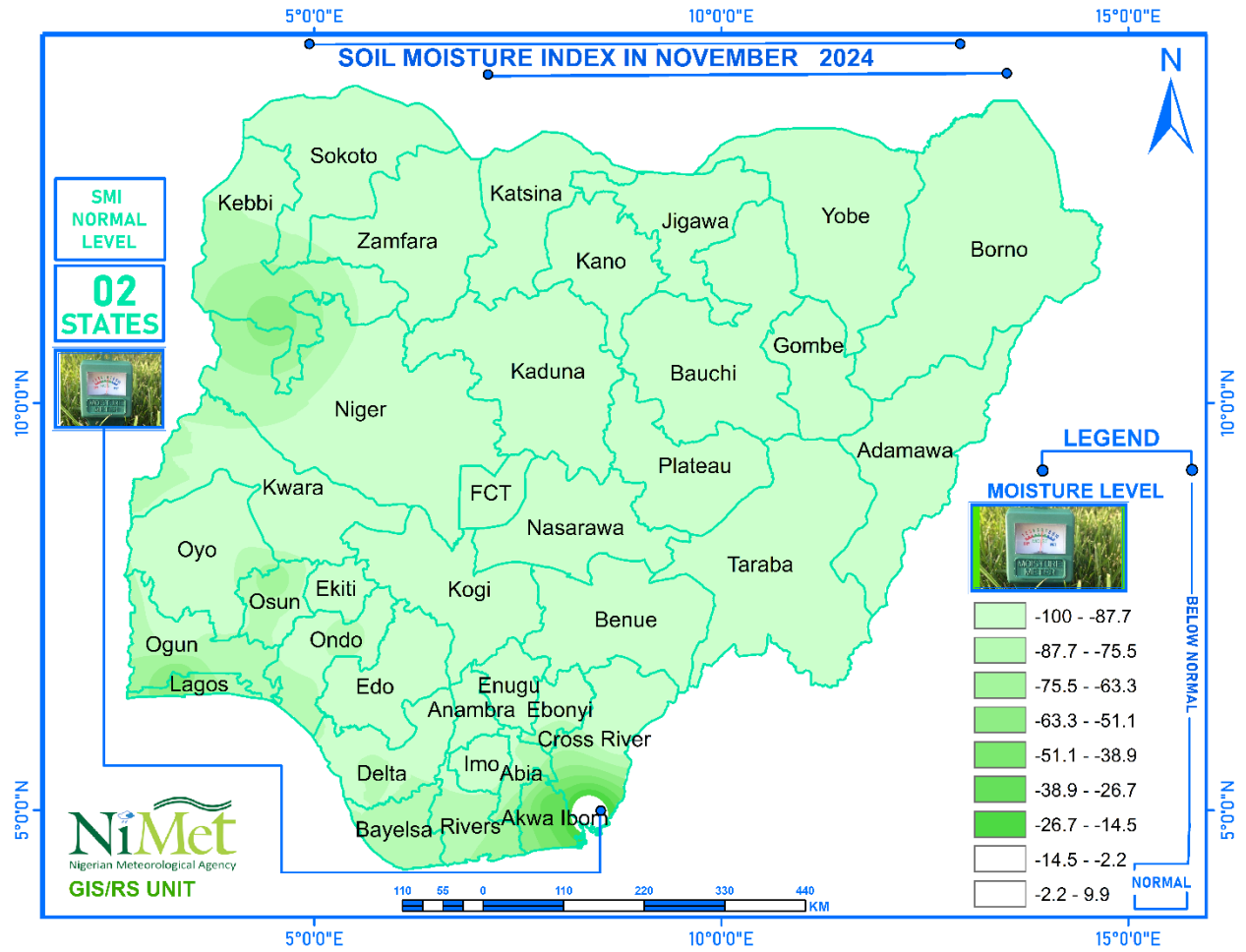


Figure 6: The Soil Moisture Index across Nigeria depicting areas of soil moisture saturation that may be prone to flood in November 2024.

1.5.1 OBSERVED FEATURES:

The soil moisture conditions across the country in November 2024 is illustrated in the Soil Moisture Index (SMI) map (Figure 6). As shown in the map, the soil moisture over most parts of the country were below normal except in parts of Uyo, Cross Rivers and Akwa-Ibom states that had normal soil moisture condition during the period under consideration.

It is expected that some parts of the south east region like Uyo, Rivers and Akwa ibom that are experiencing normal soil moisture index are still likely to experience flood within the period.

1.5.2 ADVISORIES:

Adequate precautions and mitigation measures to reduce the impact of flooding in the South-South, South-East and areas that have above normal soil moisture should be implemented.

1.6 RELATIVE HUMIDITY DISTRIBUTION ACROSS NIGERIA IN NOVEMBER 2024

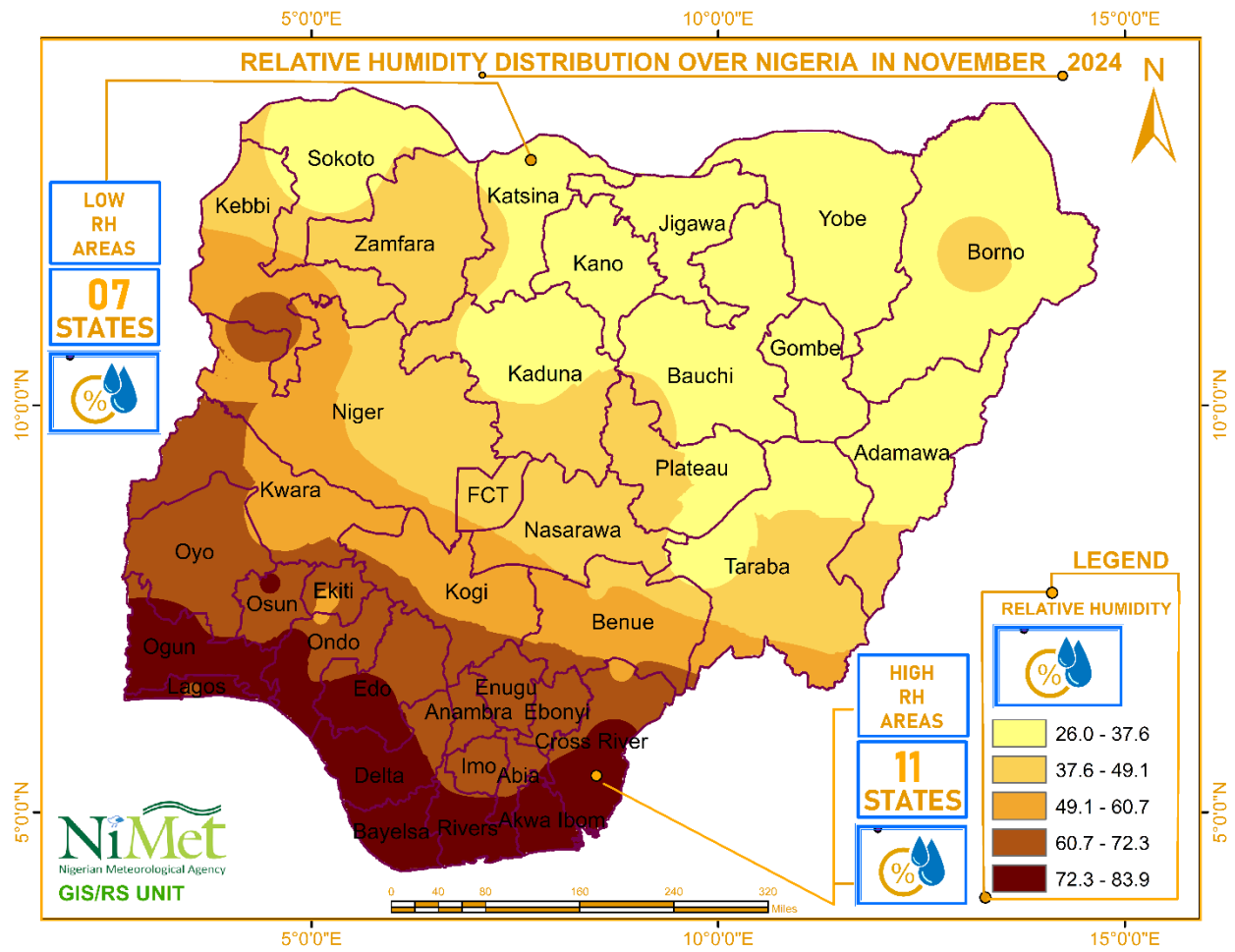


Figure 7: The Relative Humidity Distribution over Nigeria in November 2024

1.6.1 OBSERVED FEATURES:

Figure 6: shows the relative humidity over Nigeria in November 2024. The distribution across the country is characterized by the following features:

- The Relative Humidity (RH) over the north-eastern part of the country range between 26.0% and 37.6%, except for parts of Borno state which recorded 37.6% to 49.1%.
- The North-western region including parts of Kebbi and Zamfara experienced relative humidity ranging between 37.6% and 49.1% during the period.
- Relative humidity ranges between 49.1% and 60.1% was observed majorly over Kwara, Kogi, Benue and parts of Niger states.
- High Relative Humidity ranges between 72.3% and 83.9% was observed mainly over most places in the South- Western, South – Eastern and South-South region apart from parts of Anambra, Abia and Enugu states which experience relative humidity ranges between 60.7% and 72.3%.

1.6.2 RECOMMENDATIONS:

1. For south-west, South-south and south-eastern parts of the country, the following are recommended:
 - Improve ventilation: Open doors between rooms to increase circulation. You can use fans or move furniture to promote air flow.
 - Use an air conditioner: Air conditioners reduce humidity by cooling the air.
 - Dry clothes: Use a dryer or dry clothes outdoor.
 - Keep surfaces dry: Keep surfaces dry to reduce humidity.
 - Use descants: Decants can help reduce humidity.

2. For north-eastern parts of the country and pockets of areas in the north-western parts of Nigeria, the following are recommended:
 - Use a humidifier: You can install a humidifier directly to your heating and cooling system or purchase individual units for rooms. Portable humidifiers are a quick and easy to manage low humidity.
 - Add houseplants: Houseplants can help increase humidity
 - Cook on the stovetop: Cooking on the stovetop can help increase humidity.
 - Leave the door Open when showering: Leaving the door open when showering can help increase humidity
 - Place bowls of water on register: This can help increase humidity

