

NIGERIAN METEOROLOGICAL AGENCY (NiMet)

2018

**Seasonal Rainfall
Prediction (SRP)**



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NiMet
Nigerian Meteorological Agency



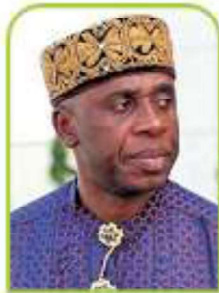
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FOREWORD



In a bid to survive and make life more convenient, man has explored his natural environment; removing vegetation cover either to make a habitation, reach natural resources beneath the earth surface or till the earth surface to produce food. Some of these resources needed to be processed before final consumption, leading to establishment of manufacturing industries. All these, man did without regard to his environment. Today, there are tell-tale signs of man's indiscriminate exploitation. The Ozone layer is thinning out, there is increase in sensible heat, and increase in urban pollution, depleting carbon sinks; leading to increase in carbon dioxide levels and other greenhouse gases in the atmosphere. Global warming has become an issue, ice caps are melting, and there is threat to coastal cities, change in rainfall amount, duration and distribution, and variability, length of growing season. There is therefore a great need for a good knowledge of climate science as well as application of these knowledge to help adapt to changes being witnessed as well as curbing further changes. The Seasonal Rainfall Prediction (SRP) prepared yearly by the Nigerian Meteorological Agency (NiMet), is one of such tools that seek to bridge the gap between climate and human endeavor.

NiMet's SRP is produced to help decision makers in the various socioeconomic sectors like agriculture, construction, transport, manufacturing etc. to make informed decision ahead of time for better results. The SRP contain predictions of the onset and cessation dates of the rainy season, length of rainy season, amount of rainfall, and temperature forecast for the first four months of the year.

The 2018 SRP is based on the tele-connection

between the El Nino Southern Oscillation (ENSO), Sea Surface Temperature (SST) anomalies over both Pacific and Atlantic Oceans and rain bearing weather systems over Nigeria. The cold phase (La Nina) of the ENSO is expected to prevail in the early part of the season (January to March), and thereafter change to the neutral phase by April and expected to prevail until August. The model output shows a normal to warmer than normal temperature with high levels of night time discomfort during the hot season especially over the North east. Rainfall onset and cessation are also expected to be normal. This will lead to a normal length of the growing season and normal rainfall amount. The good news is that there are no grave dangers to agricultural practices. However, it is advisable to use early maturing varieties to be on the safe side. Early maturing crops can also enhance the chance of cultivating twice within the planting season.

NiMet's SRP had predicted cases of flooding in 2012, 2016 and 2017, and it has been proven that these predictions did eventually pan out. I recommend that all stakeholders, decision makers, and indeed the state and federal government institutions saddled with planning and implementation in all rainfall sensitive sectors should, take note of the information contained in the 2018 SRP, and do well to plan with them and prepare in advance for any eventualities. The Nigerian Meteorological Agency is committed to serving the public better and will keep monitoring in order to alert the public of any new developments with regards to the 2018 rainy season.

Rt. Hon. Rotimi C. Amaechi

Honourable Minister,

Federal Ministry of Transport

Abuja.

March, 2018



NiMet has been mandated by law to provide weather and climate information, advisories and services to all its stakeholders. This is to enable the stakeholders in these sectors such as

agriculture, transportation, tourism, water resources management, health, environment, communication, budget and planning etc. take better and science based decisions in fulfillment of this mandate, NiMet has therefore produced the 2018 edition of the SRP in order to minimize potential risks and damages from weather and climate hazards, mitigate and adapt to the effects of the weather hazards on food, lives, installations, environment and the economy. In previous editions, the 2018 forecast is produced based on the strong tele-connection between the El-Nino Southern Oscillation (ENSO), Sea Surface Temperature (SST), and the rain bearing systems over Nigeria.

2018 is predicted to experience dual phases of ENSO (La-Nina and Neutral phases). The season is expected to start with a La-Nina phase in the first quarter of the year and a neutral phase from the 2nd quarter continuing through to the end of the year. The forecast is also based on cereal (maize and millet) crop model which incorporates soil information, farming practices, and available climatic data from 46 NiMet synoptic stations spanning for a period of at least 30 years. The model uses all the parameters to calculate and predict the planting dates (rainfall onset), rainfall cessation dates, length of season and total annual rainfall amount for 2018.

Onset of rainfall is predicted to start as early as late February in the South and late June in the extreme North. However, earlier than normal onset of rainfall are expected in Calabar, Eket, Ado-Ekiti, Akure, Lafía, Bauchi, Kaduna and Sokoto.

EXECUTIVE SUMMARY

Rainfall cessation dates are expected to be as early as September 28th over the northwest and progress southwards till December. A normal cessation is predicted for most parts of the country except for Jos, Ibi, and few places in the south where early cessation is likely. However, it is likely to be prolonged over Warri, Ondo, Ibadan and part of Lagos.

Forecast for length of growing season ranges from 117 days in the extreme North to 287 days in the Southern most parts. It is expected to be normal in most places and longer than normal over Ikom, Ibi, Abuja, Jos, Bida and Yelwa.

Normal rainfall amount is predicted for the country with the least amount expected to be in the range of 400 - 800mm over the North while the highest amount of 3000mm and above is likely to occur over the coastal areas. The predicted rainfall parameters are calculated to fall within a confidence interval of 65% which is higher than the mean climatology of 50%, and a tolerance margin of one standard error.

Day and night temperatures are predicted to be normal in 2018 over most parts of the country especially in February. However, above normal temperatures (i.e. warmer conditions) are most likely in about 80% of the northeast and some places in central and southern Nigeria including Lagos.

Below normal daytime temperature is predicted over the western half of the country and part of the central states in April, a period of peak temperatures. NiMet shall keep a close watch and monitor the progression of changes in these conditions on monthly basis and then provide all necessary updates.

The first part of this document is the evaluation of 2017 SRP followed by the presentation of the 2018 predicted temperatures and rainfall, and lastly the socio-economic implications of the forecast.

Senator Hadi A. Sirika

Hon. Minister of State (Aviation)
March, 2018

EVALUATION OF THE 2017 SEASONAL RAINFALL PREDICTION

The accuracy of the immediate past year's forecasts is usually evaluated in order to assess the performance of the model used as well as identify possible causes of low performance with a view to improving the model. In summary, 2017 evaluation result shows a better performance of the model in predicting rainfall than temperature. Temperature forecast showed lower performance skills of 30- 60% while rainfall onset, cessation, length of season and annual

rainfall amount showed better performances and high skill of approximately 70 - 80%.

TEMPERATURE EVALUATION

evaluation results of the Day and Night Temperature forecasts for January - April 2017 are presented below. Comments

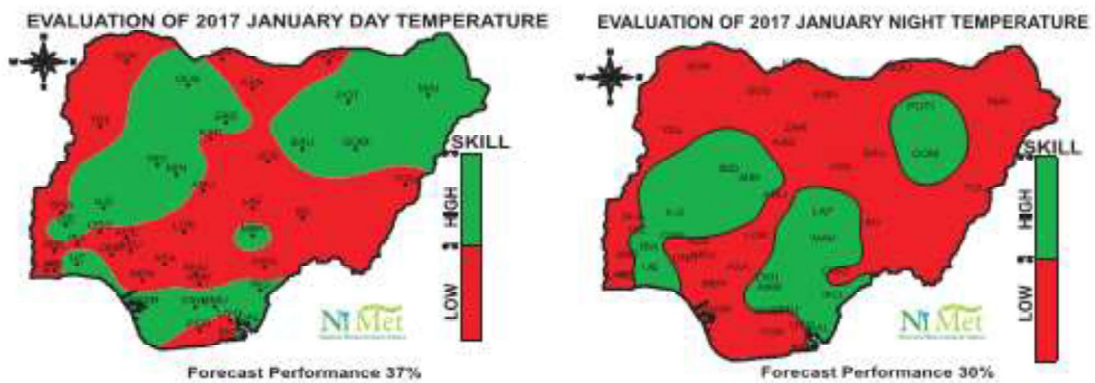


Figure 3a and 1b: Evaluation of January Day and Night Temperature

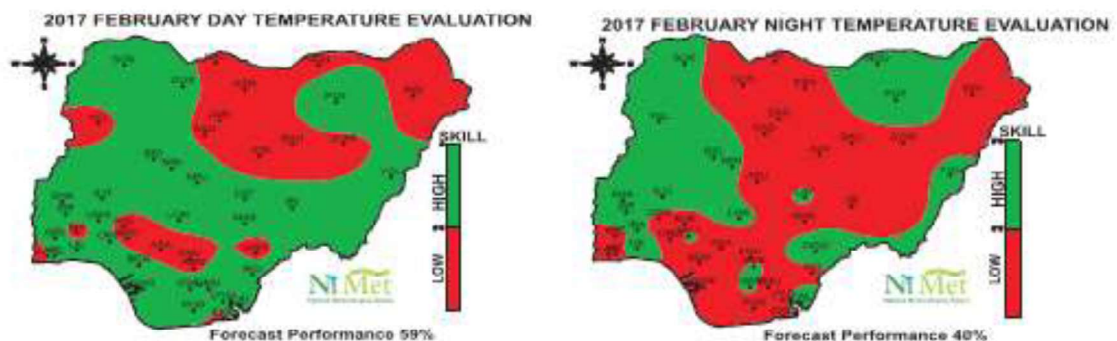


Figure 4a and 2b: Evaluation of February Day and Night Temperature

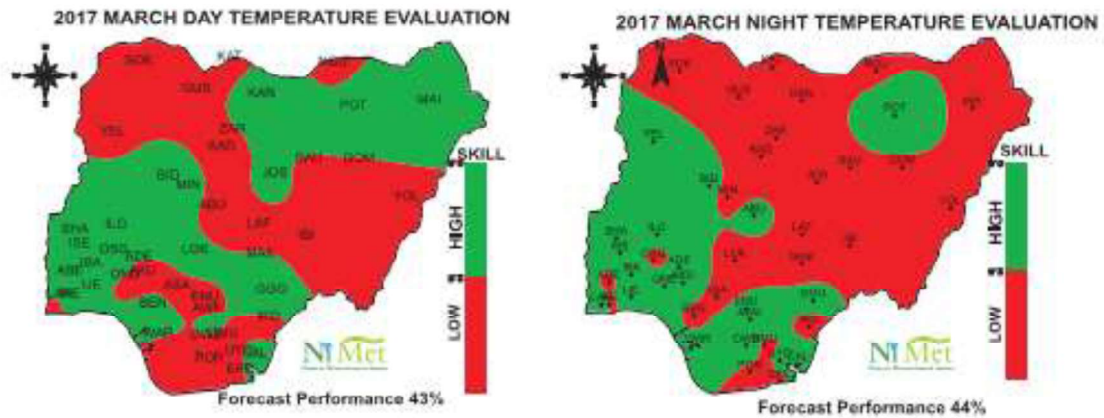


Figure a and 3b: Evaluation of March Day and Night Temperature

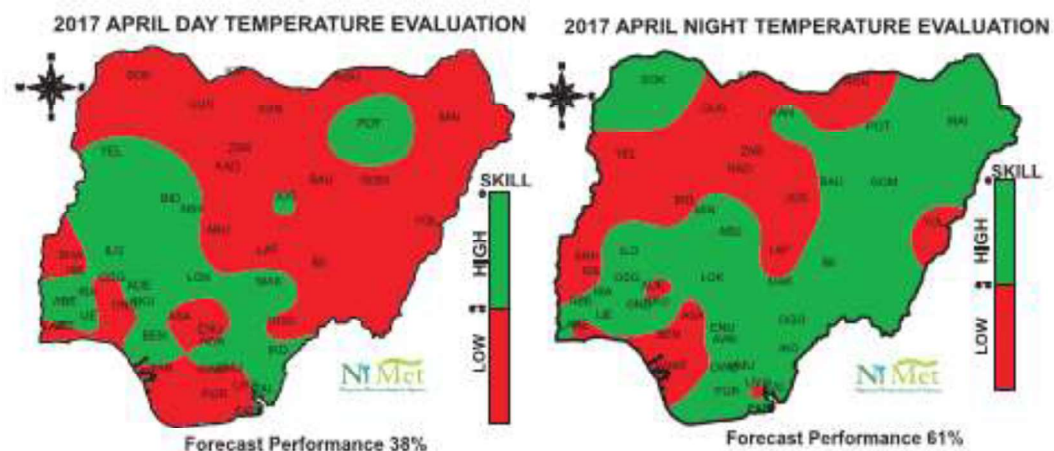


Figure 4a and 4b: Evaluation of April Day and Night Temperature

2017 was declared by WMO as the hottest Non - El Niño year in global history. It was characterized by severe weather extremes such as floods, hurricanes and heat waves. Locally, there were records of high temperatures in most parts of Northern Nigeria, this contributed to the Meningitis epidemic outbreak that led to the loss of lives of many Nigerians in March and April, 2017. (<https://public.wmo.int/en/media/press-release/2017-set-be-top-three-hottest-years-record-breaking-extreme-weather>)

The table below shows the summary of the 2017 Temperature Forecast Performance

PERFORMANCE OF 2017 TEMPERATURE FORECASTS

Met Parameter	Forecast Performance (%)
January Day Temperature	37
January Night Temperature	30
February Day Temperature	59
February Night Temperature	40
March Day Temperature	43
March Night Temperature	44
April Day Temperature	38
April Night Temperature	61

Inferences from the above table show that forecast performance was low. This means that temperatures in most cities were under predicted due to the departure of the year's temperatures from the average conditions that have been obtained in the areas over a long period of time in Non - El Niño years. More so, Carbon emissions for 2017 were recorded to

have increased at a rate beyond the immediate past three years; this contributed tremendously to the records of high temperatures in the areas. (<https://insideclimatenews.org/news/12112017/climate-change-carbon-co2-emissions-record-high-2017-cop23>)

EVALUATION OF 2017 RAINFALL FORECAST

The evaluation results for the 2017 Onset, Length and End of Growing Season as well as Annual Rainfall amount are presented below.

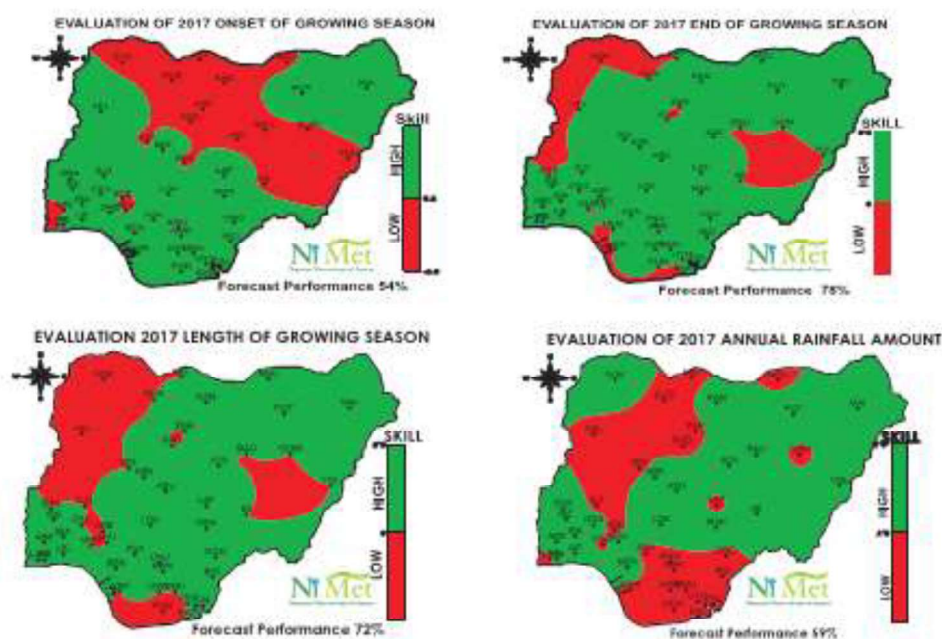


Figure 5a, 5b, 5c and 5d: Evaluation of the 2017 Onset, Cessation, Length of Season and rainfall amount

FORECAST PERFORMANCE SUMMARY

S/N	SITE	ACTUAL ANNUAL RAINFALL AMOUNT(MM)	PREDICTED ANNUAL RAINFALL AMOUNT (MM)	REMARKS
1	Akure	906	1403	Lower Than Predicted
2	Zaria	913	1050	
3	Gusau	969	865	Higher Than Predicted
4	Ondo	1818	1648	
5	Lagos Island	1894	1704	
6	Ilorin	1545	1240	
7	Yelwa	1322	1004	
8	Kaduna	1654	1287	
9	Nguru	951	443	
10	Lafia	1916	1262	

The rainfall amount recorded in 2017 was higher than the predicted amount in many parts of the country and lower in other parts. Places like Akure and Zaria recorded Rainfall amounts lower than predicted while Gusau, Ondo, Lagos Island, Ilorin and a few others experienced higher amounts than the predicted Rainfall amounts. There should be a statement here stating that the rest of the stations had the forecasts

correspond to the actual.

The general performance of the model in forecasting Rainfall for 2017 is summarized on the table below.

RAINFALL FORECAST PARAMETERS	PERFORMANCE (%)
ONSET OF GROWING SEASON	54
LENGTH OF SEASON	72
END OF GROWING SEASON	78
ANNUAL RAINFALL AMOUNT	59
AVERAGE PERFORMANCE	66

2018 SEASONAL RAINFALL PREDICTION

ENSO FORECAST

The SRP model makes use of the latest condition of El-Nino Southern Oscillation (ENSO), soil information, a crop model which incorporates farming practices, and historical daily weather data of minimum and maximum temperature, rainfall, solar radiation for a period of at least 30 years to produce the forecast.

The state of the Central Pacific Ocean defined by the phase of ENSO as at December 2017 was a weak La-Nina (Cold phase). This implies below normal sea surface temperature (SST). According to Australian Bureau of Meteorology, this condition is likely to persist till March 2018 after which it weakens (Fig. 6). Consensus ENSO forecast from the International Research Institute for Climate and Society

(IRI) and the Climate Prediction Centre (CPC), using 25 dynamic and statistical models comprising of over 500 ensemble forecasts, shows that the prevailing cooler than normal condition has a 64 - 76% chance of persisting till March 2018 after which a neutral ENSO phase is favored from April with a 61% probability, and likely to persist till August (Fig. 7). It is noteworthy to mention that the ENSO forecast for our region by IRI has been very reliable in the past years, particularly the last prediction of an ENSO neutral phase in 2017 which was actually observed as predicted.

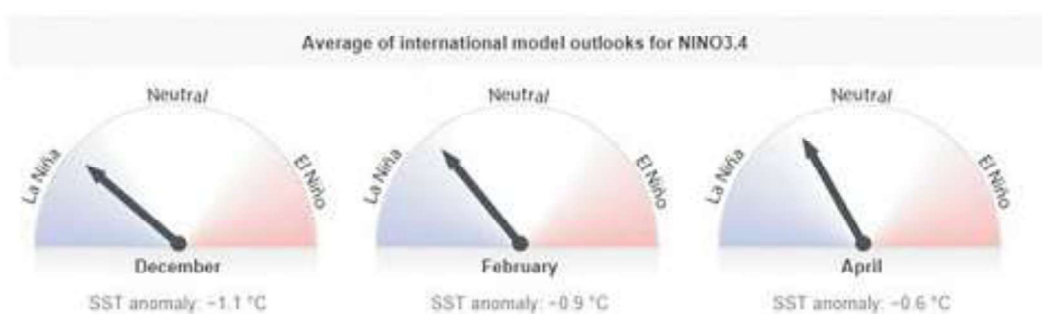
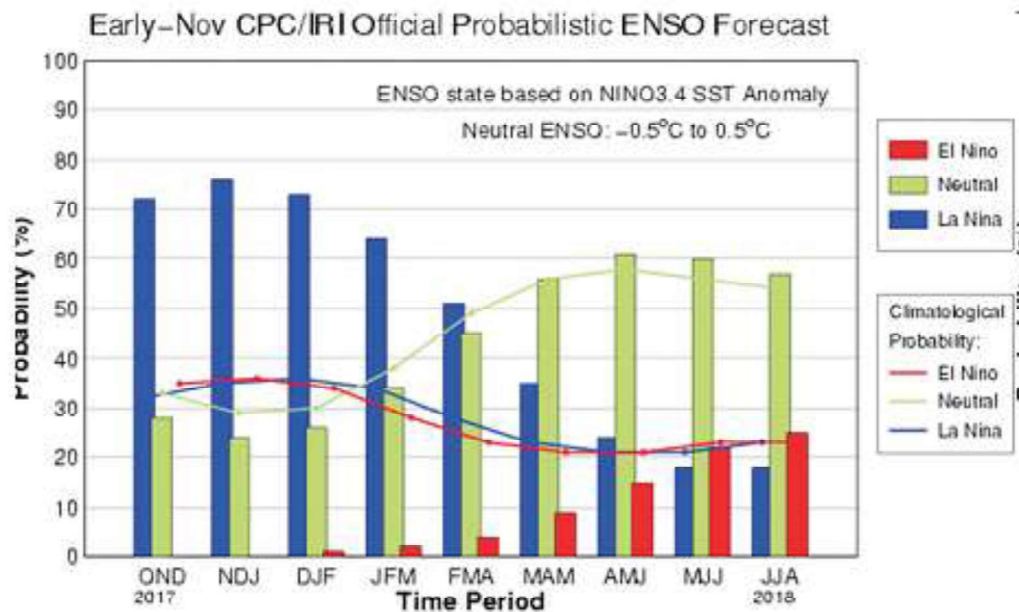


Figure 6 : Predicted ENSO phase from December 2017 to April 2018 (Source: Bureau of Australian Meteorology - <http://www.bom.gov.au/climate/enso>)

2018 SEASONAL RAINFALL PREDICTION (SRP)

In line with this, the 2018 SRP is based on two different phases of ENSO, starting with a La-Nina (cold) phase in the first quarter and a neutral phase in the second and third quarter. These phases are favorable for moderately high to normal rainfall in the country. NiMet shall continue to monitor

the update forecasts from these centres on monthly basis and provide all necessary updates.



2018 Day & Night Temperatures Forecast and Departure from Normal

Expected departures from long-term averages for the day and night-time temperatures for the four hot months – January, February, March and April – are presented. The temperature effects, during these months, are mostly felt in the country; i.e. the cold season dominates during the months of January and February while the hot season dominates during March and April. Greater parts of the country are expected to record

near average temperatures during these months. However, there will be some areas that will experience temperature anomalies that are about 2°C above normal (i.e. hotter than the average seasonal temperature).

January Day and Night Temperatures Prediction Deviations

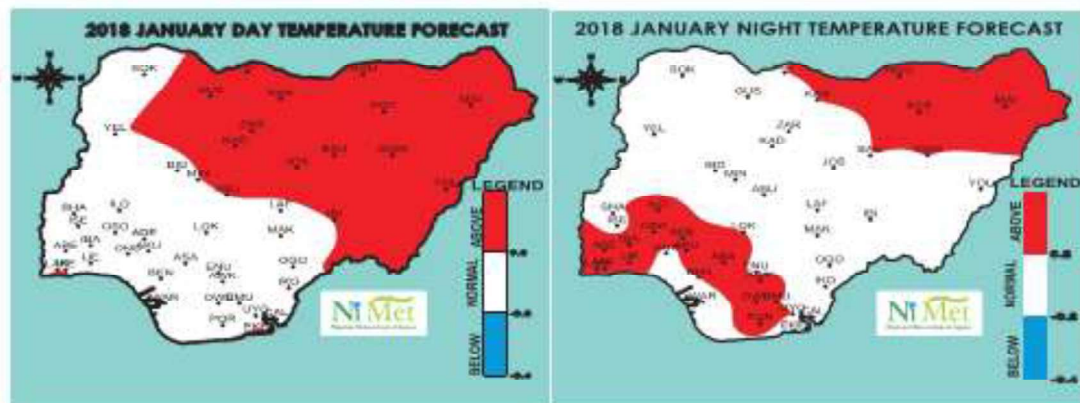


Figure 8a and 8b: Predicted Day and Night Temperatures for January 2018

Temperature prediction for January shows obvious warmer-than-normal temperatures conditions over places like Jos, Kaduna, Kano, Gusau, Bauchi, Gombe, Katsina, Maiduguri, Nguru, Potiskum, Ibi, Yola, Uyo, Lagos Island, Abuja, Minna, Yelwa and Sokoto during the daytime. Similarly, places like Nguru, Maiduguri, Ilorin, Oshogbo, Ondo, Ibadan, Ijebu-Ode, Lagos Island, Warri, Awka, Owerri and Port Harcourt are

expected to experience warmer-than-normal conditions during the night time. Expected temperature change over these places is about $+0.5^{\circ}\text{C}$. The temperatures over the rest of the country are however predicted to remain normal (Fig. 8).

2017 February Day and Night Temperature Prediction Deviations

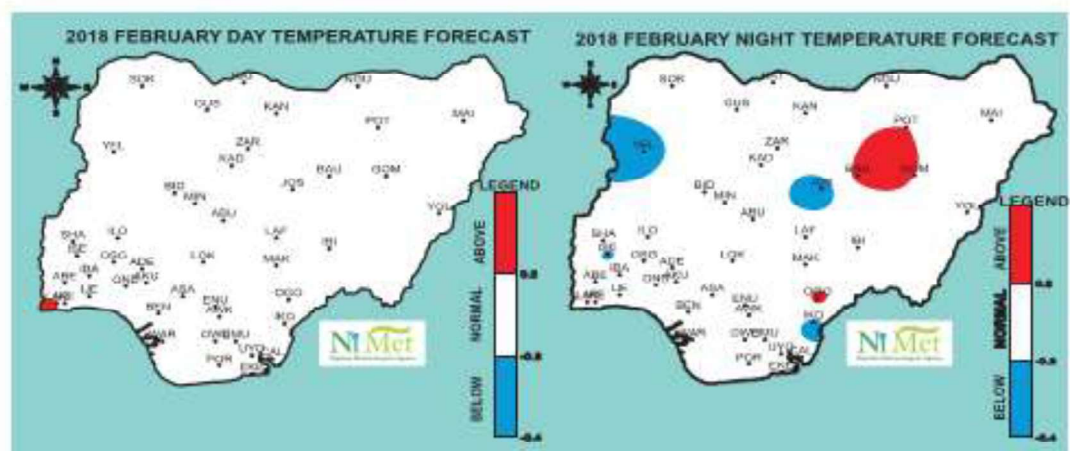


Figure 9a and 9b: Predicted Day and Night Temperature Deviations for February 2018

Temperatures over most parts of the country, in February 2018, are predicted to be normal except for Lagos Island where a warmer than normal situation is expected to be experienced during the day (Fig. 9 a). In Fig. 9 b, only few places like Yelwa, Jos, Ikom and Iseyin are likely

to experience cooler than normal temperatures while Bauchi, Gombe and Potiskum areas are predicted to experience warmer than normal night temperature conditions.

March 2018 Day and Night Temperatures Prediction Deviations

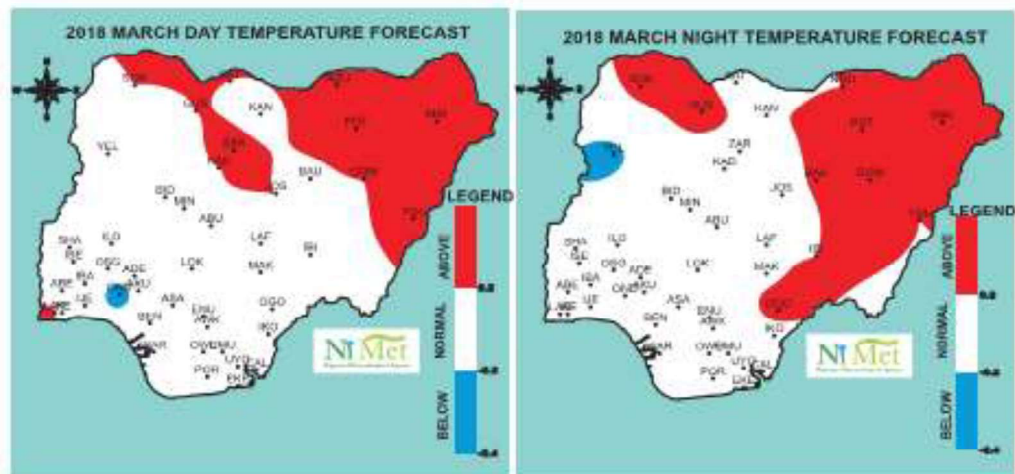


Figure 10a and 10b: Predicted Day and Night Temperatures for March 2018

In March 2018, normal temperatures are predicted for the southern and central parts of the country, while the north-eastern corners are expected to experience above-normal temperatures during the day (Fig. 10a). For the night temperature; the northeastern flank, extending to Ibi and Ogoja, also including

Sokoto and Gusau are likely to be warmer than normal. Yelwa is expected to be cooler than normal while other parts of the country are likely to be normal (Fig. 10b).

2018 April Day and Night Temperatures Prediction Deviations

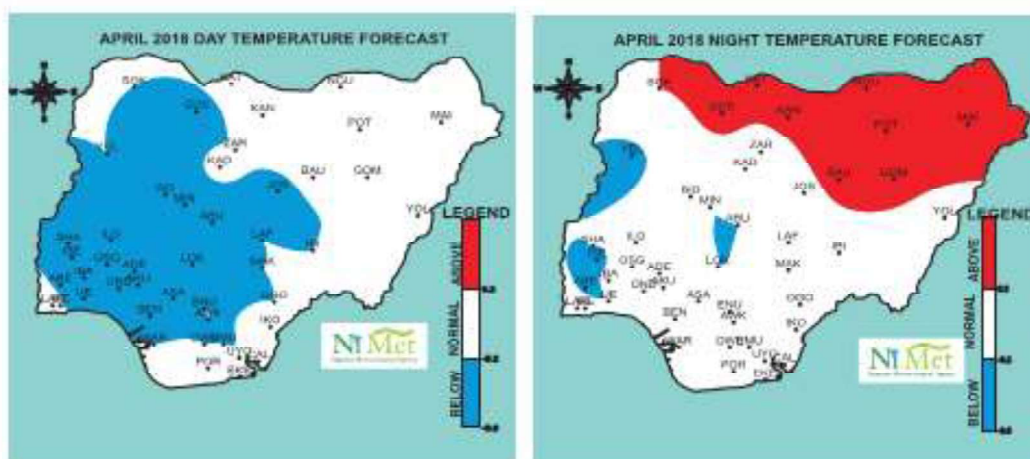


Figure 11a and 11b: Predicted Day and Night Temperatures for April 2018

Day time temperatures in April 2018 are expected to be cooler than normal over the central to the western part of the country. The rest of the country is likely to experience normal conditions (Fig. 11). Night time temperature is very likely to be warmer than normal in Bauchi, Gombe, Maiduguri, Potiskum, Nguru, Kano, Katsina and Gusau. This could bring with it high discomfort to the people. Cooler conditions will

however be experienced over Abuja, Lokoja, Yelwa, Shaki, Iseyin, Abeokuta and Ijebu Ode. The rest of the country is expected to observe normal temperature (Fig. 11).

2018 Rainfall Predictions

The 2018 rainfall season is expected to start by early March over the southern coastal cities and end in December over the coast. A normal length of season is expected with normal rainfall amounts. This should not present any major threat to agriculture. However, climate smart agriculture is

2018 Onset Dates of Growing Season and Departure from Normal

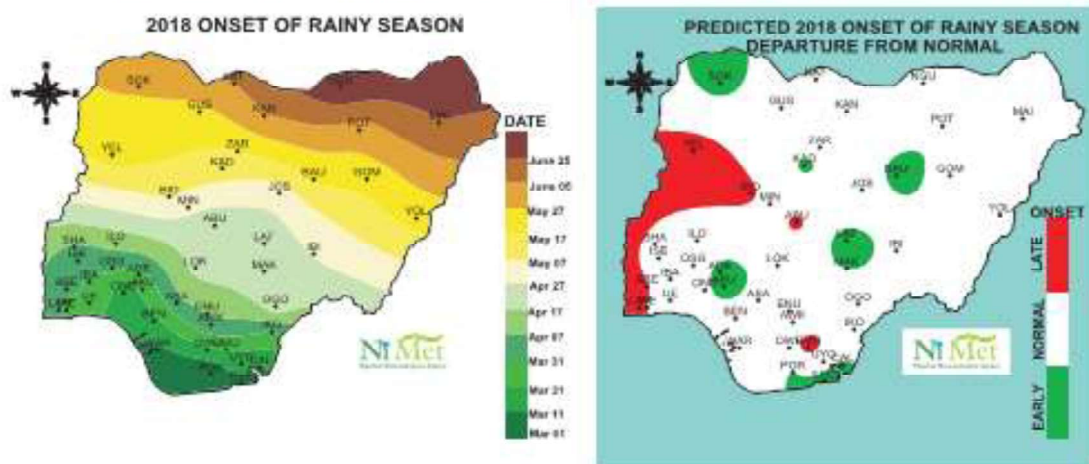


Figure 12a and 12b: Predicted onset dates of growing season and departure from Normal

The earliest onset date is expected to be from March 1st around the coastal region of the south-south (Fig. 12). The onset date changes as we move northwards with areas around Maiduguri, Potiskum and Nguru predicted to have onset from June 1st. The country is expected to experience normal-to-earlier-than-normal onset (Fig. 12). Places like Sokoto, Bauchi, Kaduna, Lafia, Makurdi, Ado-Ekiti, Akure, Calabar and Eket are expected to experience early onset while places like Yelwa, Bida, Abuja, Iseyin, Abeokuta, Lagos Island, Ikeja and Umuahia are likely to experience late onset. Other parts of the country are expected to have normal onset.

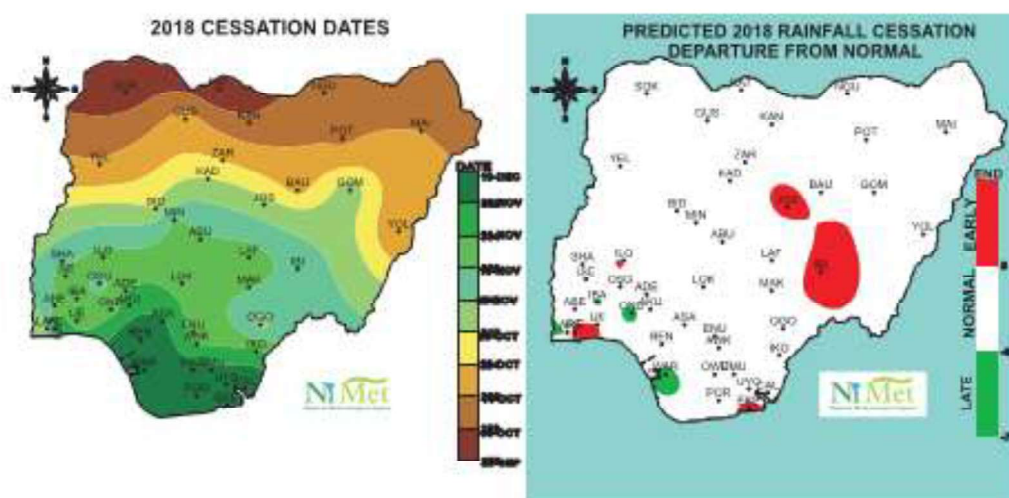


Fig. 13a and 13b 2018 Cessation Dates of Growing Season and Departure from Normal

2018 Cessation Dates of Growing Season and Departure from Normal

The end of 2018 growing season is expected to commence from September 28 (Fig. 13). The earliest cessation date is expected to start from September 28th. This will occur around Sokoto and Katsina. The southern coastal cities, with ample soil moisture, should have their cessation as late as December. Cessation of the growing season is expected to be normal across most parts of the country (Fig. 13). Early cessation is anticipated over Jos, Ibi, Uyo and Ikeja. Cessation will however be a little delayed over parts of Ibadan, Ondo and Warri.

2018 Predicted Length of Growing Season and Departure from Normal

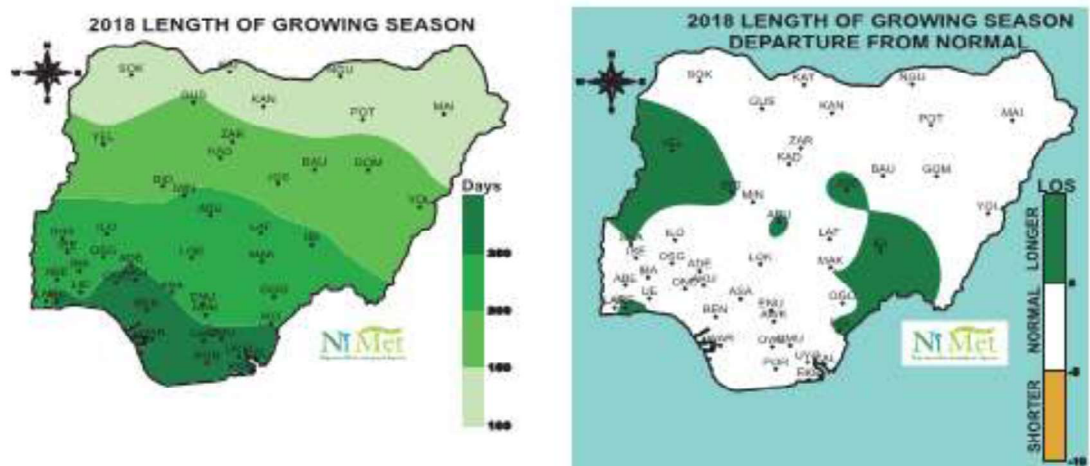


Figure 14a and 14b: Predicted length of growing season and departure from Normal

In 2018, the Length of Growing Season is expected to range from 117 to 287 days (Fig. 14), increasing from north to south. Normal length of growing season is predicted for most parts of the country (Fig. 14). However, cities such as Yelwa, Bida, Shaki, Ikeja, Abuja, Jos, Ibi, Makurdi, Ogoja and Ikomare expected to experience a longer than normal Length of Growing Season

2018 Predicted Annual Rainfall and Departure from Normal

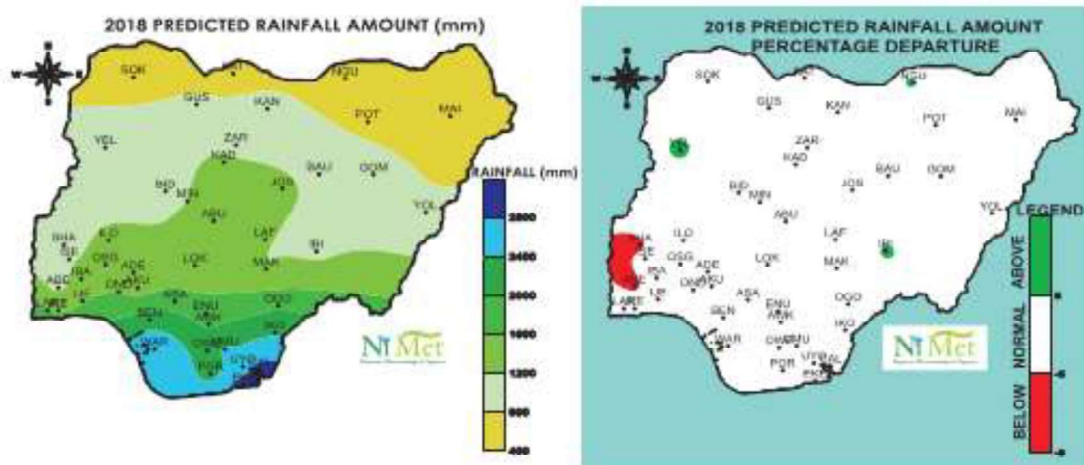


Figure 15a and 15b: Predicted annual rainfall and departure from Normal

The country is expected to have a normal rainfall season in most places. The least amounts of rainfall, within the range of 400-800mm, are expected across the extreme north such as Katsina, Nguru and Sokoto. Rainfall amount above 3100mm are likely in Eket and Calabar along the coast of the South East while Abuja, Gombe, Yelwa, Bida and places along the Rivers Niger and Benue are expected to have annual

rainfall amount in the range of 800-1600mm (Fig. 15). Most places are likely to have normal annual rainfall amount with exceptions to areas around Nguru, Yelwa, and Ibi where about 5-7% above normal rainfall are expected as denoted in green. Areas around Shaki and Abeokuta (highlighted in red) are likely to experience below normal annual rainfall amount (Fig. 15).

2018 Little Dry Season and Dry spell Prediction

2018 Little Dry Season

The little dry season (LDS) is a period earmarking the end of the first maxima and the beginning of the second maxima. It is characterized by consecutive days of little or no rainfall, at times lasting more than 7 days. Climatologically, this period coincides with either the month of July or August, in some cases both in parts. In most cases, it is prevalent in August hence the term "August Break". LDS is a phenomenon more pronounced in the south western part of

Nigeria where double maxima rainfall trends are attained. For this forecast, little or no rainfall is defined as any rainfall amount not exceeding or equal to one (RR $\leq$ 1mm).

The stations considered in this forecast are Abeokuta, Ado-Ekiti, Akure, Ibadan, Ijebu Ode, Ikeja, Ilorin, Iseyin, Lagos Roof, Osogbo, Shaki and Enugu. The probability of occurrence of LDS in 2018 is 40% in Iseyin and Enugu while about 60% chance of occurrence is predicted for Abeokuta, Ibadan and Shaki. Ikeja, Lagos Island (Roof),

Ilorin, Akure, Ado-Ekiti, Ilorin and Osogbo have chances of occurrence more than 75% in 2018. Averagely, LDS for 2018 is expected to start in the neighbourhood of 25th of July overlapping into the first dekad of August while early signs of LDS are expected 19th of July in Shaki. A maximum of about 23 consecutive days of little or no rainfall is

expected along the coast of Lagos in the month of August while about 20 days are expected in Ikeja and Ilorin. Other areas are expected to have mild to moderate effect of LDS as shown in Fig. 16 below.

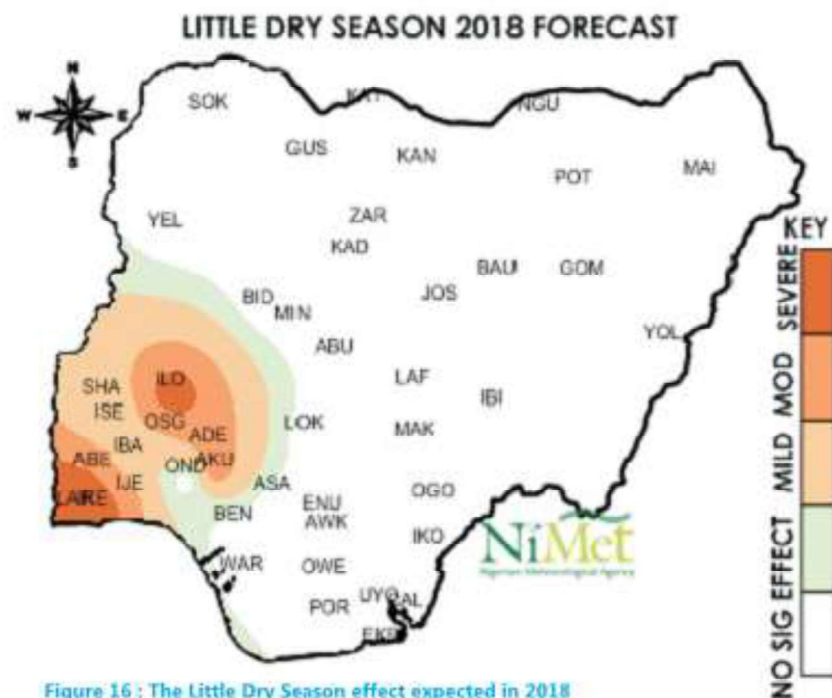
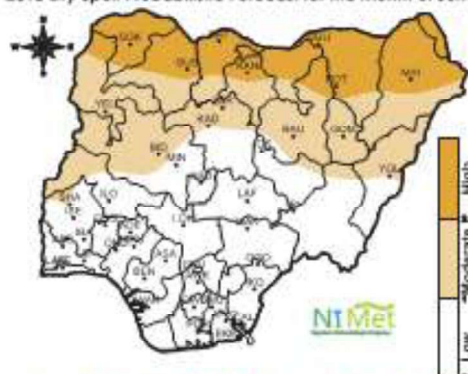


Figure 16 : The Little Dry Season effect expected in 2018

Dry spell Prediction

2018 Dry Spell Probabilistic Forecast for the Month of June



2018 Dry Spell Probabilistic Forecast for the Month of July

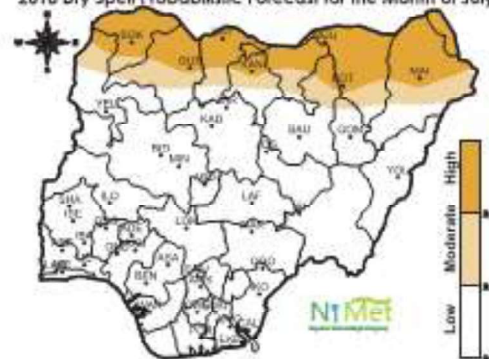


Figure 17a and 17b: Predicted areas of occurrence of dry spell in May and June respectively



Socio Economic Implications

Agriculture

Agriculture

Socio Economic Implications

The probabilistic dry spell forecast shows that northern parts areas like Sokoto, Zamfara, Katsina, Kano, Kebbi, Yobe and Borno are likely to experience severe dry spell in the month of June. This may last 10 to 18 days after the onset. Moderate dry spell that may last 7 to 16 days is expected around Yelwa, Shaki, Ilorin, Bida, Zaria, Funtua, Jos, Bauchi, Gombe and Yola in June, 2018.

The probability for dry spell in July is low. However, areas around Sokoto (Ilela, Gada, Tangaza, Isa, Gudu), Katsina (Jibia, Kaita,

Mai'Adua, Daura, Mashi, Dutsi), Yobe (Yusufari, Yunusari, Machina, Karasuwa), Jigawa (Birniwa, Guri, SuleTankarkar, Maigatari, Babura), Zanzara (Shinkafi, Zurmi, Maradun, Bakura, KauraNamoda), Kebbi (Augie, ArewaDandi, Argungu) and Borno (Mobbar, Abadam, Kukawa, Guzamala, Gubio, Nganzai, Mongono) will experience dry spell in the first week of July for 7 to 12 days spilling from the June dry spell

Crops

Farmers around Sokoto, Katsina, Yobe, Zanzara, Kebbi, Jigawa, Kano and Borno are advised to source for early maturing and drought resistant varieties of seed to avoid waste of resources (inputs, finances etc.)

Farmers around places like Yelwa, Bida and Abuja are advised not to plant early. This is because of the predicted late onset dates for the 2018

growing season over these areas. The potential moisture availability, during the onset period, will not be sufficient for plant growth and development. Similarly, early cessation in areas such as Jos, Ibi and Ilorin are likely to create water stress, therefore there is need to supplement with irrigation.

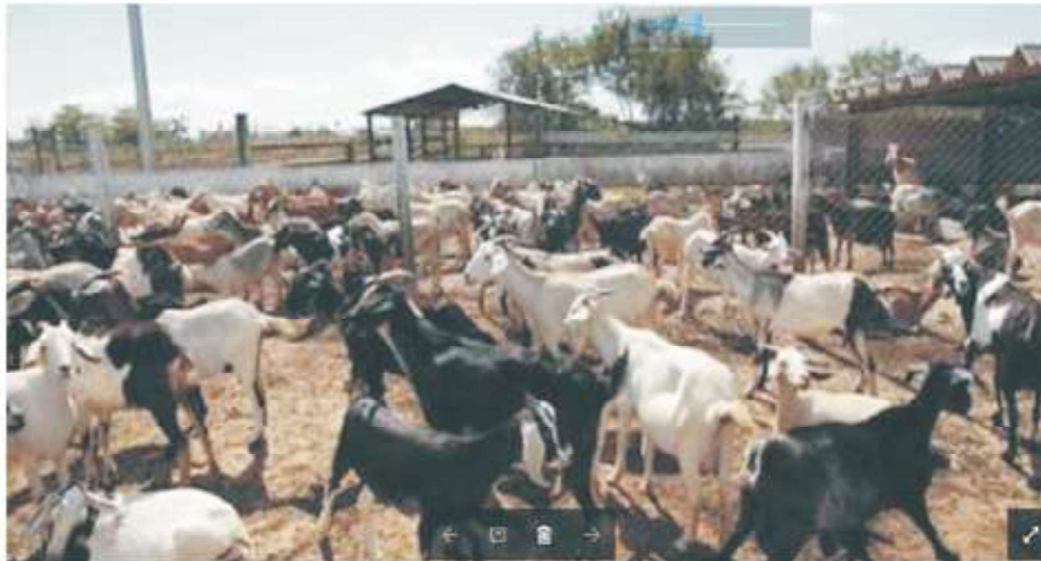


Climate Smart Agriculture (CSA) should be encouraged especially the Sudano-Sahelian zone of the country on the use of economic trees (Gum Arabic, Date palm, Shear, Jatropha etc.) for fencing, while zero tillage, mulching and other moisture conservation techniques are strongly advised.

Livestock

The warmer-than-normal temperatures predicted in March and April are expected to affect livestock production especially over the northwestern flank. This is expected to extend to some parts of northeast and north

central areas. Mortality rate is expected to increase during these months due to temperature fluctuations; day-old chicks may be most affected.



Spread of heat-related diseases is likely as a result of the predicted warmer conditions in most parts of the country. Therefore, necessary vaccines should be provided for animals. Fish production is likely to be adversely affected as a result of warmer-than-normal conditions especially in the northern part of the country. Aquaculture practitioners or operators should take note of areas predicted to have high run-offs in order to avoid associated impacts.

Water Resources Management

The annual rainfall forecast for 2018 ranges between 400mm-3100mm over the country. This will impact positively on the amount of water available for agriculture, energy production, navigation, recreation, and manufacturing purposes across the country. Available water, over few parts of the

country like Nguru, Yelwa, and Ibi where rainfall forecast is expected to exceed the normal by about 5-7%, may aggravate high flow of surface waters (rivers and streams) as well as positive groundwater recharge. These may lead to intermittent Flash Floods, soil erosions and moderate damage to ecosystem.

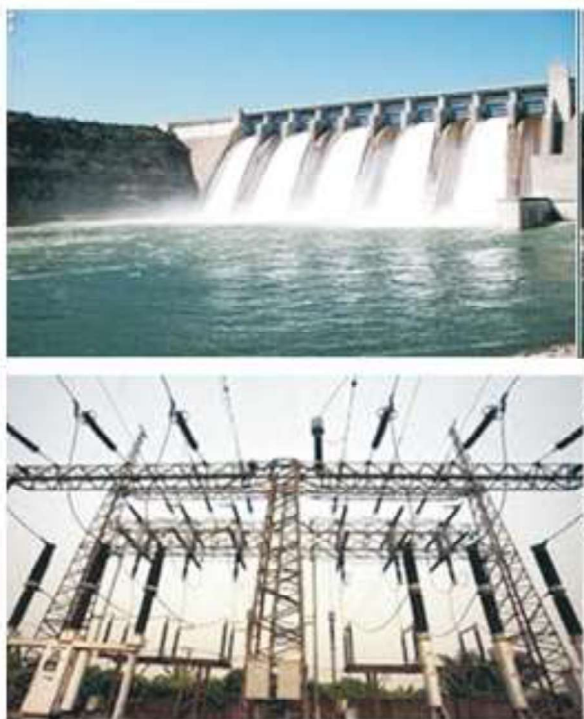
However, the highlights over places like Shaki and Abeokuta where below normal annual rainfall situation is most likely to occur will have the negative impact on water availability for various water related sectors of the economy. Expectedly, hydrologists, water resources managers as well as other relevant stakeholders are therefore, advised to pay attention to the advisories contained in the SRP as well as other advisories like the Monthly Drought and Flood Monitoring Bulletin in their operational activities.

Power generation and distribution

Hydroelectric power generation is usually affected by the shortage and/or surplus of rainfall. As rainfall in 2018 is expected to be normal in most parts of the country, especially in the areas where the hydroelectric dams exist such as Kainji, Jebba, Shiroro and Ikere Gorge, power generation and distribution is not likely to be much affected by rainfall in 2018. It is noteworthy though, that heavy rainfall accompanied by strong winds are prevalent during the onset period of rainy season and this

may affect electricity distribution as transmission poles may be uprooted in some places.

Also, the potentials for renewable power generation like Solar and Wind are higher in places with clearer skies and stronger winds especially in the extreme northern cities. Therefore, investors in renewable energy are advised to take advantage of these potentials before the onset of the rainy season.



TRANSPORTATION

Road Transportation

Road users are advised to drive carefully during the onset (between March and June) and cessation of rainfall (between September and December), and during harmattan periods. The onset and cessations of rainfall are usually characterized by strong winds which are capable of pulling down trees that could constitute obstructions on the roads. Flooding and submerging of roads more

likely between July and September over Yelwa, Bida, Nguru, Abuja and Jos where above normal rainfall and longer than normal season is expected.

Above normal temperatures in March over the North east is also likely to cause vehicle tire burst during the day. Caution should be the watchword at a time like this; strict adherence to speed limit to avoid running into obstructions is very imperative.

Transportation

As usual, fog and haze may also inhibit horizontal visibility in 2018. This is expected to result in flight disruptions, with its attendant loss in revenue due to delays and cancellations of flight. It will also constitute hazards to road transportation, whose operators are advised to use fog lights and also obey the lay down speed limits.

Road Transportation

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Rail Transportation

The Rail lines generally have the tendency to expand during the warm period and contract during the cooler period due to linear expansivity of metals, but in 2018 there is no sharp contrast between daytime and nighttime temperatures during the hot season in March and April that will cause significant expansion and contraction of the rail lines. However, caution should be

employed to maintain adequate speed regulation to avoid derailment. During Harmattan period, the use of fog lights is advised to reduce accident on the rail paths.



Marine Transportation

Operators in the maritime industry will experience boost in 2018 due to the normal to above normal rainfall predicted for most parts of the country. Coastal fishing and boat recreation will equally experience a boost. Consequently, activities of coastal marine transporters, shipping, as well as oil & gas operations could expect more disruption by storms and tidal waves during onset, cessation and the peak of rainfall. Boats and Canoes are to be well secured to avoid wreckage from strong winds, storm

surges and positive ocean tides during onset in March and during the season between March and December

Marine fog causes poor visibility over the high sea leading to disruptions in maritime transport activities. Operators are therefore warned to take adequate precautions to avoid accident particularly during the rainfall cessation period when this is common.



Air Transport

The onset and cessation of rainfall are the most challenging time for airliners; strong winds that are normally associated with these periods with high intensity of rainfall call for caution in the airline industry. Harmattan period is another challenging time where visibility could be reduced to less than Station Minima thereby

causing flight delays and cancellations. Caution should be exercised to receive clearance from NiMet, through the Air Traffic Controller (ATC) before take-off / landing. At a time like this safety should be the watchword.



Health

From January to April, both day and night temperatures are predicted to be warmer than normal in parts of the northeast, extending towards the northwest and parts of the southwest. These areas cover most of the Meningitis belt in Nigeria. Cerebrospinal Meningitis (CSM) and other heat related diseases such as Heat rashes, dehydration and airborne disease outbreaks such as measles chicken pox, avian influenza and general human discomfort are likely during these period. Health worker are advised to make adequate preparation to contain any outbreak. This period also coincides with peak of the dry season, when there is shortage of drinking water and thus the likely hood of consuming contaminated water that may result in diseases such as typhoid fever is high. State and Local government authorities are hereby advised to sensitize their communities on the need to drink from clean and hygienic sources during these periods. Other precautionary measures may include general increase in water intake, avoid overcrowding, avoid moving around during the peak of the hot temperatures during the day, vaccination against preventable diseases, health worker are advice to improve surveillance to detect cases of disease outbreaks early.

Onset could be associated with vector borne diseases such as Malaria and Dengue and also water borne diseases such as Cholera, Diarrheal diseases and typhoid enteritis.

The Mitigating Measures include the following:

- ⊗ The populace should improve their drainage system to avoid breeding of mosquitoes
- ⊗ Ensure they sleep under Long lasting Insecticidal Nets (LLINs)
- ⊗ Proper closure of doors and windows in the evening
- ⊗ Protect/Improve water supplies by providing potable water
- ⊗ Encourage boiling of water before drinking
- ⊗ Health education on sanitation and water source protection Health

From January to April, both day and night temperatures are predicted to be warmer than normal in parts of the northeast, extending towards the northwest and parts of the southwest. These areas cover most of the Meningitis belt in Nigeria. Cerebrospinal Meningitis (CSM) and other heat related diseases such as Heat rashes and general human discomfort are likely during these period. Health worker are advised to make adequate preparation to contain any outbreak. This period also coincides with peak of the dry season, when there is shortage of drinking water and thus the likely hood of consuming contaminated water that may result in diseases such as typhoid fever is high. State and Local government authorities are hereby advised to sensitize their communities on the need to drink from clean and hygienic sources. during these periods.

Disaster Management

As this year's forecast is projecting a normal to above-normal rainfall across the country, emergency managers should use this information to help prepare disaster prone communities for the aftermath of excessive rainfall that may likely cause flooding. Also, wet spells and flash flood can occur in areas with likelihood of normal to below-normal rainfall. Other disasters may arise from possible strong and gusty winds and lightening especially at the onset and

cessation periods of the rains. The southernmost areas will be characterized with more violent thunderstorm during these two periods.

The general public is advised to clean up their drainage channels to allow free passage of water so as to reduce the risk of flooding in their communities.





Telecommunications

Telecommunication sector in Nigeria majorly operates at long wavelengths and low frequencies within the microwave and radio bandwidths which are usually affected by rainfall leading to poor terrestrial reception of signals.

Heavy rainfall during the peak of the season also causes flooding which affects these installations and disrupts the ability to communicate or access information, thus negatively affecting human lives, business and return on investment.



Underground and above-ground installations such as towers/Masts, antennae, switch boxes, ground base transmitting/exchange stations and data centers, trunk routes, wires and cables, are expected to be affected by strong winds and thunderstorm activities which usually accompany onset and cessation of rainfall in the country particularly in the North. However, gusty winds of over 40 Knots (20m/s) common during rainfall onset in March over the south and June-July in the Northern part of the country are likely to pull down installations such as masts and antennae with weak foundations. It is therefore advised that service providers in this sector should assess all existing installations before rainfall onset, and ensure that the foundations of such structures are strengthened and are able to withstand strong windstorm.

The predicted normal rainfall across most parts of the country is not likely to pose serious threats

to telecom installations. Interference of signals by rainfall and risk of destruction of transmitters by thunderstorm is expected to be minimal during the season except during the peak period in August in the North and in July and September over the Southern part of the country when the risk is high. Risk of signal attenuation by rain and submerging of ground based exchange stations and trunk routes is also likely to be high over Ibi, Yelwa and Nguru where above-normal rainfall is predicted. Effort should therefore be made to boost signal quality and reception during this period.

The high night and day temperatures predicted for the month of March in the North pose no threat to telecommunication since the sector makes use of the Microwave and radio bandwidth, and not the infrared bandwidth that can be affected by heat or high temperature.

2018 Temperature Prediction Tables

Table6 : A Detailed Station by Station Predicted Day time Temperatures

Station	Long	Lat	Jan	Feb	Mar	Apr
ABEOKUTA	3.33	7.2	34.9	36.2	35.6	34.1
ADO EKITI	5.2	7.6	32.9	34.4	33.8	32.2
ABUJA	7.2	9	35	36.7	37	35
AKURE	5.3	7.2	33	34.4	33.9	32.3
ASABA	6.23	6.82	33.9	35.2	35.1	33.7
AWKA	7.07	6.2	33.9	35.2	35.1	33.6
BAUCHI	9.82	10.28	31.1	33.8	37	37.8
BENIN	5.6	6.33	33.3	34.4	34.1	33
BIDA	6	9.8	35.1	37.3	38	36.4
CALABAR	8.35	4.97	32.2	33.4	32.6	31.9
EKET	7.95	4.4	31.5	32.5	31.9	31.6
ENUGU	7	6.5	33.9	35	35	33.4
GOMBE	11.17	10.27	31.2	33.9	37.2	37.8
GUSAU	6.77	12.17	31.8	34.5	38	38.6
IBADAN	3.9	7.43	33.4	35	34.5	33
IBI	9.75	8.18	34.9	37.2	38.3	36.4
IJEBU	3.93	6.83	33.1	34.3	34	32.7
IKEJA	3.33	6.58	33	33.6	33.4	32.7
IKOM	8.72	5.97	33	34.9	34.5	33.2
ILORIN	4.58	8.48	33.9	35.6	35.8	33.9
ISEYIN	3.6	7.97	34	35.1	34.8	32.8
JOS	8.9	9.87	28.3	29.9	31.6	30.5
KADUNA	7.45	10.6	31.6	33.9	36.1	35.6
KANO	8.53	12.05	29.5	32.9	36.7	39.1
KATSINA	7.68	13.02	29.6	32.5	36.7	38.9
LAFIA	8.47	8.5	35.4	37.3	37.9	35.7
LAGOS ISLAND	3.06	6.58	31.1	32	32.3	31.5
LOKOJA	6.73	7.8	35	37.1	37.5	35.4
MAIDUGURI	13.08	11.85	31.6	34.6	38.7	41
MAKURDI	8.5	7.7	35.2	37	37.5	35.4
MINNA	6.54	9.54	35	37.1	38.1	36.3
NGURU	10.47	12.88	30.5	33.9	38	40.5
OGOJA	8.8	6.7	34.7	36.2	36.1	34.4
ONDO	4.83	7.1	32.7	34.1	33.2	31.7
OSHOGBO	4.5	7.82	33.3	35	34.4	32.5
OWERRI	7.03	5.48	33.6	34.7	34	33.1
PORT HARCOURT	7.12	4.85	32.9	33.8	33	32.5
POTIKUM	11.03	11.7	31	33.9	38.1	40.1
SHAKI	3.47	8.35	33.5	35.1	34.9	32.8
SOKOTO	5.2	12.92	32.4	35.2	39	40.5
UMUAHIA	7.48	5.52	33.2	34.4	34.1	33
UYO	7.92	5.05	32.8	34.3	33.3	32.4
WARRI	5.73	5.52	32.8	33.7	33.6	33
YELWA	4.5	11	35	37.2	39.2	38.4
YOLA	12.47	9.23	34.7	37.4	40.2	39.5
ZARIA	7.75	11.07	30.1	32.8	36	36.2

A Detailed Station by Station Predicted Night time Temperatures

Station	Long	Lat	Jan	Feb	Mar	Apr
ABEOKUTA	3.33	7.2	22.7	24.3	24.9	24.6
ADO EKITI	5.2	7.6	19.5	21.5	22.8	22.5
ABUJA	7.2	9	18.2	21.3	23.7	23.9
AKURE	5.3	7.2	19.6	21.6	22.9	22.6
ASABA	6.23	6.82	22.5	24.1	24.7	24.3
AWKA	7.07	6.2	22.4	24.3	24.8	24.2
BAUCHI	9.82	10.28	14.1	17.1	21.3	24.2
BENIN	5.6	6.33	23	24.2	24.5	24
BIDA	6	9.8	21.3	24.2	26.3	25.9
CALABAR	8.35	4.97	22.9	23.9	24	23.7
EKET	7.95	4.4	22.6	23.6	24	24
ENUGU	7	6.5	21	23.2	24.4	23.8
GOMBE	11.17	10.27	15.2	18.2	22.3	24.5
GUSAU	6.77	12.17	15.2	18	21.9	24.7
IBADAN	3.9	7.43	22.5	23.7	23.9	23.5
IBI	9.75	8.18	18.6	22.1	25.2	25.4
IJEBU	3.93	6.83	22.7	23.8	24.2	23.9
IKEJA	3.33	6.58	23.5	24.6	25	24.7
IKOM	8.72	5.97	20.4	22.2	23.5	23.2
ILORIN	4.58	8.48	19.9	22.3	23.6	23.4
ISEYIN	3.6	7.97	20.9	22	23.1	22.8
JOS	8.9	9.87	12	14	17	18.4
KADUNA	7.45	10.6	15.4	18	21	23
KANO	8.53	12.05	13.5	16.5	20.9	24.7
KATSINA	7.68	13.02	13.2	15.7	20.1	24.1
LAFIA	8.47	8.5	18.9	22.5	25.6	25.5
LAGOS ISLAND	3.06	6.58	24.8	25.7	26.2	25.8
LOKOJA	6.73	7.8	20.3	23.8	25.8	25.3
MAIDUGURI	13.08	11.85	13.1	15.8	20.6	25
MAKURDI	8.5	7.7	18.7	22.3	25.4	25
MINNA	6.54	9.54	20.3	23.1	24.9	24.8
NGURU	10.47	12.88	14.1	16.5	20.7	24.1
OGOJA	8.8	6.7	20.5	22.8	24.3	24
ONDO	4.83	7.1	22	23.2	23.5	23.1
OSHOGBO	4.5	7.82	19.5	21.6	23	22.9
OWERRI	7.03	5.48	22.4	23.7	24.1	23.9
PORT HARCOURT	7.12	4.85	21.6	22.9	23.4	23.4
POTIKUM	11.03	11.7	13.1	16	20.5	24.4
SHAKI	3.47	8.35	20	21.7	22.9	22.5
SOKOTO	5.2	12.92	16.7	19.5	23.7	26.9
UMUAHIA	7.48	5.52	22.4	23.8	24.3	23.9
UYO	7.92	5.05	22.2	23.5	24	23.8
WARRI	5.73	5.52	23.1	24.2	24.6	24.3
YELWA	4.5	11	15.9	19	23.6	26.1
YOLA	12.47	9.23	17.6	20.8	24.9	27
ZARIA	7.75	11.07	14.3	17	20.9	23

2018 Rainfall Prediction Tables

Detailed station by station likely onset and cessation dates, length of rainy season and seasonal amount of rainfall with their marginal errors.

Station	Onset		End Of Season		Length of Season		Seasonal Rainfall	
	Likely	ME Days	Likely	ME Days	Likely	ME Days	Likely	ME mm
ABEOKUTA	31-Mar	3	22-Nov	7	236	8	1120	79
ADOEKITI	23-Mar	2	30-Nov	6	252	7	1409	75
ABUJA	28-Apr	3	23-Nov	3	209	5	1481	77
AKURE	21-Mar	2	3-Dec	4	257	5	1383	72
ASABA	5-Apr	3	9-Dec	4	248	5	1871	93
AWKA	5-Apr	3	30-Nov	5	239	6	1935	120
BAUGHI	19-May	2	29-Oct	4	163	6	1111	83
BENINI	15-Mar	2	19-Dec	4	279	5	2206	108
BIDA	8-May	2	6-Nov	2	182	3	1088	49
CALABAR	6-Mar	4	18-Dec	6	287	7	2987	118
EKET	5-Mar	7	17-Dec	10	287	12	3076	350
ENUGU	7-Apr	3	27-Nov	4	234	4	1834	58
GOM	26-May	3	10-Nov	2	168	3	998	33
GUSAU	1-Jun	3	27-Oct	3	148	4	891	56
IBADAN	27-Mar	2	26-Nov	11	244	11	1328	88
IBI	27-Apr	3	21-Nov	2	208	3	1107	58
IJEBU-ODE	28-Mar	3	24-Nov	6	241	5	1594	69
IKEJA	18-Mar	3	15-Dec	3	272	5	1520	72
IKOM	26-Mar	7	2-Dec	5	251	6	2352	68
ILORIN	19-Apr	3	26-Nov	4	221	4	1287	87
ISEYIN	30-Mar	3	27-Nov	4	242	6	1171	68
JOS	9-May	2	9-Nov	3	184	3	1268	34
KADUNA	16-May	1	6-Nov	3	174	4	1309	52
KANO	5-Jun	4	17-Oct	3	134	5	1000	97
KATSINA	11-Jun	5	7-Oct	6	118	7	559	45
LAFIA	20-Apr	4	10-Nov	11	204	11	1228	88
LAGOS KOOF	5-Apr	7	26-Nov	10	235	10	1687	86
LOKOJA	20-Apr	4	27-Nov	2	221	3	1229	54
MAIDUGURI	19-Jun	2	23-Oct	3	126	4	562	50
MAKURDI	20-Apr	4	23-Nov	3	217	4	1210	52
MINNA	30-Apr	3	23-Nov	2	207	3	1196	47
NGURU	29-Jun	2	20-Oct	3	113	5	467	43
OGOJA	23-Apr	2	11-Nov	1	202	2	1965	151
ONDO	11-Mar	3	27-Nov	13	261	13	1599	102
OSOGBO	1-Apr	2	19-Nov	5	232	5	1309	52
OWERRI	14-Mar	4	11-Dec	3	272	6	2310	85
PORT-HACOURT	1-Mar	4	14-Dec	5	288	6	2251	54
POTISKUM	1-Jun	4	21-Oct	2	142	5	671	40
SHAKI	5-Apr	4	20-Nov	5	229	6	1083	56
SOKOTO	4-Jun	4	10-Oct	3	128	5	626	28
UMUAHIA	20-Mar	5	10-Dec	5	265	9	2439	203
UYO	13-Mar	5	14-Dec	5	276	7	2487	303
WARRI	6-Mar	4	17-Dec	5	286	6	2763	69
YELWA	22-May	4	24-Oct	3	155	4	1015	50
YOLA	25-May	2	23-Oct	2	151	3	858	
ZARIA	21-May	2	31-Oct	4	163	4	1050	48

Detailed city-by-city predicted

2018 SEASONAL RAINFALL PREDICTION (SRP)

Detailed city-by-city predicted Onset and Cessation dates of Growing Season, Length of season and Seasonal Rainfall Amount.

State	City	Long	Lat	Onset date	Season end	Season Length Days	Annual Rainfall mm
ABIA	Aba	07.35	05.10	9-Mar	14-Dec	281	2533
	Bende	07.63	05.55	14-Mar	10-Dec	272	2312
	Uzoakali	07.56	05.63	15-Mar	9-Dec	271	2274
	Ukwa West	07.23	04.97	7-Mar	15-Dec	284	2599
	Lekwesi	07.45	05.97	19-Mar	7-Dec	264	2118
	Ighere	07.65	05.71	16-Mar	9-Dec	269	2237
	Isiukwuato	07.46	05.76	17-Mar	8-Dec	268	2213
	Isiama	7.81	5.68	16-Mar	9-Dec	270	2250
	Nguzu-Edda	7.82	5.77	17-Mar	8-Dec	268	2209
	Ikwanano	7.81	6.03	20-Mar	6-Dec	263	2092
	OsisiomaNgwa	7.33	5.15	9-Mar	13-Dec	280	2507
	Mbosi	7.43	5.38	12-Mar	11-Dec	276	2393
	Akwete	7.35	4.88	6-Mar	15-Dec	286	2646
	Abiriba	07.73	05.70	16-Mar	9-Dec	269	2241
	Arondizuogu	07.10	05.85	18-Mar	8-Dec	266	2172
	Umuahia	07.48	05.52	20-Mar	10-Dec	265	2439
ADAMAWA	Mayo Belwa	12.03	09.03	25-Apr	13-Nov	204	1097
	Hong	12.55	10.14	9-May	4-Nov	182	894
	Girci	12.33	09.22	28-Apr	11-Nov	200	1056
	Yola	12.47	09.23	25-May	23-Oct	151	858
	Lamurde	11.47	09.60	2-May	8-Nov	192	982
	Mubi	13.25	10.27	11-May	3-Nov	179	876
	Jada	12.1	8.72	22-Apr	15-Nov	210	1170
	Gombi	12.43	10.09	8-May	5-Nov	183	902
	Furfore	12.34	9.13	27-Apr	12-Nov	202	1075
	Song	12.62	9.82	5-May	7-Nov	188	944
	Shelleng	12.00	09.89	6-May	6-Nov	187	932
	Toungo	12.05	08.12	14-Apr	20-Nov	222	1330
	Maiha	13.21	09.98	7-May	6-Nov	185	918
	Guyuk	11.93	09.91	6-May	6-Nov	186	929
	Michika	13.23	10.37	12-May	3-Nov	177	864
	Madagali	13.63	10.88	18-May	30-Oct	167	809
AKWA IBOM	Eket	07.95	04.40	5-Mar	17-Dec	287	3076
	Abak	07.47	04.59	2-Mar	17-Dec	291	2801
	Etinan	07.86	04.85	6-Mar	15-Dec	286	2662
	Ikot-Abasi	07.34	04.34	28-Feb	19-Dec	296	2940
	Ibeto	07.58	04.33	28-Feb	19-Dec	296	2945

2018 SEASONAL RAINFALL PREDICTION (SRP)

	Essien-Udim	07.45	05.05	8-Mar	14-Dec	282	2558
	Nsit-Ubium	07.40	05.08	8-Mar	14-Dec	282	2543
	Onna	07.43	05.11	9-Mar	13-Dec	281	2528
	Mkpat-Enin	07.46	04.42	29-Feb	19-Dec	295	2895
	Oron	08.14	04.50	1-Mar	18-Dec	293	2850
	IkotEkpene	07.43	05.11	9-Mar	13-Dec	281	2528
	Uyo	07.92	05.05	13-Mar	14-Dec	276	2487
ANAMBRA	Ihiala	6.86	5.85	18-Mar	8-Dec	266	2172
	Agulu	7.06	6.11	21-Mar	6-Dec	261	2057
	Nnewi	06.92	06.02	20-Mar	6-Dec	263	2096
	Ozubulu	06.85	05.95	19-Mar	7-Dec	264	2127
	Okija	06.84	05.91	18-Mar	7-Dec	265	2145
	Omor	06.96	06.51	26-Mar	3-Dec	253	1889
	Mgbakwu	07.05	06.27	23-Mar	4-Dec	258	1988
	Umunze	07.23	05.96	19-Mar	7-Dec	264	2123
	Nzam	06.72	06.45	25-Mar	3-Dec	255	1913
	Umuchu	7.06	6.2	22-Mar	5-Dec	259	2018
	Aguleri	6.88	6.33	24-Mar	4-Dec	257	1963
	Otuocha	6.85	6.34	24-Mar	4-Dec	257	1959
	Ogidi	6.89	6.14	21-Mar	5-Dec	261	2044
	Onitsha	6.78	6.15	21-Mar	5-Dec	260	2040
	Awka	06.20	07.07	5-Apr	30-Nov	239	1935
BAUCHI	Darazo	10.24	10.59	14-May	1-Nov	173	838
	Alkaleri	10.25	10.32	11-May	3-Nov	178	870
	Toro	09.04	10.03	8-May	5-Nov	184	910
	Bauchi	09.82	10.28	19-May	29-Oct	163	1111
	Jama'are	09.56	11.39	24-May	26-Oct	157	773
	Tafawa Balewa	09.55	09.74	4-May	7-Nov	190	957
	Ganjuwa	10.17	10.86	18-May	30-Oct	168	811
	Bulkachuwa	10.52	11.65	27-May	24-Oct	152	762
	Dambam	10.71	11.68	28-May	23-Oct	151	761
	Yakoba	09.84	10.31	11-May	3-Nov	178	871
	Duguri	09.76	09.90	6-May	6-Nov	187	931
	Misau	10.28	11.18	22-May	27-Oct	161	785

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	Azare	10.17	11.67	28-May	23-Oct	152	761
	Katagum	10.21	12.17	3-Jun	19-Oct	142	755
	Ningi	9.34	11.04	20-May	28-Oct	164	796
	Warji	9.45	11.11	21-May	28-Oct	163	790
BAYELSA	Yenogoa	6.25	4.92	6-Mar	15-Dec	285	2625
	Amassama	6.11	4.97	7-Mar	15-Dec	284	2599
	Ogbia	06.50	04.40	29-Feb	19-Dec	295	2906
	Otuoke	06.31	04.79	5-Mar	16-Dec	287	2694
	Oporoma	06.85	04.80	5-Mar	16-Dec	287	2688
	Sagbama	06.21	05.17	9-Mar	13-Dec	280	2497
	Oloibiri	06.30	04.66	3-Mar	17-Dec	290	2763
	OGBOINBIRI	05.97	04.82	5-Mar	16-Dec	287	2678
	Nembe	06.37	04.48	1-Mar	18-Dec	293	2861
	Brass	6.25	04.30	28-Feb	20-Dec	297	2962
BENUE	Gboko	9	07.32	5-Apr	26-Nov	237	1584
	Makurdi	8.54	07.73	20-Apr	23-Nov	217	1210
	Otukpo	8.14	07.20	3-Apr	27-Nov	240	1626
	Aliade	8.48	07.30	4-Apr	26-Nov	238	1591
	Oju	07.91	07.38	5-Apr	26-Nov	236	1564
	Ugbopko	07.88	07.66	9-Apr	24-Nov	231	1470
	Wanunne	08.89	07.57	8-Apr	24-Nov	232	1500
	Anyiin	08.58	07.71	9-Apr	23-Nov	230	1454
	Okpoga	07.80	07.04	1-Apr	28-Nov	243	1684
	Orokam	07.55	06.97	31-Mar	29-Nov	244	1710
	Egumale	07.96	06.80	29-Mar	30-Nov	248	1774
	Idekpa	07.92	07.23	4-Apr	27-Nov	239	1616
	Obagaji	07.91	07.88	11-Apr	22-Nov	226	1401
	Kyado	09.72	07.65	9-Apr	24-Nov	231	1474
	ZakiBiam	09.61	07.51	7-Apr	25-Nov	234	1520
	Katsina Ala	09.28	07.16	3-Apr	27-Nov	241	1641
	Okpoga	07.80	07.04	1-Apr	28-Nov	243	1684
	Orokam	07.55	06.97	31-Mar	29-Nov	244	1710
	Egumale	07.96	06.80	29-Mar	30-Nov	248	1774
	Idekpa	07.92	07.23	4-Apr	27-Nov	239	1616
	Obagaji	07.91	07.88	11-Apr	22-Nov	226	1401
BORNO	Bama	13.68	11.51	4-Jun	12-Oct	155	767
	Askira/ Uba	12.91	10.65	15-May	31-Oct	172	831
	Gwoza	13.14	11.05	20-May	28-Oct	164	795
	Maiduguri	13.08	11.85	19-Jun	23-Oct	126	562
	KwayaKusar	11.50	10.30	11-May	3-Nov	179	872
	Biu	12.18	10.61	15-May	1-Nov	172	835

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	Kukawa	13.57	12.92	12-Jun	14-Oct	127	778
	Konduga	13.41	11.64	27-May	12-Oct	152	762
	Chibok	13.11	10.85	18-May	30-Oct	168	811
	Magumeri	12.83	12.11	2-Jun	7-Oct	143	754
	Gumsuri	12.82	11.05	20-May	28-Oct	164	795
	Jere	13.20	11.93	20-Jun	21-Oct	146	755
	Dambo	12.75	11.15	21-May	27-Oct	162	787
	Monguno	13.73	12.65	26-Jun	6-Oct	132	765
	Dikwa	14.10	12.04	19-Jun	12-Oct	144	755
CROSS RIVER	Calabar	08.35	04.97	7-Mar	15-Dec	284	2599
	Ikom	8.72	5.97	26-Mar	2-Dec	251	2352
	Akampka	8.35	5.32	11-Mar	12-Dec	277	2423
	Obubra	8.33	6.1	21-Mar	6-Dec	261	2061
	Obudu	9.17	6.65	27-Mar	1-Dec	251	1833
	Otu	8.11	5.29	11-Mar	12-Dec	277	2438
	Okpoma	08.66	06.49	26-Mar	3-Dec	254	1897
	Odukpani	08.35	05.08	8-Mar	14-Dec	282	2543
	Akpet Central	08.10	05.55	14-Mar	10-Dec	272	2312
	Sankwala	09.24	06.60	27-Mar	2-Dec	252	1853
DELTA	Akpabuyo	08.41	04.92	6-Mar	15-Dec	285	2625
	Ugep	08.07	05.82	17-Mar	8-Dec	267	2186
	Ogoja	08.80	06.70	23-Apr	11-Nov	202	1965
	Asaba	06.82	06.23	5-Apr	9-Dec	248	1871
	Abraka	06.10	05.79	17-Mar	8-Dec	268	2200
	Burutu	05.50	05.35	12-Mar	12-Dec	276	2408
	Kwale	06.44	05.72	16-Mar	9-Dec	269	2232
	Ozoro	06.22	05.53	14-Mar	10-Dec	273	2321
	Oduobori	06.06	05.15	9-Mar	13-Dec	280	2507
	Ughelli	05.99	05.50	13-Mar	10-Dec	273	2335
EBONYI	Sapele	05.67	05.89	18-Mar	7-Dec	266	2154
	Warri	05.73	05.52	6-Mar	17-Dec	286	2763
	Abakaliki	08.08	06.33	24-Mar	4-Dec	257	1963
	Ezzagu	08.13	06.34	24-Mar	4-Dec	257	1959
	OdumEffium	08.03	06.74	29-Mar	1-Dec	249	1798
	Ngbo	08.00	06.45	25-Mar	3-Dec	255	1913
	Amagu	07.58	05.87	18-Mar	8-Dec	266	2163
	Echialike	08.22	06.20	22-Mar	5-Dec	259	2018
	Onueke	08.02	06.13	21-Mar	5-Dec	261	2048
	Afikpo	07.91	05.88	18-Mar	7-Dec	266	2159

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	Enugu-Ezike	7.46	6.98	31-Mar	29-Nov	244	1706
	Emene	7.58	6.47	25-Mar	3-Dec	254	1905
	Oji River	07.27	06.25	23-Mar	5-Dec	258	1997
	Nsukka	06.85	07.38	5-Apr	26-Nov	236	1564
	Awgu	07.47	06.07	20-Mar	6-Dec	262	2074
GOMBE	Billiri	11.09	09.50	8-May	9-Nov	194	1000
	Gombe	11.17	10.28	26-May	10-Nov	168	314
	Akko	10.57	10.17	9-May	4-Nov	181	890
	Dukku	10.46	10.49	13-May	2-Nov	175	849
	Nafada	11.10	11.32	23-May	26-Oct	158	777
	Funakaye	11.10	10.17	16-May	4-Nov	181	890
	Kaltungo	11.43	09.82	12-May	7-Nov	188	944
	Balanga	11.68	09.96	14-May	6-Nov	185	921
	Yamaltu	11.30	10.14	16-May	4-Nov	182	894
	Shomgom	11.13	09.39	7-May	10-Nov	197	1022
	Kwami	11.15	10.30	18-May	3-Nov	179	872
IMO	Okigwe	07.35	05.83	17-Mar	8-Dec	267	2181
	Ehime	7.31	5.67	16-Mar	9-Dec	270	2255
	Oguta	6.81	5.71	16-Mar	9-Dec	269	2237
	Obowo	7.32	5.6	15-Mar	10-Dec	271	2288
	Ohaji- Egbema	6.59	4.81	5-Mar	16-Dec	287	2683
	Nkwerre	7.1	5.75	17-Mar	8-Dec	268	2218
	Orlu	07.16	05.32	11-Mar	12-Dec	277	2423
	Orsu	06.96	05.86	18-Mar	8-Dec	266	2168
	Orlu	7.04	5.8	17-Mar	8-Dec	267	2195
	AbohMbaise	07.23	05.46	13-Mar	11-Dec	274	2355
	Umuduru	07.25	05.68	16-Mar	9-Dec	270	2250
	Etiti	07.35	05.62	15-Mar	9-Dec	271	2279
	Uruala	07.10	05.85	18-Mar	8-Dec	266	2172
	Mberichi	06.95	05.36	12-Mar	11-Dec	276	2403
	Owerri	07.03	05.48	13-Mar	11-Dec	274	2345
JIGAWA	Gwiwa	08.33	12.78	10-Jun	15-Oct	130	771
	Basirka	10.24	11.15	21-May	27-Oct	162	787
	Kila	9.77	11.33	24-May	26-Oct	158	776
	Ringim	8.54	12.65	9-Jun	16-Oct	132	765
	Birnin Kudu	9.5	11.45	25-May	25-Oct	156	770
	Gwaram	9.89	11.28	23-May	26-Oct	159	779
	Kafin Hausa	9.91	12.24	4-Jun	19-Oct	140	755
	Maigatari	09.45	12.81	18-Jun	15-Oct	129	772

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	Dutse	09.33	11.80	29-May	22-Oct	149	758
	Amaryawa	08.35	12.56	14-Jun	16-Oct	134	762
	Malaganta	08.28	12.77	17-Jun	15-Oct	130	770
	Kazaure	08.40	12.67	16-Jun	16-Oct	132	766
	Hadejia	10.03	12.40	6-Jun	18-Oct	137	757
	Filla	08.57	12.67	16-Jun	16-Oct	132	766
	Gumel	09.37	12.62	15-Jun	16-Oct	133	764
	Babura	09.02	12.77	10-Jun	15-Oct	130	770
	Aujara	09.43	12.05	1-Jun	20-Oct	144	754
KADUNA	Makarfi	07.88	11.37	24-May	26-Oct	158	774
	Kudan	07.73	11.30	23-May	26-Oct	159	778
	Kaduna	07.45	10.60	16-May	6-Nov	174	1309
	Zaria	07.75	11.07	21-May	31-Oct	163	1050
	Jaba	08.00	09.44	30-Apr	10-Nov	196	1012
	Zonkwa	08.28	09.78	5-May	7-Nov	189	950
	Ikara	08.23	11.18	22-May	27-Oct	161	785
	Kubau	08.38	10.97	19-May	29-Oct	165	801
	Kachia	07.95	09.87	11-May	6-Nov	187	935
	BirninGwari	06.53	10.67	18-May	31-Oct	171	829
	Kafanchan	08.28	09.57	2-May	9-Nov	193	987
	Saminaka	08.68	10.42	12-May	2-Nov	176	857
	Jere	07.44	09.57	2-May	9-Nov	193	987
	Gwantu	08.46	09.23	28-Apr	11-Nov	200	1054
	Kaura	08.15	10.57	14-May	1-Nov	173	840
	Giwa	07.41	11.28	23-May	26-Oct	159	779
	Zonkwa	08.28	09.78	5-May	7-Nov	189	950
KANO	Rogo	07.83	11.57	26-May	24-Oct	154	765
	Dadin Kowa	08.63	10.70	16-May	31-Oct	171	826
	Kachaku	09.26	11.54	26-May	24-Oct	154	766
	Kano	08.53	12.05	5-Jun	17-Oct	134	1000
	Kunchi	08.27	12.50	7-Jun	17-Oct	135	760
	Madobi	08.29	11.78	29-May	23-Oct	149	758
	Kura	08.43	11.77	29-May	23-Oct	150	758
	Bichi	08.24	12.23	9-Jun	19-Oct	141	755
	Kwankwaso	08.40	11.58	30-May	24-Oct	153	764
	Gezawa	08.72	12.03	6-Jun	21-Oct	144	755
	Gaya	09.00	11.83	2-Jun	22-Oct	148	757
	BAGWAI	08.14	12.15	9-Jun	20-Oct	142	754
	Rano	08.57	11.53	29-May	24-Oct	154	766
	GABASAWA	08.92	12.18	3-Jun	19-Oct	142	755

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	DAMBARTA	08.52	12.43	12-Jun	17-Oct	137	758
KATSINA	Faskari	07.02	11.72	28-May	23-Oct	151	760
	Baure	08.75	12.83	18-Jun	10-Oct	129	773
	Katsina	07.68	13.02	11-Jun	7-Oct	118	559
	Kusada	07.98	12.47	6-Jun	17-Oct	136	759
	Kuka	07.99	13.32	24-Jun	27-Sep	119	808
	Funtua	07.30	11.52	26-May	25-Oct	155	767
	Daura	08.30	13.00	13-Jun	30-Sep	109	583
	Matazu	07.67	12.23	3-Jun	19-Oct	141	755
	Musawa	07.67	12.13	2-Jun	20-Oct	143	754
	Mani	07.87	12.86	11-Jun	14-Oct	128	775
	Safana	07.41	12.41	6-Jun	18-Oct	137	758
	Kaita	07.75	13.08	14-Jun	29-Sep	124	789
	Bakori	07.42	11.56	26-May	24-Oct	154	765
	RUMA	07.23	12.87	11-Jun	4-Oct	128	776
	KURFI	7.48	12.66	9-Jun	16-Oct	132	765
	RUNKA	7.31	12.45	6-Jun	17-Oct	136	759
KEBBI	SAKABA	05.60	11.07	20-May	28-Oct	163	793
	CHINCHINNA	05.72	11.47	25-May	25-Oct	156	769
	MAHUTA	04.97	11.55	26-May	24-Oct	154	766
	Yelwa	04.50	11.00	22-May	24-Oct	155	1015
	Maraba	04.73	10.32	11-May	3-Nov	178	870
	BirninKebbi	04.20	12.43	6-Jun	17-Oct	137	758
	Argungu	04.52	12.72	9-Jun	15-Oct	131	768
	Aliero	04.46	12.29	4-Jun	19-Oct	139	756
	Augie	04.59	12.89	12-Jun	14-Oct	128	777
	Zuru	05.23	11.43	25-May	25-Oct	156	771
	Ngaski	04.71	10.40	12-May	2-Nov	177	860
	Bagudo	04.22	11.40	24-May	25-Oct	157	772
	Jega	4.43	12.2	3-Jun	19-Oct	141	755
	Gwandu	4.64	12.5	7-Jun	17-Oct	135	760
	Bagizza	4.42	12.97	12-Jun	13-Oct	126	781
	Illo	3.7	11.55	26-May	24-Oct	154	766
KOGI	Lokoja	6.74	7.8	20-Apr	27-Nov	221	1229
	Okene	6.23	7.55	7-Apr	24-Nov	233	1506
	Idah	6.73	7.11	2-Apr	28-Nov	242	1659
	Ajaokuta	6.65	7.56	8-Apr	24-Nov	233	1503
	Ero	06.69	07.58	8-Apr	24-Nov	232	1497
	Imbaka	06.67	06.55	26-Mar	2-Dec	253	1873
	Amabo	06.72	06.63	27-Mar	2-Dec	251	1841
	Ogwo	06.65	06.75	29-Mar	1-Dec	249	1794

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	Onyedega	06.67	06.88	30-Mar	30-Nov	246	1744
	Iyara	05.97	07.84	11-Apr	22-Nov	227	1414
	Mopa	05.89	08.09	14-Apr	20-Nov	222	1339
	Ife	05.76	07.92	12-Apr	22-Nov	226	1389
	Isanlu	05.67	08.15	15-Apr	20-Nov	221	1321
	Ejiba	05.63	08.30	17-Apr	19-Nov	218	1279
	Kabba	06.07	07.84	11-Apr	22-Nov	227	1414
	Ayangba	07.17	07.49	7-Apr	25-Nov	234	1526
	Ankpa	07.63	07.43	6-Apr	25-Nov	235	1547
	Itobe	07.56	07.72	10-Apr	23-Nov	229	1451
	Obajana	06.43	07.91	12-Apr	22-Nov	226	1392
KWARA	Ilorin	04.54	08.89	19-Apr	26-Nov	221	1287
	Lafiagi	05.41	08.85	23-Apr	14-Nov	207	1138
	Offa	04.72	08.15	15-Apr	20-Nov	221	1321
	Ijaralsin	05.02	08.25	16-Apr	19-Nov	219	1293
	Omu Aran	05.09	08.14	15-Apr	20-Nov	221	1324
	Osi	05.23	08.08	14-Apr	20-Nov	222	1342
	Share	04.98	08.82	23-Apr	15-Nov	208	1146
	Pategi	05.76	08.72	22-Apr	15-Nov	210	1170
	Kalama	03.95	09.61	3-May	8-Nov	192	980
	Afon	04.53	08.31	17-Apr	19-Nov	218	1276
	kosubosu	03.25	09.57	2-May	9-Nov	193	987
	Araromi Opin	05.82	08.14	15-Apr	20-Nov	221	1324
	Jebba	04.82	09.11	26-Apr	12-Nov	202	1080
	Esie	04.89	08.21	6-Mar	15-Dec	285	2641
	Bwen	02.89	08.84	11-Feb	31-Dec	325	3832
	Ilofa	05.14	08.09	14-Apr	20-Nov	222	1339
	Owulsin	05.02	08.28	16-Apr	19-Nov	218	1285
	OkeOyi	04.72	08.58	20-Apr	16-Nov	213	1205
Lagos	Ikeja	03.33	06.58	18-Mar	15-Dec	272	1520
	Ikorodu	03.50	06.60	27-Mar	2-Dec	252	1853
	Badagry	02.88	06.37	24-Mar	4-Dec	256	1946
	Kosofe	03.40	06.59	27-Mar	2-Dec	252	1857
	Somolu	03.38	06.54	26-Mar	2-Dec	253	1877
	Surulere	3.35	6.5	26-Mar	3-Dec	254	1893
	Ojo	3.15	6.46	25-Mar	3-Dec	254	1909
	Iyana Ipaja	3.29	6.62	27-Mar	2-Dec	251	1845
	Oshodi	3.5	6.3	23-Mar	4-Dec	258	1976
	Marine	3.25	6.26	23-Mar	4-Dec	258	1993
	Lagos Island	03.06	06.58	27-Mar	2-Dec	252	1861
	Epe	03.98	06.56	26-Mar	2-Dec	252	1869

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	Ajah	03.57	06.47	25-Mar	3-Dec	254	1905
	Yaba	03.38	06.51	26-Mar	3-Dec	253	1889
	Egbeda	03.29	06.59	27-Mar	2-Dec	252	1857
	Agbara	03.09	06.51	26-Mar	3-Dec	253	1889
	Ikotun	03.30	06.51	26-Mar	3-Dec	253	1889
	Apapa	03.37	06.45	25-Mar	3-Dec	255	1913
	Agege	03.33	06.62	27-Mar	2-Dec	251	1845
NASARAWA	Lafia	08.51	08.49	20-Apr	10-Nov	204	1228
	Akwanga	08.41	08.91	24-Apr	14-Nov	206	1124
	Keffi	07.88	08.85	23-Apr	14-Nov	207	1138
	Wamba	08.60	08.94	24-Apr	14-Nov	205	1117
	Doma	08.36	08.40	18-Apr	18-Nov	216	1252
	Amaku	08.13	08.24	16-Apr	19-Nov	219	1296
	Gidan Rai	08.36	08.06	14-Apr	20-Nov	223	1347
	Bakara	07.49	08.36	17-Apr	18-Nov	217	1263
	Kainyehu	07.14	08.09	14-Apr	20-Nov	222	1339
	Toto	07.08	08.39	18-Apr	18-Nov	216	1255
	Giza	08.63	08.20	15-Apr	19-Nov	220	1307
	Uke	07.69	08.91	24-Apr	14-Nov	206	1124
	Gwadi	08.34	08.92	24-Apr	14-Nov	206	1122
	Ninga	08.31	09.09	26-Apr	12-Nov	202	1084
	Awe	09.14	08.11	14-Apr	20-Nov	222	1333
	Obi	08.76	08.36	17-Apr	18-Nov	217	1263
	Keana	08.80	08.15	15-Apr	20-Nov	221	1321
NIGER	Kontagora	05.47	10.40	12-May	2-Nov	177	860
	Minna	06.55	09.61	30-Apr	23-Nov	207	1196
	Bida	06.01	09.07	8-May	6-Nov	182	1088
	Warari	05.32	10.92	19-May	29-Oct	166	805
	Rijau	05.25	11.10	21-May	28-Oct	163	791
	Wushishi	06.11	09.72	4-May	8-Nov	190	961
	Duku	04.88	11.20	22-May	27-Oct	161	784
	Kwamba	07.17	09.20	28-Apr	12-Nov	200	1060
	Shiroro	06.80	09.98	7-May	6-Nov	185	918
	Mokwa	05.05	09.29	29-Apr	11-Nov	199	1042
	Gbako	05.97	09.00	25-Apr	13-Nov	204	1104
	Paiko	06.63	09.43	30-Apr	10-Nov	196	1014
	Agwara	04.31	10.89	18-May	29-Oct	167	808
	Lapai	06.57	09.05	26-Apr	13-Nov	203	1093
	Kutlwenji	05.68	09.52	1-May	9-Nov	194	997
	Baro	06.42	08.64	21-Apr	16-Nov	211	1190
OGUN	Ijebu-Ode	03.93	06.83	30-Mar	30-Nov	247	1763

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	Ayetoro	03.03	07.23	4-Apr	27-Nov	239	1616
	Abigi	04.33	06.54	26-Mar	2-Dec	253	1877
	Ijebu-Igbo	04.00	06.95	31-Mar	29-Nov	245	1718
	Ewekoro	03.22	06.03	20-Mar	6-Dec	263	2092
	Ipokia	02.84	06.52	26-Mar	2-Dec	253	1885
	Odogbolu	03.76	06.83	30-Mar	30-Nov	247	1763
	Ikenne	03.71	06.86	30-Mar	30-Nov	246	1751
	Oja-Odan	02.84	06.89	30-Mar	30-Nov	246	1740
	Ilaro	03.02	06.89	30-Mar	30-Nov	246	1740
	Eruwa	03.50	07.40	6-Apr	26-Nov	236	1557
	Otta	03.30	06.68	28-Mar	1-Dec	250	1821
	Abeokuta	03.33	07.20	3-Apr	27-Nov	240	1626
	Sagamu	03.63	06.83	30-Mar	30-Nov	247	1763
ONDO	Akure	05.30	07.20	21-Mar	3-Dec	257	1383
	Ondo	04.83	07.10	11-Mar	27-Nov	261	1599
	Owo	05.58	07.18	3-Apr	27-Nov	240	1633
	Opuba	04.90	06.05	20-Mar	6-Dec	262	2083
	Okitipupa	04.70	06.50	26-Mar	3-Dec	254	1893
	Araromi	04.50	06.60	27-Mar	2-Dec	252	1853
	Ilawe	05.06	07.40	6-Apr	26-Nov	236	1557
	IkareAkoko	05.80	07.50	7-Apr	25-Nov	234	1523
	Idanre	05.14	07.09	2-Apr	28-Nov	242	1666
	Ile-oluji	04.86	07.19	3-Apr	27-Nov	240	1630
	Okeigbo	04.72	07.17	3-Apr	27-Nov	240	1637
	Odigbo	04.86	06.79	29-Mar	30-Nov	248	1778
	Ilaje	05.20	07.27	4-Apr	27-Nov	238	1602
	KajolaOwena	05.00	07.20	3-Apr	27-Nov	240	1626
	Owo	05.58	07.18	3-Apr	27-Nov	240	1633
OSUN	Ila	04.90	08.00	13-Apr	21-Nov	224	1365
	Oshogbo	04.50	07.82	1-Apr	19-Nov	232	1309
	Ilesa	04.73	07.62	8-Apr	24-Nov	231	1483
	Ile Ife	04.55	07.47	6-Apr	25-Nov	234	1533
	IjebuJesa	04.82	07.68	9-Apr	23-Nov	230	1464
	Okeigbo	04.70	07.16	3-Apr	27-Nov	241	1641
	Ikirun	04.70	07.90	12-Apr	22-Nov	226	1395
	Ede	04.43	07.73	10-Apr	23-Nov	229	1448
	Ilobu	04.48	07.84	11-Apr	22-Nov	227	1414
	Ila-Orogun	04.89	08.01	13-Apr	21-Nov	224	1362
	Gbongan	04.35	07.46	6-Apr	25-Nov	235	1536
	Iperindo	04.82	07.49	7-Apr	25-Nov	234	1526
	Iragbiji	04.70	07.89	12-Apr	22-Nov	226	1398

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	Epigbo	04.32	07.90	12-Apr	22-Nov	226	1395
	Ikirun	04.70	07.90	12-Apr	22-Nov	226	1395
	Iwo	04.18	07.63	8-Apr	24-Nov	231	1480
OYO	Shaki	03.47	08.35	5-Apr	20-Nov	229	1083
	Iseyin	03.60	07.97	30-Mar	27-Nov	242	1171
	Ogbomoso	04.25	08.14	15-Apr	20-Nov	221	1324
	Oyo	03.93	07.84	11-Apr	22-Nov	227	1414
	Igbeti	04.13	08.75	22-Apr	15-Nov	209	1162
	Iwere Ile	03.05	07.98	13-Apr	21-Nov	224	1371
	Okcho/Okelho	03.35	08.03	13-Apr	21-Nov	223	1356
	Igbo Ora	03.28	07.43	6-Apr	25-Nov	235	1547
	Ido	03.71	07.50	7-Apr	25-Nov	234	1523
	Awe	03.94	07.82	11-Apr	22-Nov	228	1420
	Iresa	04.43	08.09	14-Apr	20-Nov	222	1339
	Ago Are	03.42	08.50	19-Apr	17-Nov	214	1225
	Kishi	03.85	09.08	26-Apr	13-Nov	203	1086
	Oke- Ile	03.02	07.93	12-Apr	21-Nov	225	1386
	Igboho	03.75	08.83	23-Apr	14-Nov	208	1143
	Ibadan	03.90	07.43	27-Mar	26-Nov	244	1328
PLATEAU	Jos	08.88	09.93	9-May	9-Nov	184	1268
	Bokkos	08.99	09.30	29-Apr	11-Nov	198	1040
	Pankshin	09.43	09.33	29-Apr	11-Nov	198	1034
	Langtang	09.80	09.15	27-Apr	12-Nov	201	1071
	Bukuru	08.86	09.77	4-May	7-Nov	189	952
	Mangu	09.14	09.49	4-Jun	10-Oct	128	626
	Mabudi	09.86	08.58	20-Apr	16-Nov	213	1205
	Damshin	09.45	08.63	21-Apr	16-Nov	212	1192
	Riyom	8.71	9.58	2-May	9-Nov	193	985
	Quan'pan	9.28	8.97	25-Apr	13-Nov	205	1111
	Wase	9.96	9.1	26-Apr	12-Nov	202	1082
	Dengi	9.95	9.37	30-Apr	10-Nov	197	1026
	Ganjuwa	10.31	9.44	30-Apr	10-Nov	196	1012
	Kwabzak	09.50	09.13	27-Apr	12-Nov	202	1075
	Yelwa-Shendam	09.66	08.81	23-Apr	15-Nov	208	1148
RIVERS	Phc	07.12	04.85	1-Mar	14-Dec	288	2251
	Ahoade	06.65	05.09	8-Mar	14-Dec	281	2538
	Bori	07.37	04.68	3-Mar	17-Dec	289	2752
	Buguma	06.86	04.74	4-Mar	16-Dec	288	2720
	Elele	06.82	05.10	9-Mar	14-Dec	281	2533
	Degema	06.77	04.77	5-Mar	16-Dec	288	2704
	Omoko	06.65	05.34	12-Mar	12-Dec	276	2413

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	Rumuodogo	06.79	04.92	6-Mar	15-Dec	285	2625
	Ogoni	07.15	04.78	5-Mar	16-Dec	287	2699
	Emohua	06.86	04.88	6-Mar	15-Dec	286	2646
	Eleme	07.11	04.79	5-Mar	16-Dec	287	2694
	Abonnema	06.77	04.72	4-Mar	16-Dec	289	2731
	Oyigbo	07.14	04.87	6-Mar	15-Dec	286	2651
	Opobo	07.55	04.62	3-Mar	17-Dec	291	2785
	Bonny	07.15	04.42	29-Feb	19-Dec	295	2895
	Okrika	07.08	04.74	4-Mar	16-Dec	288	2720
SOKOTO	Sakwabe	04.22	13.16	20-Jun	12-Oct	122	795
	Garin Isa	04.58	11.63	27-May	24-Oct	152	763
	Sokoto	05.20	12.92	4-Jun	10-Oct	128	626
	TUNgan Magaji	04.95	12.07	2-Jun	20-Oct	144	754
	Domawa	04.70	12.35	5-Jun	18-Oct	138	757
	Tambuwal	04.71	12.26	4-Jun	19-Oct	140	755
	Shagari	04.99	12.62	8-Jun	16-Oct	133	764
	Goronyo	05.67	13.43	18-Jun	10-Oct	117	818
	Wamako	5.09	13.03	13-Jun	13-Oct	125	785
	Bodinga	5.22	13.04	13-Jun	13-Oct	125	786
	KURAWA	6.36	13.52	19-Jun	9-Oct	115	827
	GWAZANGE	4.26	13.42	18-Jun	10-Oct	117	817
	DANBOKA	5.37	13.73	22-Jun	7-Oct	111	850
	ALIKERU	05.99	12.93	12-Jun	14-Oct	127	779
TARABA	Bali	10.96	07.85	11-Apr	22-Nov	227	1411
	Gashaka	11.49	07.37	5-Apr	26-Nov	236	1567
	Zing	11.75	09.00	25-Apr	13-Nov	204	1105
	Karim Lamido	11.19	09.30	29-Apr	11-Nov	198	1040
	Ibi	09.75	08.18	27-Apr	21-Nov	208	1107
	Donga	10.05	07.72	10-Apr	23-Nov	229	1451
	Wukari	09.78	07.88	11-Apr	22-Nov	226	1401
	Gembu	11.25	06.72	28-Mar	1-Dec	249	1805
	Lau	11.27	9.21	28-Apr	12-Nov	200	1058
	Chediya	10.2	8.18	15-Apr	20-Nov	220	1313
	Tsokundi	10.01	7.88	11-Apr	22-Nov	226	1401
	Abako	9.89	7.63	8-Apr	24-Nov	231	1480
	Dooshima	9.69	8.23	16-Apr	19-Nov	219	1299
	Dampar	10.13	08.53	19-Apr	17-Nov	214	1218
	Moti	09.82	08.18	15-Apr	20-Nov	220	1313
	Abbare	11.61	09.25	28-Apr	11-Nov	199	1050
	GarinBakari	10.98	08.56	20-Apr	17-Nov	213	1210
	Gassol	10.36	08.59	20-Apr	16-Nov	212	1202

2018 SEASONAL RAINFALL PREDICTION (SRP)

YOBE	Gujba	11.56	11.30	23-May	26-Oct	159	778
	Yusufari	11.21	13.08	22-Jun	12-Oct	124	789
	Jakusko	10.14	12.38	13-Jun	18-Oct	138	757
	Nguru	10.46	12.88	29-Jun	20-Oct	113	467
	Potiskum	11.03	11.7	1-Jun	21-Oct	142	671
	Fika	11.18	11.28	23-May	26-Oct	159	779
	Damaturu	11.96	11.74	29-May	23-Oct	150	759
	Geidam	11.55	12.89	19-Jun	14-Oct	128	777
	Machina	09.59	13.06	21-Jun	13-Oct	124	787
	Yunusari	11.44	13.07	21-Jun	12-Oct	124	788
ZAMFARA	Iraba	06.28	10.97	19-May	29-Oct	165	801
	Doka Ayi	06.10	11.09	21-May	28-Oct	163	792
	Gusau	06.77	12.17	1-Jun	27-Oct	148	891
	Donko	05.20	11.75	29-May	23-Oct	150	759
	Galadi	06.43	13.06	14-Jun	13-Oct	124	787
	Zurmi	06.78	12.79	10-Jun	15-Oct	130	771
	Gummi	05.10	12.13	2-Jun	20-Oct	143	754
	TalataMafara	06.07	12.55	7-Jun	17-Oct	134	762
	Bakura	05.87	12.60	8-Jun	16-Oct	133	763
	Shinkafi	06.50	13.07	14-Jun	12-Oct	124	788
	BirninMagaji	06.86	12.34	5-Jun	18-Oct	138	756
	Maru	06.33	11.68	28-May	23-Oct	151	761
	Bukkuyum	05.46	12.13	2-Jun	20-Oct	143	754
	ANKA	05.93	12.11	2-Jun	20-Oct	143	754
	KURUA	05.64	12.47	6-Jun	17-Oct	136	759
FCT	Abuja	07.48	09.07	28-Apr	23-Nov	209	1481
	Kwali	07.06	08.85	23-Apr	14-Nov	207	1138
	Karshi	07.55	08.82	23-Apr	15-Nov	208	1146
	Gwagwalada	07.09	08.94	24-Apr	14-Nov	205	1117
	Kuje	07.22	08.92	24-Apr	14-Nov	206	1122
	Gwaska	07.28	09.02	25-Apr	13-Nov	204	1099
	Madalla	07.22	09.11	26-Apr	12-Nov	202	1080
	Bwari	07.39	09.28	29-Apr	11-Nov	199	1044
	Asokoro	07.51	09.04	26-Apr	13-Nov	203	1095
	Pegi	7.48	9.06	26-Apr	13-Nov	203	1090
	Bassa	6.79	8.63	21-Apr	16-Nov	212	1192
	Kubwa	7.31	9.14	27-Apr	12-Nov	201	1073
	Zuba	7.39	9.06	26-Apr	13-Nov	203	1090
	Gosa	7.29	8.94	24-Apr	14-Nov	205	1117
	Chukuku	7.15	8.84	23-Apr	14-Nov	207	1141
	Abaji	6.94	8.47	19-Apr	17-Nov	215	1233
	Tando	6.85	9.2	28-Apr	12-Nov	200	1060

5.0 Glossary

1. **Agro-meteorological information** - Weather and climate information that, if applied to guide agricultural activities, improves yields and enhances coping strategies against adverse impact of climate-related hazards in the sector.
2. **Annual rainfall amount** - is the total amount of rainfall observed and recorded in the year under reference.
3. **Cessation-date of rainy season** - Cessation date is determined when the available water content at the root zone has dropped to 50%.
4. **Climate change** - Is a non-random change in climate that is measured over several decades or longer, which may be due to natural or human-induced causes.
5. **Climate variability** - refers to variations in the mean state and other statistics such as standard deviations, the occurrence of extremes, climate on all spatial and temporal scales beyond that of the individual events. Variability may be due to natural internal processes within the climate system or anthropogenic external forcing.
6. **Coastal inundation** - Flooding, which occurs when water is driven onto land from an adjacent body of water such as the sea or ocean.
7. **Comfort Index** - An index of air temperature that provides daily satisfaction with the thermal environment or an index, which combines air temperature and relative humidity to determine satisfaction with the thermal environment.
8. **Dry season farming** - Farming practices sustained by irrigation during period of little or no rainfall.
9. **El- Nino** - A warming of the Pacific Ocean water near the equator, off the coast of Peru, that typically occurs every 3 – 7 years, and which dictates a shift in normal weather patterns.
10. **ENSO (El- Nino - Southern Oscillation)** - a combination of El-Niño features and strength of surface air pressure between the tropical eastern and western Pacific ocean waters, which is usually computed from fluctuation in the surface air pressures between Tahiti and Darwin in Australia.
11. **ENSO - Neutral** -normal temperature conditions in the ocean water of the equator off the coast of Peru in South America.
12. **Extreme weather** - is an event that is rare at a particular place and time of the year. Extreme weather event would normally be as rare as or rarer than the 10 or 90 percentile of the observed probability density function.
13. **Global warming** - An overall increase in the world temperatures, which is often caused by additional heat being trapped by greenhouse gases mostly as a result of human activities.
14. **Green House Effect** - The warming generated by the trapping of long-wave

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