THE IMPACT OF THE 2012 FLOODS ON AGRICULTURE AND FOOD SECURITY IN NIGERIA USING GIS

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BACKGROUND

Nigeria is located in the tropical zone of West Africa with a total area of 923,770 km².

Its climate is characterized by two extreme weather conditions: humidity in the south and dryness in the north.

Nigeria is divided into mangrove, rainforest, montane, guinea, sudan and sahel savannah ecological zones.

Nigeria’s wide range of agro-ecological zones allows for a diversity of crop production activities:
- Yam, cassava, sorghum, millet, maize, groundnuts and cotton are grown in the northern savannah
- In the South, the main food crops are cassava, yam, plantain, maize and sorghum while the main cash crops are oil palm, cocoa and rubber
STATEMENT OF THE PROBLEM

In the months of September and October 2012, severe flooding ravaged Nigeria disrupting various sectors of Nigeria’s economy.

This was caused by excessive rainfall within and outside Nigeria as well as water releases from the Lagdo reservoir in the Republic of Cameroun.

It washed away farmlands, settlements and other critical infrastructure such as roads, bridges, communication and power Installations.
AERIAL VIEW OF FLOODING IN LOKOJA, KOGI STATE
DESTROYED FARMLAND IN KWARA STATE
OBJECTIVES

1. To identify destroyed food crops locations that may lead to food scarcity.

2. To identify areas not affected that may result into surplus food.

3. To give baseline information for emergency planning and rehabilitation of farming systems after the flood disaster.
METHODOLOGY

- GIS tools available in ArcGIS 10.0 were used to identify flooded locations and estimate food crops production areas affected. And it was also used for data integration and analysis.
Onset of Flood
IMPACT OF THE FLOOD

1. ON THE POPULACE

• A total of 95 LGAs were flooded in 14 states of the country which are within the River Niger and Benue basins between September and October 2012. (the peak period of the flood). This represents 12.3% of the 774 LGAs in Nigeria. The entire population of the area is over 15.8 million (1996 Census). They are to be affected directly or indirectly.
A Total of 95 LGAs Were Affected in 14 States

Note: These are strictly local government areas flooded as a result of the release of water from Lagdo and Kainji dam into River Benue and River Niger respectively.

Legend
- Blue: River
- Red: Affected LGAs
- Gray: Affected States

Produced by NEMA GIS Unit
October 2012
IMPACT OF THE FLOOD

2. ON AGRICULTURE AND FOOD SECURITY

a. Tuber Crops
A significant percentage of areas that produce the three main tuber food crops in Nigeria: Yam, Cassava and Sweet Potatoes were affected.
- 27.9% of Yam production areas were affected
- 21.6% of Cassava production areas were affected
- 17.2% of Sweet Potato production areas were affected

Yam
Yam may be deficit in Benue, Kogi, Kwara, Niger, Taraba, Anambra, Cross River, Delta, Edo and Imo states especially because the flood occurred in the mid-season.

Due to the good rains this year, Oyo, Osun, Ogun, Ondo, Ekiti, Abuja, Nasarawa, Kaduna, Imo, Abia, Enugu and Ebonyi might experience surplus yam yield.

Cassava
This indicates that cassava may be deficit in Anambra, Bayelsa, Benue, Cross River, Delta, Imo, Edo, Kogi, Kwara, Rivers.

While in Abia, Akwa Ibom, Ebonyi, Ekiti, Enugu, Lagos, Ogun, Ondo, Osun, Oyo might experience surplus yam yield.
MAP OF NIGERIA SHOWING TUBER CROPS PRODUCING AREAS AFFECTED BY FLOOD IN SEPT - OCT 2012

Note: These are food crops only

LEGEND

- **Cassava**
- **Yam**
- **SweetPotato**
- **Affected LGAs**

Percentage of Tuber Crops Affected by Flood

- 17.2% Sweet Potato
- 21.8% Cassava
IMPACT OF THE FLOOD

2. ON AGRICULTURE AND FOOD SECURITY

b. Cereal Crops
Out of the five main cereal food crops produced in Nigeria, only Sorghum, Rice and Maize producing areas were affected. Cowpea and Millet producing areas were not affected by the flood.

• 31.4% of Rice producing areas were affected
• 20.1% of Maize producing areas were affected
• 14% of Sorghum producing areas were affected

Rice
Rice may be deficit in Benue, Kogi, Kwara, Niger, Taraba, Adamawa Anambra, Cross River, Delta, Edo and Imo states.

Due to the good rains this year, Plateau, Ondo, Ekiti, Abuja, Nasarawa, Kaduna, Abia, Bauchi, Enugu and Ebonyi might experience surplus rice yield.

Maize (Corn)
Based on Nigeria’s crop calendar, maize planted in the main growing season had already been harvested in the south and harvesting was ongoing when the flood occurred in September-October 2012 in the north. Second maize growing season was at the sowing stage at this period, hence, the effect on maize should be relatively minimal in the far north.

This indicates that maize may be deficit in Adamawa, Anambra, Niger, Benue, Cross River, Edo, Kogi, Kwara, Taraba.

While in Bauchi, Ebonyi, Ekiti, Enugu, Abuja, Kaduna, Nassarawa, Plateau Ogun, Ondo, Osun, Oyo might experience surplus maize yield.
MAP OF NIGERIA SHOWING CEREAL CROPS PRODUCING AREAS AFFECTED BY FLOOD IN SEPT - OCT 2012

LEGEND
- Sorghum
- Cowpea
- Millet
- Rice
- Maize
- Affected LGAs

Note: These are food crops only

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October 2012
MAP OF NIGERIA SHOWING PROBABLE DEFICIT AND SURPLUS YAM PRODUCING AREAS AS A RESULT OF SEPT- OCT 2012 FLOOD

12 States may have Deficit Yam production, while 10 States might have Surplus

Note: These are food crops only

LEGEND
- States
- Deficit Yam
- Surplus Yam

Produced by NEMA GIS Unit
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MAP OF NIGERIA SHOWING PROBABLE DEFICIT AND SURPLUS CASSAVA PRODUCING AREAS AS A RESULT OF SEPT- OCT 2012 FLOOD

10 States may have Deficit Cassava production, while 10 States might have Surplus

Note: These are food crops only

LEGEND
- Red: Deficit Cassava
- Blue: Surplus Cassava
- States

Produced by NEMA GIS Unit October 2012
MAP OF NIGERIA SHOWING PROBABLE DEFICIT AND SURPLUS RICE PRODUCING AREAS AS A RESULT OF SEPT - OCT 2012 FLOOD

10 States may experience Deficit Rice production, while 11 States may experience Surplus

Note: These are food crops only

LEGEND
- States
- Deficit Rice
- Surplus Rice

Produced by NEMA GIS Unit October 2012
MAP OF NIGERIA SHOWING PROBABLE DEFICIT AND SURPLUS MAIZE PRODUCING AREAS AS A RESULT OF SEPT - OCT 2012 FLOOD

9 States may experience Deficit Maize (Corn) production, while 12 States may experience Surplus Maize production.

Note: These are food crops only.

LEGEND
- States
- Deficit Maize
- Surplus Maize

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CONCLUSION

1. The analysis has an insight on food crops production in areas of surplus and those that may experience scarcity.

2. It was in the mid season and mainly the harvest period that flood was at its peak.

3. It has given us solid basis for emergency planning, and post-flood management of our agricultural systems.

4. The result of the analysis is to be incorporated into Nigerian National Development Plan to ensure food for the populace in the face of increasing climate change and variability.

5. The above would be done in collaboration with the relevant ministries, departments and agencies in the country.
THANKS FOR LISTENING.