

# PREVENTION OF ENVIRONMENTAL FLOODING THROUGH WASTE MANAGEMENT

# ASSP NIGERIA CHAPTER KNOWLEDGE SHARING SERIES

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# **OVERVIEW**







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River flooding – occurs along rivers.

Urban flooding – occurs
when the drainage
system in a city or town
fails to absorb the water
from heavy rain.

of water onto dry land from water bodies such as lakes, rivers, or oceans.

This leads to the escape of water from it's usual boundaries.

Coastal flooding – occurs as a result of winds generated from tropical storms and hurricanes that drive ocean water inland.

Flash flooding – occurs as a result of sudden heavy rainfall.



# **OUTLINE**

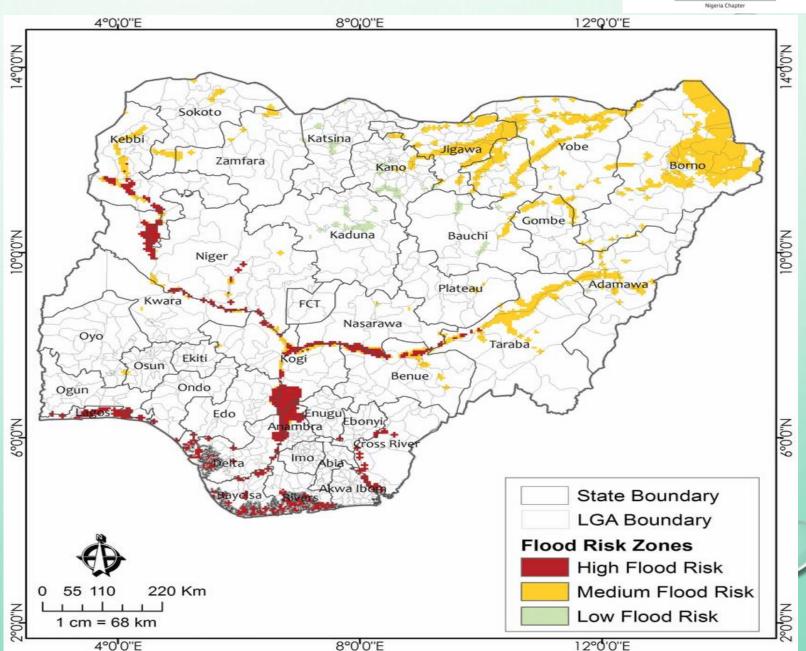
AMERICAN SOCIETY OF SAFETY PROFESSIONALS
Nigeria Chapter

- > Statistics of Flooding in Nigeria
- > What causes flooding?
- > The role of waste in flooding
- Waste types and categories
- > Municipal waste management
- > Technology and waste management
- > Benefits of proper waste management
- > Community engagement
- > Government policies and regulations
- > Solution to environmental flooding and poor waste management
- > Conclusion

# STATISTICS OF FLOODING IN NIGERIA



> Flood-risk map of Nigeria showing vulnerable States and LGAs Chukwudi et al. 2020 May (https://www.researchgate.net/f igure/Flood-risk-map-of-Nigeriashowing-vulnerable-States-and-LGAs fig10 341279305)



# STATISTICS OF FLOODING IN NIGERIA



# > Reliefweb

https://reliefweb.int/repo rt/nigeria/selected-floodincidents-nigeria-juneoctober-2022

## SELECTED FLOOD INCIDENTS IN NIGERIA

(JUNE - OCTOBER 2022)





CROSS RIVER

ONDO

### JUNE 25, 2022

### ANAMBRA

The flood washed away 30 shops, electric poles and cables in Ogbaru market, 60% of lands in the state are underwater

### JUNE 29, 2022

### KANO

2250 houses destroyed, 14,496 farms affected

### JULY 19, 2022

### BAUCHI

100 houses destroyed



#### **OCTOBER 9, 2022**

#### GOMBE

Worst affected are Pamadu, Kwara, Tambau, Gwalameche

### OCTOBER 10, 2022

### RIVERS

Over 20 communities in Ogba Egbema Ndoni LGA have been submerged, with schools, farms and bridges affected. The Orashi River overflow affected

### **OCTOBER 10, 2022**

### LAGOS

Kosofe is heavily affected because the of the release of water from the Oyan Dam by the Ogun Oshun River Basin Development Authority

### OCTOBER 10, 2022

#### NASARAWA

Olam's 4400 hectare rice farmland is submerged

### JULY 22, 2022

### BORNO

Communities in Damboa, Jere, Maiduguri etc heavily affected

### JULY 24, 2022 YOBE

59 communities in 11 local government areas damaged

## AUGUST 25, 2022

### JIGAWA

Over N1.5trn have been lost to recurrent floods, 272,189 people affected while 76,887 have lost their houses

### AUGUST 28, 2022

### BENUE

Several parts of Makurdi were under water

### SEPT. 17, 2022

### TARABA

Most affected areas are Lau and Karim Lamido LGAs

### OCTOBER 15, 2022

## KATSINA

All 34 LGAs are seriously affected by the disaster as 16,625 houses have been damaged

### JULY 22, 2022

### DELTA

3233 households displaced in Ndokwa

# PLATEAU

13 communities in Langtang South were affected as 220 houses and several farms were submerged

# ADAMAWA

The rains in Madagali LGA have displaced hundreds, while 10 people were killed in Girei

### SEPT. 2, 2022

### NIGER

Some link roads in Lavun, Rafi, Kotongora, Mashegu etc were washed away. 18 LGAs in total were affected by varying impacts of the flood.

### SEPT. 25 2022

### KOGI

500 houses submerged, and LGAs like Ajaokuta, Lokoja etc cut off from each other.

### OCTOBER 15, 2022

### BAYELSA

300 communities partially or totally submerged, 700k persons displaced. Worst affected are Sagbama, Ekeremor, Ogbia, Southern Ijaw

# WHAT CAUSES FLOODING?



- Extreme stormy weather
- Spatial density of river network
- Topographic terrain conditions

• Land development and utilization

- economic activities of population
  - construction of technical facilities

Flooding in rivernetwork

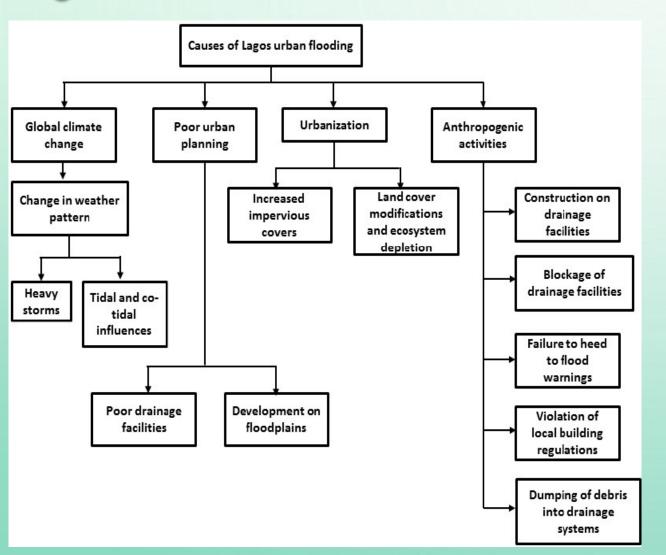
 Land space flood control system is not yet perfect network cities cities cities

Human settlement collaborative governance system has not yet been formed

# WHAT CAUSES FLOODING?



Main causes of urban flooding in the Lagos area of Nigeria Ugonna Nkwunonu et al. February 2016











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# THE ROLE OF WASTE IN FLOODING



> Waste is any unwanted or unusable material.

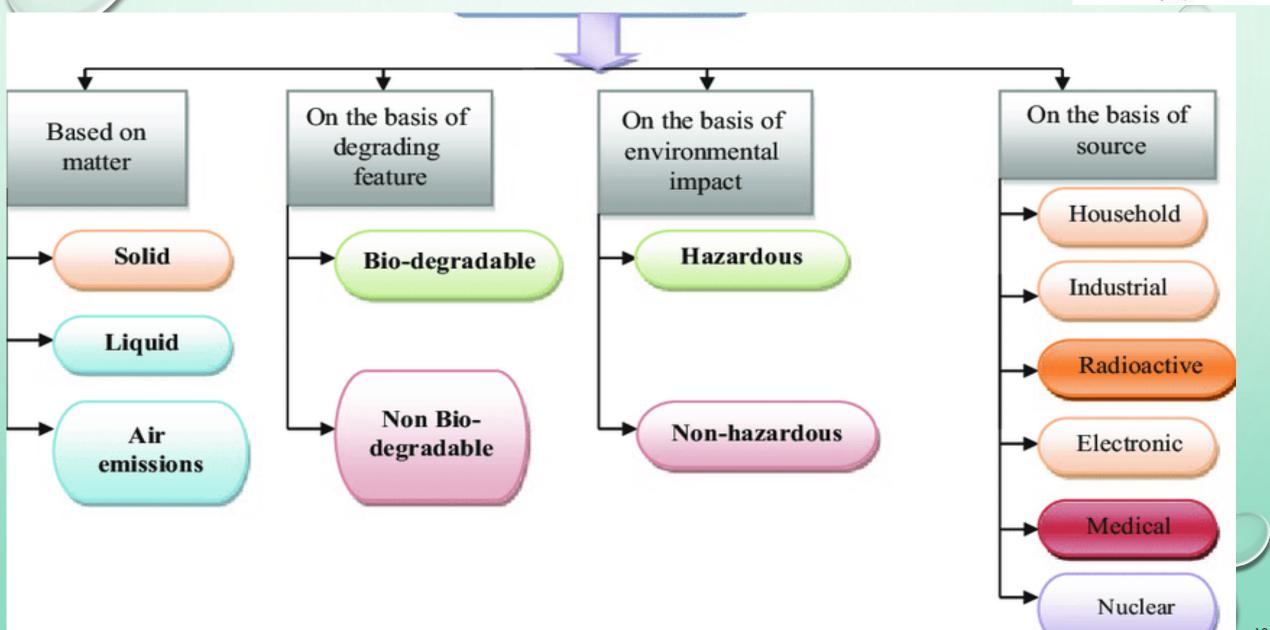
Waste contributes to flooding in the following ways;

- blockage of the drainages systems.
- Influence the flood of runoff in the canal system.
- blockage of sewage systems.
- open waste dumps in low lands / wetlands reduces the natural flood retention capabilities.



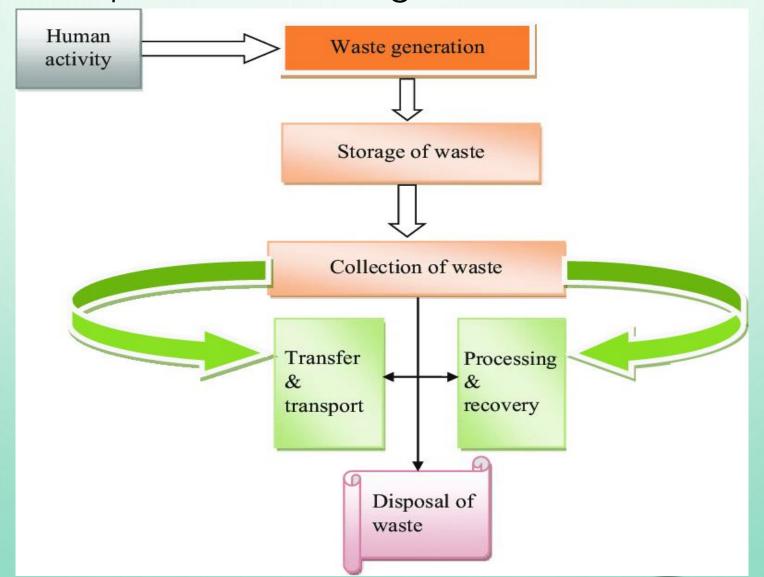
# WASTE TYPES AND CATEGORIES







> Sustainable Municipal Waste Management





Recycling

# **Plastic Products Recycling Process**



> Composting



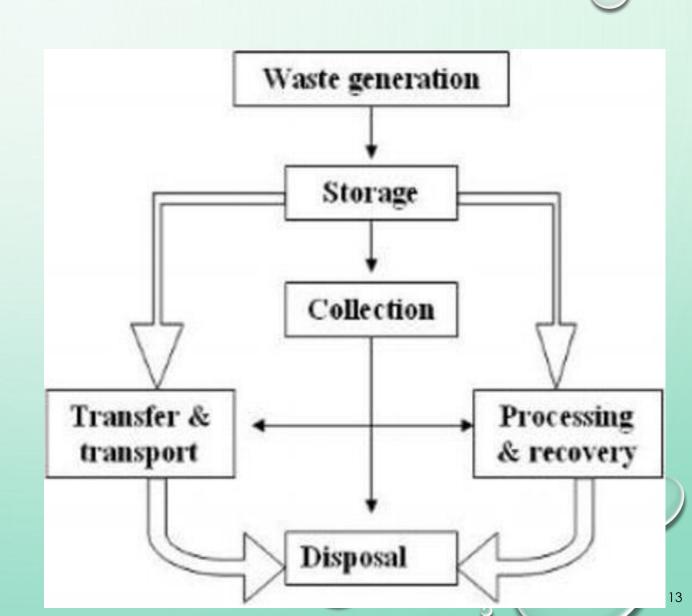




> Hazardous waste management

# These include;

- Radioactive substances
- Bio-medical waste
- Chemicals
- Flammable waste





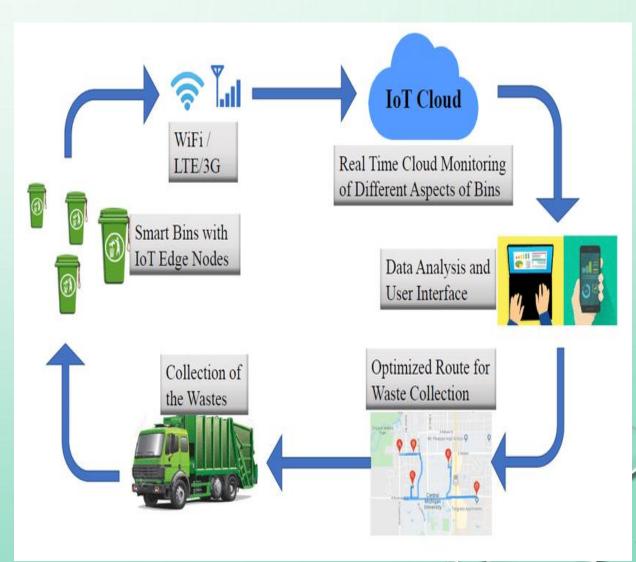
- > Hazardous waste management Best handling practices for with the hazardous waste include; risk associated
- improper disposal of hazardous Identify and classify waste include:
- Water pollution
- Climate change
- Air pollution
- Animal and marine death
- Plant death
- hazardous \_ Radiation and material poisoning (e.g. lead)

- waste materials
- Label and store waste properly
- Choose a reputable waste transporter and facility
- Train staff on the proper ways of handling hazardous waste.
- Review and improve your waste management plan

# TECHNOLOGY AND WASTE MANAGEMENT



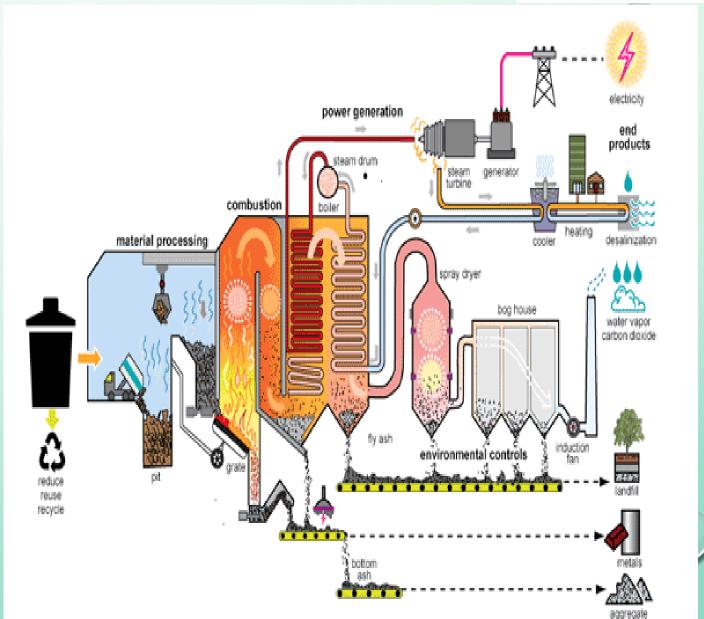
- Innovations in waste management are;
- Smart waste bins
- Waste level sensors
- Al recycling robots
- Garbage truck weighing mechanism
- Pneumatic waste pipes
- Solar-powered trash compactors
- E- waste kiosks
- Recycling apps.



# TECHNOLOGY AND WASTE MANAGEMENT



- Some waste to energy organizations in Nigeria are;
- RecyclePoints, Lagos [2012]
   (Incentive based recyclable waste collection system)
- High Collar Sustainable Solutions Limited, Kaduna [2022] (Uses food waste from community as source of biogas)
- McFadic Energy Group, Port Harcourt [2023]
   (Production of carbon-free cooling-and-power-generation facilities powered by waste-heat.)



# BENEFITS OF PROPER WASTE MANAGEMENT



- Reduces pollution
- Prevents flooding
- Creates jobs
- Conserves resources
- Promotes public health



# COMMUNITY ENGAGEMENT



- Educating the community on the process of waste management is important in the following ways;
- Increase knowledge and awareness of the causes and consequences of waste problems.
- The potential solutions and benefits of waste reduction, reuse, and recycling.
- Enhance the motivation and commitment of people to adopt sustainable waste practices and behaviors thereby avoiding littering.
- Improve the collaboration and coordination among different stakeholders, such as local authorities, waste collectors, NGOs, and businesses.
- Foster social cohesion, trust, and equity among community members.

# COMMUNITY ENGAGEMENT



> Examples of community engagement activities



Cataunidos network in Brazil Organizing Waste Pickers



Umande Trust in Kenya Organizing Community Led Sanitation Project (Convertion of Human Waste to Biogas)



Morit International School in Ajegunle, Lagos accepts Plastic Bottles as School Fees.



- Nigeria doesn't have any law that deals specifically with flood management but the following touch flood management in a little way;
- The National Emergency Management Agency Act
- The River Basin Development Authorities Act
- National Environmental Standards and Regulation Enforcement Agency (Establishment) Act 2007
- National Hydrological Services Agency (Est. Act) NIHSA/2010
- Nigerian Meteorological Agency (Est. Act) NIMET Act
- National Environmental Policy 1999
- National Erosion and Flood Control Policy (NEFCP/2005)





The National Emergency Management Agency Act – The mission of this agency is to coordinate resources towards efficient and effective disaster prevention, preparedness, mitigation and response in Nigeria.

The functions of the Agency in relation to flood include;

- a. Educating and informing the public on disaster prevention and control measures.
- b. Distribute emergency relief materials to victims of natural or other disaster and assist in rehabilitation of the victims where necessary.
- c. Liaise with the united Nations Disaster Reduction Organization or such other International bodies for the reduction of natural and other disasters.





National Hydrological Services Agency Act (AFIHSA) – This Agency was established in 2003 with the vision of providing weather, climate and water information & services for sustainable development & safety of lives and property.

The main function of the Agency that touches on flood is update the common Nigeria citizens on weather forecasts and predictions. This aids some decision making, reducing serious cases of accidents due to weather – related mishaps, of which flood is part off.





- Nigerian statutory provisions for environmental protection and waste management are;
- National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations of 1991
- Section 20 of the Constitution of the Federal Republic of Nigeria
- The National Environmental Standards Regulation Enforcement Agency Act, 2007 (NESREA)
- The Harmful Waste (special criminal provision) Act of 1988



- The direct law in Nigeria regulating solid waste management is National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations of 1991. It regulates the collection, treatment and disposal of solid (and hazardous) waste from municipal and industrial sources. The objectives of solid waste management include;
- Identification of solid, toxic and extremely hazardous waste dangerous to public health and the environment.
- Provision of surveillance and monitoring of extremely hazardous waste
   (and substances) until the are detoxified and safely disposed of.







- Provision of guidelines for proper record keeping (sampling and labelling) of extremely hazardous waste.
- Establishment and provision of suitable requirements necessary to facilitate disposal of hazardous waste.
- Carry out research into possible re-use recycling of hazardous waste.
- Challenges affecting the implementation of the stated objectives are;
- Non availability of fund to the agency.
- Inadequate qualified man power.
- Lack of functional equipment and laboratories.
- Corruption
- Inadequate sanctions.



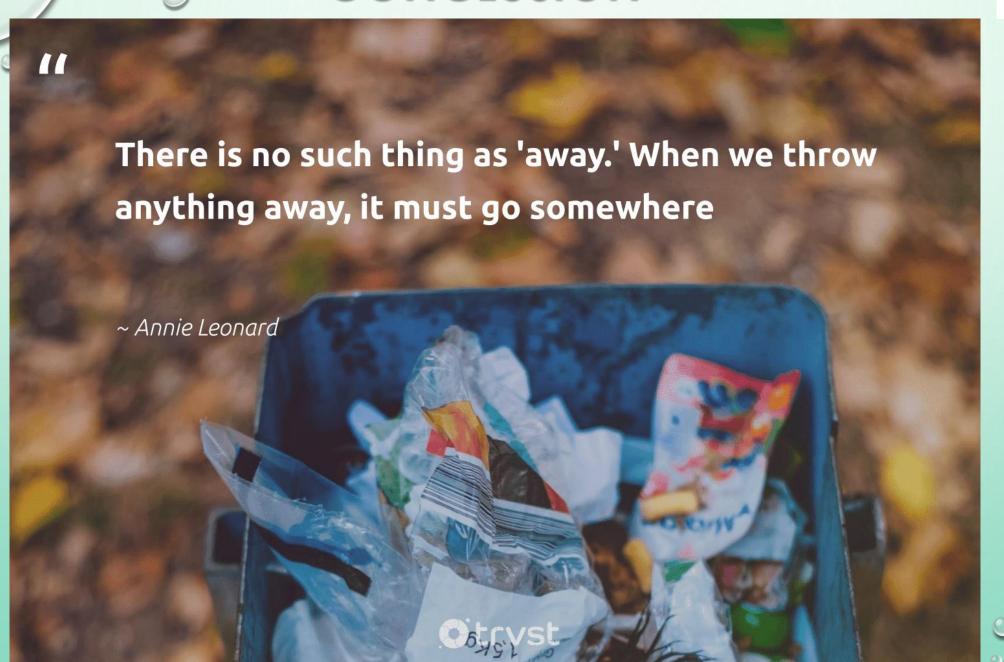
# SOLUTION TO ENVIRONMENTAL FLOODING AND POOR WASTE MANAGEMENT



- Environmental flooding and poor waste management can be reduced to the minimum level by;
- Dump waste in the appropriate dump sit and not on the road.
- Recycle hazardous waste by taking it to a waste treatment facility.
- Use grass clippings as a source of compost manure in gardens.
- Practice environmental education of individuals to create awareness on the importance of proper waste management.
- Plant trees to reduce the effect of global warming and environmental degradation.

# CONCLUSION











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