INTEGRATED APPROACH TO URBAN FLOOD ADAPTATION IN THE NIGER DELTA COAST OF NIGERIA

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ABSTRACT

- The paper highlights the physical, social, economic, technical and institutional dimensions of urban flooding
- Delineated flood-prone areas.
- Observed spatial shifts in flood areas .
- Documented data used were supported by field observations; the Arc View GIS 3.3 was used to produce the flood-prone areas and elevations and map
- spatial shift in the location of flooded areas were identified,
- the inadequacy of urbanization process, coupled with the phase of urbanization were responsible for the current flood problems in areas not designated as prone.
- Urban master planning became imperative for flood prevention and remedial action.
- The unified urban flood management /planning concept was advocated to facilitate adaptation, and integrated floods management design was illustrated and recommended.

INTRODUCTION

- Flood hazards are natural, but human modification of landscape and attenuation nature's right-of-way can accentuate the problem or
- create the problem in areas not naturally prone
- Effects dependent on extent of development and human occupancy of vulnerable areas

Dimensions of urban flooding

- Differs from rural flooding as it involves both bank full discharges and infiltration excess overland flow.
- Consequences usually more monumental because of characteristic increasing concentration of production and population, coupled with concentration of wastes and associated environmental and health problems
- Appears to be accelerating in coastal cities of the Niger Delta, Nigeria, with complex explanation that requires holistic approach to stem the tide

FLOODING IN NIGER DELTA

- A common and recurrent phenomenon
- Identified by Zabbey(2007) to include riverine urban flooding
- Major causes include high rainfall regime and low lying elevation, hence coastal flooding from the sea
- Affects settlements significantly because of high concentration of activities

FLOODING IN PORT HARCOURT

- The largest and the most urbanized city
- Flood mainly caused by high rainfall and in areas of close proximity to flood plains of the Niger distributaries (see fig 1)
- The most common dimensions of flooding being Riverine flooding in river floodplains settlements

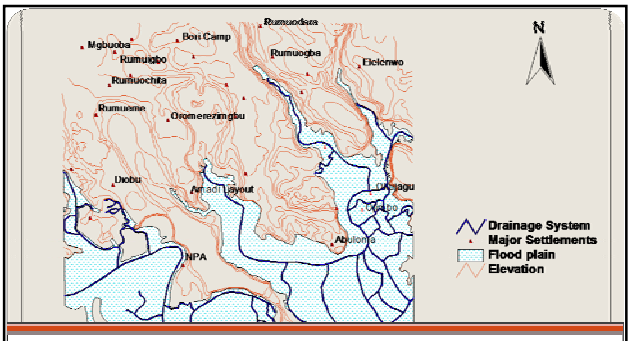


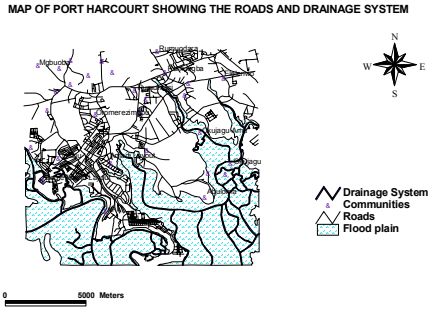
Fig 1: Map showing Flood Prone Areas

Other dimensions

- Spatial shift currently to less envisaged areas, thus:
- Pondages in construction sites, deforested relatively flat terrain
- Inundation in congested areas
- Over flow from blocked drains and traffic obstruction

Causes of recent flooding in Port Harcourt

- Reports of flooding attributed mainly to high rainfall.
- Little attention is given to human attenuation of the landscape which inhibits infiltration
- Initial stage of urbanization, inadequate planning and inappropriate development are some other contending dimensions for the existing problems



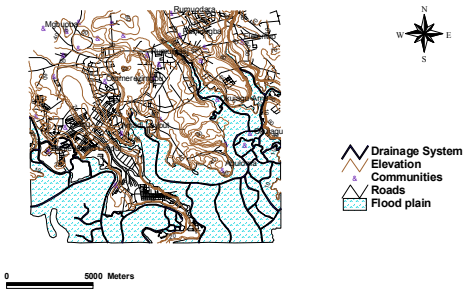
IMPLICATIONS FOR DEVELOPMENT PLANNING

- Rainfall is the first presage of flooding, but lack of adherence to standards as well as inadvertent activities are very compelling
- Increasing occupation of flood-prone areas and congested housing makes flooding appear to be increasing
- The occupants are mainly the poor and low income group

Other implications

- The need for planning and development that integrates climate and the social dimensions
- The need to change our perception and analytical framework
- The new paradigm should be towards both hazard and vulnerability analysis

MAP OF PORT HARCOURT SHOWING THE RELIEF, ROADS AND DRAINAGE SYSTEM



INTEGRATED PLANNING FOR URBAN FLOOD ADAPTATION IN THE COASTAL CITY OF PORT HARCOURT

- This is mainly a policy driven action
- Harmonizes environment and development , with specific thrust on the welfare of the urban poor.
- A unified approach which incorporates an array of urban flood management activities, including:

Other components of the model

- Designing and implementation of land and water use activity zoning and sitting policy
- Contingency plan for human induced and natural flood disasters
- Conservation and restoration of critical habitats such as mangroves (wetlands) and riparian vegetation

Other activities

- Human resource development and training in skills for emergency actions in case of disasters.
- Public education awareness and information for preparedness and emergency action.

Activities involved

- Integration of all sectors of urban development with spatial planning
- Integrating necessary institutional, financial and legislature framework
- The need for master planning and strict adherence

Conceptual framework for urban flood adaptation

- Adopts a systems approach, with both structural and non-structural elements
- All must be integrated for proper urban flood management
- It is linked to the unified model developed after Andejelkovic (2001)

Critical issues in the framework

- The model emphasizes the incorporation of structural measures with emergency response, flood preparedness, legislature, financing and EIA measures
- Also flood recovery measures e.g insurance financial assistance rehabilitation etc

Other considerations in this paper

- This paper emphasizes the harmonization of these and
- the consideration of technical, economic socio-cultural, policy, legal and political framework of the society
- Involvement of all stakeholders, such as public and private sector, NGOs/CBOs research institutions
- All these are captured in fig 4

CONCLUSION

- Port Harcourt flooding appears to be increasing in space-time dimensions because of development
- Floods cannot be prevented out rightly, but good planning and observance of the rules can reduce the level of vulnerability and facilitate coping.
- Traditional measures to reduce flood damages are mainly structural, but urban flood adaptation involves a variety of additional pre- and post-flood measures which are based on non-structural and recovery measures

Integrated urban flood management model