Natural Disasters of Ghana

by

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Presentation Outline

• Background of Ghana
• Types of Disasters in Ghana
• Case Studies on Natural Disasters
• The Way Forward
• Conclusion
Background of Ghana

- **Population**: 27.3 million
- **Capital**: Accra
- **Area**: 238,533 sq km
Types of Disasters in Ghana

Ghana has suffered some disasters both natural and manmade. These include:

• Geological disasters (earthquakes, landslide, land and sea erosion etc)
• Hydro-meteorological disasters (floods, droughts, etc)
• Pest and Insect Infestation (army worm, anthrax, African Swine fever etc)
Types of Disasters in Ghana

• Fires and Lightning (wild fires, etc)
• Disease Epidemics (cholera, CSM, etc)
• Man-Made (marine, road air, rail, accidents, oil spillage, nuclear/radiological and accidents etc.)
Types of Disasters in Ghana

Distribution of natural disasters:
(1900-2005, by decades)

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<td>28</td>
<td>72</td>
<td>56</td>
<td>72</td>
<td>120</td>
<td>232</td>
<td>463</td>
<td>776</td>
<td>1,498</td>
<td>2,034</td>
<td>2,135</td>
<td>7,486</td>
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<td>Geological</td>
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<td>28</td>
<td>33</td>
<td>37</td>
<td>52</td>
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<td>124</td>
<td>232</td>
<td>325</td>
<td>233</td>
<td>1,252</td>
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<tr>
<td>Biological</td>
<td>5</td>
<td>7</td>
<td>10</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>37</td>
<td>64</td>
<td>170</td>
<td>361</td>
<td>420</td>
<td>1,083</td>
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<td>Total</td>
<td>73</td>
<td>107</td>
<td>99</td>
<td>112</td>
<td>176</td>
<td>294</td>
<td>588</td>
<td>964</td>
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<td>2,720</td>
<td>2,788</td>
<td>9,821</td>
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Coastal Erosion & Inundation in Ghana

• In Ghana coastal erosion and flooding have become big environmental problems for coastal settlements

Impacts include:

• Destruction of infrastructure
• Loss of land – migration causes conflicts of land ownership
• Lost of properties due to coastal inundation etc
• Issues regarding safety/vulnerability
Coastal Inundation/Floods

Types of Floods

- Tidal Floods – High tidal waves
- Rainfall – High rainfall intensity
Case Studies – Coastal Erosion & Inundation at Ada Foah

Fig. 1 A section of the eastern coastline of Ghana showing the study area.
Case Studies – Coastal Erosion & Inundation at Ada Foah

• Shoreline change analysis between 1926 and 2008 – DSAS 4.2.

• Mean shoreline change = 280.49 m & average annual rate of 3.46 m/year.
Case Studies – Coastal Erosion & Inundation at Ada Foah

Effects - destruction of coastal ecosystems, homes & infrastructure (offices of institutions, school blocks & roads).

Case Studies – Coastal Erosion & Inundation at Ada Foah

Impacts - homelessness, unemployment, poverty, migration of youth to Accra and families to other communities which causes land ownership conflicts.

Fig. 4 Dilapidated structure of an old police station at Ada Foah
Case Studies – Coastal Erosion & Inundation at Ada Foah

- Publication – Natural Hazards Journal

Sea erosion at Ada Foah: assessment of impacts and proposed mitigation measures

John Manyimadin Kusimi & James Lawer Dika

Natural Hazards
Journal of the International Society for the Prevention and Mitigation of Natural Hazards

ISSN 0921-030X
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Number 2

Nat Hazards (2012) 64:983-997
DOI 10.1007/s11069-012-0216-3
Coastal Erosion & Inundation along the shore of the Densu Delta
Coastal Erosion & Inundation along the shore of the Densu Delta

- Shoreline change analysis between 1975 and 2018 – DSAS 4.2.
- Coastal recession ranged between 0.1 - 150m whiles accretion ranged between 1.6 – 16.6 m.

Fig. a) Digitized shorelines of 1975, 1996 and 2008.
   b) Appended shorelines, transects and baseline for shoreline change calculation.
Coastal Erosion & Inundation along the shore of the Densu Delta

- Shoreline Recession

Eroded coastline at Gbegbeyise
Hydro-meteorological Hazards of Ghana

Floods – inland flooding

- Inland flooding is the major hazard facing Ghana especially urban floods – informal settlements.
- Most towns and cities are prone to floods and in the cities virtually every rain causes floods in the informal settlements.
Hydro-meteorological Hazards of Ghana

Distribution in percentage of natural disasters: (1900-2005), by decades
Hydro-meteorological Hazards of Ghana

Floods – inland flooding

Causes of inland floods:

• Climate change – storm intensity & frequency
Hydro-meteorological Hazards of Ghana

Floods – inland flooding

Causes of inland floods:

- Urban growth/Urban Sprawl
  - occupation of floodplains
  - Reduction of infiltration from impervious surfaces
Hydro-meteorological Hazards of Ghana

Floods – inland flooding

Causes of inland floods:

• Lack of good drainage systems – informal settlements
• Poor waste management – particularly solid
Flood occurrence and impacts

Impacts include:
• Lost of lives and properties

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<tbody>
<tr>
<td>No. of people affected</td>
<td>2,800</td>
<td>2million</td>
<td>700,000</td>
<td>144,025</td>
<td>332,600</td>
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<tr>
<th>Year</th>
<th>1995</th>
<th>1999</th>
<th>2007</th>
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<tr>
<td>No. of people killed</td>
<td>145</td>
<td>52</td>
<td>56</td>
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Flood occurrence and impacts

Impacts include:

• Food in-security in the country side (destruction of farms and livestock)

Relief being distributed to flood victims
Flood occurrence and impacts

Impacts include:

• Water pollution – waste into surface water bodies, disconnection of pipe lines
• Outbreak of epidemics e.g. cholera, dysentery – health hazards
Flood occurrence and impacts

Impacts include:

• Destruction of infrastructure both urban & in the hinterland – roads, bridges etc
Case study: Flooding in Alajo - Accra

Causes

- Situated in a floodplain of Odaw River
Case study: Flooding in Alajo - Accra

Causes

• Siltation of drains (reduce drains carry capacity) and clayey soils (reduce infiltration)
Case study: Flooding in Alajo - Accra

Causes

- Improper buildings layouts resulting in lack of drainage systems
Case study: Flooding in Alajo - Accra

Causes

• improper waste management and disposal-choked drains
Biological Hazards

• Pests and insects infestation (army worm, anthrax, African Swine fever, bird flu etc) – affects food security and income of farmers
The Way Forward

• Flood hazards assessment on riparian zones in the hinterland to investigate food security impacts
• Flood modelling and prediction
• Coastal erosion modelling
• To encourage data gathering, preparation of hazards/risk maps and sensitization on natural hazards
• Inform national policies on hazards prevention & management
THANK U