Operationalizing Disaster Management Training Programmes in Developing Countries Universities.

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No. of students: 52000
Regular: 17000
Distance Education: 35000

Mandate of the University
• Teaching
• Research
• Outreach
Ghana
Background

Major incidence of disasters in Ghana is from

• Floods,
• Earthquakes
• Landslides
• epidemics,
• fire,
• pests and diseases
• and conflicts.
Research on Risk Assessment

• Participatory Approach
• Models: Hydrological, Statistical
• Image Processes
Participatory GIS Mapping

SHAMA SHORELINE CLASSIFICATION

Legend
- Settlement
- Road
- Water Body
- Marsh / Mangrove

Shoreline Classification
- Fine Sandy Beach
- Partially Submerged Rocks backed by Coarse Sandy Beach
- Partially Submerged Rocks backed by Fine Sandy Beach
- Rocky Beach
- Sea Defence (Harden Shoreline)
Table 1.2 Flood Risk Zone Coverage (Source: Figure 1.7)

<table>
<thead>
<tr>
<th>Flood Intensities</th>
<th>Area (m²)</th>
<th>%</th>
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<tbody>
<tr>
<td>Low</td>
<td>2269185000</td>
<td>26.85</td>
</tr>
<tr>
<td>Medium</td>
<td>2652485000</td>
<td>31.39</td>
</tr>
<tr>
<td>High</td>
<td>3012897500</td>
<td>35.66</td>
</tr>
<tr>
<td>Very high</td>
<td>515355000</td>
<td>6.10</td>
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Table 1.2 shows areas that fall within the very high flood risk zone covering about 6.09 percent of the study area. However, the combination of the very high and high-risk zones constitutes a total of 41.74 percent of the entire study area. Hence, the area coverage of the flood risk zone will expand if the rainfall intensity increases above 140.2 mm/day.

SUMMARY AND CONCLUSION

To determine flood risk zones in Accra and its environs, a hydrological model (modified rational model) was integrated into the GIS platform through the arithmetic overlay operation method using operators such as addition and division. The results show that the delineated areas experience the same rainfall intensity of 140.2 mm, yet the flood intensities of these areas differ. For instance, the high flood risk zone covers 35.66 percent of the study area, while the low risk zone covers 26.85 percent.

Modified Rational Model operationalized within a GIS Platform (ILWIS)
FLOOD MAPPING

- Landuse Map
- Map of BuiltUp Areas
- DEM
- Road & Stream Network Map
- Spatial Distribution of Manning’s Coefficient \( n \)
- Hydrodynamic Model – SOBEK 1D2D
- Discharge Data HQ
  \( =2, 5, 10, 25, 50, 100, 200 \)
- Meteorological Data
- Cross sectional Data
- Extent, Depth, Velocity
- Flood Inundation Map
FLOOD RISK AREAS

Legend
Flood Risk Areas
- High Risk
- Medium Risk
- Low Risk

Flood Warning Time Inchaban Catchment

Legend
Flood Warning Time (Hours)
- 0 - 4
- 4.1 - 13
- 13.1 - 21
- 21.1 - 28
- 28.1 - 34

Gulf of Guinea

Projected Coordinate System UTM Zone 30N
Spheroid: WGS84
Units: Meters
Use of Filters to Identify Geological Lineaments

Buffer constructed around the settlements
Corporate Strategic Plan

- UCC Corporate Strategy Trust 3, 2006, p.12

- University, which tasks Departments/Units/Institutes to vigorously pursue distance education, develop new and relevant programmes and periodically review existing ones.
SANDWICH COURSE
DISASTER MANAGEMENT

• The specific objectives are to:
  – Provide opportunities for persons involved in disaster management to up-grade their knowledge and skills;
  – Contribute to the development of a body of knowledge on issues of hazards/disasters and their prevention and management; and
  – Collaborate with agencies involved in disaster/hazard management to develop continuing education and research agenda in the area.
Target Group

- Administrative; Mining, electrical, civil and mechanical engineers; forestry and related personnel;
- Personnel from the Ghana Armed Forces, the Police Service, Fire Service, Prisons Service, Immigration Service, Customs, Excise and Prevention Service (CEPS), industries, Ministry of Health (MOH), Non-governmental Organizations (NGOs), the Environmental Protection Agency (EPA) and the National Disaster Management Organization (NADMO), District Assemblies
Courses Content

- DMS 501: Environmental Resource Management and Policy
- DMS 502: Concepts and Models in Environmental Risks and Hazards
- DMS 503: Research Methods
- DMS 504: Environmental Degradation and Remedies
- DMS 505: Remote Sensing and Geographic Information Systems (GIS)
- DMS 506: Vulnerability and Risk Assessment
- DMS 507: Disaster Preparedness Planning and Education
- DMS 508: Environmental Law and Policy
- DMS 509: Quantitative and Statistical Methods
- DMS 510: Geo Hazards and Image Interpretation
- DMS 511: Operational Issues in Risk Assessment & Disaster Management
- DMS 512: Fieldwork and Seminars
- DMS 599: Dissertation/Project
DMS 802S: CONCEPTS AND MODELS IN DISASTER RISK AND HAZARDS

**Instructor:** Dr. Benjamin Kofi Nyarko and Mr Emmanuel A. Mensah

**Class Schedule:** Refer to Timetable

**Office:** Dept of Geography & Regional Planning, Room # 226

**Course Description:** The 3 credit hour course focuses on relevant concepts and models underlying disaster risk management. Stages in the disaster risk management cycle and international initiatives such as the Hyogo framework for disaster risk management as well as paradigms in vulnerability assessments will be examined. Strategies for disaster risk mitigation and response planning at various levels of administration will also be examined.

**Course Schedule:**

<table>
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<tr>
<th>WEEK #</th>
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| 1      | Definition, importance and characteristics of a model  
         |   - Model development  
         |   - Types of models-Conceptual, analytical etc |
| 2      | System Concept and system thinking |
| 3      | Understanding the Concept disaster, Risk and Hazard  
         | Disasters and sustainable Development. Socio economic impact of disasters. |
| 4      | Models in Risk Assessment  
         | Definition, characteristics and classification of Hazards  
         | Analysis of selected Hazards |
| 5      | Theoretical Approaches to vulnerability |
| 6      | Participatory GIS for disaster risk assessment |
| 7      | Models in Disaster Mitigation and Preparedness Planning |
| 8      | Review of concepts |

**Assessment:**

Evaluation is based on:
- Assignment: 10 Marks
- Quiz: 20 Marks
- Field Exercise: 10 Marks
WAY FORWARD

- Tailored Made Courses
- Data gathering
  - Use of WIFI’s System
  - Micro systems for data gathering (Using Raspberry Pi)
  - Community NADMO Groups
- University of Cape Coast
  - Laser and Fibre Optic Centre
  - Computer Science
  - Cape Coast Polytechnics
Co-operation

• Curriculum Review
• Modular Programme
• Upgrade of Faculty in emerging spatial techniques
• Studios for practical Works
Thank You