The Increasing Threat of Natural Hazards in Central Africa: The Case of Urban Megagullies

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• Introduction to the Natural Disasters Database & results
• Case Study: Kinshasa
• Prevention & Mitigation
• Conclusion
INTRODUCTION

Why a database??

Importance
• High frequency smaller events = great cumulative impact
• Large events - eg. flooding Congo river 1940-41; 1960-61

Public Awareness!!
- Research
- Hazard mapping…

Flooding in Ubundu (Tshopo, DRC), 1940s.
Source: Posted on Google Earth
Natural Hazards

Extraterrestrial
- Meteorite impact
- Ice ages

Biological
- Epidemic
- Insect Infestation

Climatological/
Meteorological
- Extreme temperature
- Drought
- Storms

Geomorphological
- Volcanic Activity
- Seismic Activity

Mass Movements
- Rockfall
- Avalanches
- Landslide/Mudflow
- Soil Creep
- Erosion

Hydrometeorological
- Flooding
- Extreme fluctuations in water table levels
Natural Factors

• Topography
• Lithology and soil type
• Precipitation & river regime
• Tectonic activity

Anthropogenic Factors

• Land use
• Urbanisation
• Deforestation

Musaga Landslides, Bujumbura, Burundi
- Disaster ID
- Location
- Hazard type
- Start & End date
- Number of people affected
- Number of people killed
- Structural damage
- Source

All Natural hazards in Rwanda, Burundi, DRC since 1900

**Sources:** Scientific articles, NGO reports, News agencies, CRED Databank, Personal communication

Flooding, Bigogwe, Rwanda
RESULTS

Since 1900: 730 recorded events

>12.2 million people affected

~ 2000 deaths

Landslide in Kilimani Refugee Camp, Masisi (North Kivu, DRC) 4 February 2009; 3 injured, 8 killed, dozens of houses destroyed

Source: Doctors without borders, Reliefweb
Volcanic Activity
Virunga Range

Seismic Activity
Albertine Rift

Droughts
Burundi, Southern Rwanda

Floods
Concentration in Rwanda, Burundi & major cities

Storms
Tropical zone

Landslides
~ topography, land use

Gully erosion
~ topography, land use
The Natural Hazards Database ONLINE:

http://www.africamuseum.be/collections/browsecollections/naturalsciences/earth/hazard

Natural Hazards Database in Central Africa

Search

Welcome to the Natural Hazards Databank for Central Africa! We provide up-to-date and as complete as possible information on natural hazards having occurred in Rwanda, Burundi and the Democratic Republic of Congo since 1900.

This databank is a work in progress, and does not claim to be an exhaustive list. If there are any errors in the data provided, or if you have information you wish to share on events not yet included in the databank, please do not hesitate to contact us, your name will of course be added as a source of information.

Hazard type:

Country:

Province:

Year:  (ex: 1956)  Period:  years

Keywords:

Search
## Disaster Analysis

This page from [African Museum](http://www.africamuseum.be/collections/browse_collections/naturalsciences/earth/hazard) presents a map illustrating the locations of natural hazards across Africa. The map highlights various regions affected by floods, droughts, earthquakes, landslides, storms, and volcanic eruptions. Each event is marked with a red pin, indicating the specific location. Below the map, a table summarizes the details of these events:

<table>
<thead>
<tr>
<th>Disaster ID</th>
<th>Hazard</th>
<th>Country</th>
<th>Province</th>
<th>Location</th>
<th>Begin date</th>
<th>End date</th>
<th>Persons affected</th>
<th>Persons killed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962_A_BDI</td>
<td>Flood</td>
<td>Burundi</td>
<td>Bujumbura Ville</td>
<td>Bujumbura</td>
<td>1962</td>
<td>1962</td>
<td>3600</td>
<td>12</td>
</tr>
<tr>
<td>1989_32_BDI</td>
<td>Flood</td>
<td>Burundi</td>
<td>Bujumbura Ville</td>
<td>Bujumbura</td>
<td>1989/2/2</td>
<td>1989/2/2</td>
<td>3600</td>
<td>12</td>
</tr>
<tr>
<td>2002_275_BDI</td>
<td>Flood</td>
<td>Burundi</td>
<td>Bujumbura Rural</td>
<td>Bujumbura</td>
<td>2002/5/6</td>
<td>2002/5/6</td>
<td>6000</td>
<td>12</td>
</tr>
<tr>
<td>2002_275_BDI</td>
<td>Flood</td>
<td>Burundi</td>
<td>Bujumbura</td>
<td>Bujumbura</td>
<td>2002/5/6</td>
<td>2002/5/6</td>
<td>6000</td>
<td>12</td>
</tr>
</tbody>
</table>

This analysis provides a comprehensive view of the distribution and impact of natural disasters across the African continent.
Urban extent of Kinshasa 1957-2007

1957
94,2 km²
299 800 hab.

2007
442,7 km²
7 500 000 hab.

Urban extent of Kinshasa 1957-2007
Gully erosion in Kinshasa 2007
307 gullies - 209 active & 98 ‘stabilised’
Average width 22,5 m; depth 8 m

94,5 km total length
(almost Johannesburg to Rustenburg!)

2 km² total surface area lost
(Monaco!)
Since 1957, an estimated 4725 houses have been destroyed:

= over $60 million in property losses alone!
• Ravins Mataba I & II, Quartier Binza Delvaux