# The Role of Institutes of Higher Learning in National and Provincial Preparedness in SA

Building Resilience through Education, Research and Community Engagement

#### **Education & Training**

Developing skilled professionals for disaster preparedness and response

#### **Community Engagement**

Bridging divides to reach vulnerable populations affected by disasters

#### **Research & Innovation**

Generating critical knowledge for South Africa's unique hazard landscape

#### **Strategic Partnerships**

Collaborating with government and private sector for holistic preparedness

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## Introduction: South Africa's Unique Preparedness Landscape



#### **Distinctive Hazards**



#### **Recurrent Floods**

South Africa experiences frequent flooding, particularly in KwaZulu-Natal and other coastal regions, causing significant disruption to communities and infrastructure.



#### **Prolonged Droughts**

The nation faces severe water shortages, with the "Day Zero" water crisis in Cape Town highlighting the vulnerability of urban water systems.

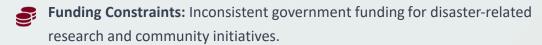


#### **Social Unrest**

The legacy of apartheid and ongoing socio-economic inequality creates persistent challenges for preparedness efforts and community engagement.



#### **IHL Context-Specific Challenges**



**Policy-Practice Gap:** Barriers in translating academic research into actionable policy recommendations.

**Socio-Economic Divide:** Disconnection between universities in urban centers and vulnerable rural communities.



#### **IHL Adaptation Requirements**

South African IHLs must develop context-specific approaches that effectively bridge academic expertise with practical application, while addressing both natural hazards and social vulnerabilities.

## **Education and Training: Building South African Expertise**



#### **Formal Curriculum**

#### **Potential Specialized Programs**

- ✓ Natural Hazards Resilience
- Disaster Medicine vs Disaster Management
- Early Warning Systems Development

#### **Unique Features**

- Integration with local hazard context
- Industry partnerships for practical skills
- Community engagement components



## **Specialized Training**

#### **Collaborative Programs**

DUT, UKZN, Local Training Centres

- Build online training over a few weeks
- Hybrid online / in-person training programs for crossdisciplinary role-players

#### **Learning Objectives**

- Foundations of Disaster Research
- Reciprocity and Research Communications
- Disaster Research Methods and Tools



#### **Public Awareness**

#### **Community Resilience**

Develop education programs for vulnerable communities in collaboration with

- **②**
- Focus on water crisis preparedness

#### **Lifelong Learning**

- Continuous education initiatives (CPD)
- Information exchange between universities and disaster agencies
- Focus on vulnerable populations

## **Research and Innovation: South African Solutions**

South African universities serve as critical centers for research and innovation, generating knowledge specific to the country's unique hazard landscape and developing solutions tailored to local contexts.



#### **Climate Change Adaptation**

Developing strategies and models to help communities adapt to increased frequency of droughts and floods.

**Example:** UCT's Climate System Analysis Group (CSAG) providing climate projections and seasonal forecasts for the Western Cape's response to the "Day Zero" water crisis.



#### **Public Health Epidemiology**

Investigating disease patterns and outbreaks, crucial for preparing for and responding to public health emergencies.

**Example:** UKZN's global leadership in HIV/AIDS research and rapid mobilization during COVID-19 pandemic, conducting real-time epidemiological surveillance and supporting vaccination campaigns.



#### **Urban Flood Modeling**

Creating predictive models for flood events in urban areas, aiding in early warning systems and infrastructure planning.

**Example:** CSAG's work on urban flood modeling to improve early warning systems and infrastructure planning in flood-prone areas.



#### **Social Vulnerability Mapping**

Identifying and mapping communities most vulnerable to disasters, allowing for targeted interventions and resource allocation.

**Example:** UKZN's work on community engagement in COVID-19 response, implementing community-based health education programs and supporting vaccination campaigns in underserved communities.

## **Operational Support: Resources During Public Health Emergencies**



#### **Facilities**

- feneral shelters for affected populations
- Medical needs shelters with essential services
- Sites for emergency operations centers (EOCs)
- Staging areas for emergency personnel and equipment



#### **Personnel**

- Campus police and public safety officers
- Medical faculty and nursing staff
- Student volunteers from public health programs
- Law enforcement and social work students



#### Equipment

Specialized radios for emergency communication

- Internet access points for situational awareness
- Cameras and recording equipment
- Geographic Information Systems (GIS) and GPS mapping



#### **Specialized Services**

Medical needs assessments

Care coordination for affected populations

- Counseling and psychosocial first aid
- Specialized advice tailored to local contexts



## Strategic Partnerships: Collaboration in the South African Context





#### **Institutes of Higher Learning**

Research & Education



#### **Government Agencies**

Policy & Implementation



#### **Private Sector**

**Resources & Innovation** 

#### E Formal Collaboration Mechanisms

- Memorandums of Understanding: Binding agreements between IHLs and government/NGOs to collaborate on specific preparedness initiatives.
- ✓ **Joint Research Centers:** Coordinated research institutions that pool resources and expertise to address South Africa's unique hazards.
- Curriculum Partnerships: Integration of preparedness education into academic programs, often in collaboration with government agencies.

### Informal Collaboration Approaches

- Knowledge Exchange Networks: Informal gatherings where IHLs share research findings and best practices with stakeholders.
- Pro bono Expertise: Voluntary technical assistance from university faculty to government and community organizations.
- Community Resilience Coalitions: Bottom-up initiatives where IHLs work with communities to develop localized preparedness strategies.

## **Campus Resilience: South African Universities Leading by Example**

South African Institutes of Higher Learning (IHLs) are implementing comprehensive emergency management plans tailored to local hazards, while serving as models for organizational preparedness and community resilience.



#### **Integrated Risk Management**

Universities developing holistic risk assessment frameworks that identify, evaluate, and mitigate hazards specific to the South African context, including climate change impacts and social vulnerabilities.



#### **Staff and Student Engagement**

Mobilizing campus communities through training programs and volunteer initiatives to enhance disaster preparedness and response capabilities specific to local hazards.



#### **Strategic Partnerships**

Building collaborative relationships with local municipalities, nongovernmental organizations, and the private sector to extend university expertise and resources for community-wide preparedness.



#### **Cultural Adaptation**

Developing context-specific approaches that address both natural hazards and the unique socio-economic challenges faced by vulnerable populations in South Africa.



**Campus Resilience Model:** South African universities are leading by example through proactive hazard identification, community engagement, and innovative preparedness strategies that bridge academic expertise with practical application.

## **Case Studies: UCT and Climate Risk**



#### **University of Cape Town's Climate System Analysis Group (CSAG)**

A pivotal actor in informing the Western Cape's response to the "Day Zero" water crisis



- Provided advanced climate projections
- Offered seasonal forecasts

Source: Hewitson et al., 2014



#### **Risk Data Analysis**

- Analysed hydrological data
- Assessed water resource availability

Source: Ziervogel et al., 2010



#### **Policy Engagement**

- Collaborated with provincial authorities
- Translated climate science into policy

Source: Pasquini & Cowling, 2015



Impact: Averted complete shutdown of municipal water supply

## Future Directions: Strengthening the "Triple Helix"

#### **Emerging Opportunities**



## Knowledge Translation

Strengthening mechanisms to effectively transfer academic insights from IHLs into actionable policies and practices.



## **卓** Inter-University Networks

Fostering robust networks between South African universities to share best practices, research findings, and resources.

## **Advanced Technologies**

Leveraging AI and other emerging technologies to enhance preparedness efforts and extend reach to vulnerable populations.



## **202** Community Engagement

Developing culturally sensitive approaches to effectively engage with and empower vulnerable communities affected by disasters.