Stakeholder Engagement to Re-Energize Disaster Risk Reduction and Resilience (DR³) for Advanced Data Processes

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www.govdisasters.com
Project Profile: **Re-Energize DR3**

Re-Energize Governance of Disaster Risk Reduction and Resilience for Sustainable Development

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[www.govdisasters.com](http://www.govdisasters.com)  
[www.islandslaboratory.com](http://www.islandslaboratory.com)
“Collaborative Research Action on Disaster Risk Reduction and Resilience through the Belmont Forum”

4 Funding Agencies: UKRI (EPSRC), QNRF, NSF, JST
GU & UoM receiving funding under UCL (UKRI)

3 Disaster Types: Floods, Drought, Heatwaves
2 Case Study Types: Coastal Cities & Islands
7 Nations in 4 Continents:
UK, Ghana, Mauritius, Qatar, USA, Italy, Japan
32 Researchers
250.9 person-months
26 Supporting Institutions

https://www.govdisasters.com
Which disasters?

Number of people affected by disaster type (1994-2013) (NB: deaths are excluded from the total affected)
Re-Energize DR3 Governance Toolbox
Multilevel Governance for Equitable DR3
# DR3 Balanced Scorecard: UK vs. US

**Anticipation**
- Finance
- Process
- Beneficiaries
- Learning and Innovation

**Prevention**
- Finance
- Process
- Beneficiaries
- Learning and Innovation

**Preparation**
- Finance
- Process
- Beneficiaries
- Learning and Innovation

**Response**
- Finance
- Process
- Beneficiaries
- Learning and Innovation

**Recovery**
- Finance
- Process
- Beneficiaries
- Learning and Innovation

## PERIOD
- Finance
- Process
- Learning and Innovation
- Beneficiaries

**Balanced Scorecard**

<table>
<thead>
<tr>
<th>Period</th>
<th>Response</th>
<th>Recovery</th>
<th>Mitigation</th>
<th>Preparedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning &amp; Innovation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beneficiaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Example for Stakeholders:

<table>
<thead>
<tr>
<th>Type</th>
<th>Indicator</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>State</td>
<td>Local</td>
<td>FEMA INC EmergCity county</td>
</tr>
</tbody>
</table>

### Example for KPIs:

<table>
<thead>
<tr>
<th>Type</th>
<th>Indicator</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG 11</td>
<td>SDG 12</td>
<td>SDG 13</td>
<td>UNDP</td>
</tr>
</tbody>
</table>

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![Diagram](image.png)
## DR3 Scorecard Indicator Comparison: UK vs. US Approaches

### BALANCED SCORECARD

<table>
<thead>
<tr>
<th>Indicator</th>
<th>UK</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Indicators</td>
<td>455</td>
<td>122</td>
</tr>
<tr>
<td>Finance</td>
<td>96</td>
<td>20</td>
</tr>
<tr>
<td>Process</td>
<td>139</td>
<td>39</td>
</tr>
<tr>
<td>Learning and innovation</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>209</td>
<td>51</td>
</tr>
<tr>
<td>Anticipation</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>Assessment</td>
<td>151</td>
<td>-</td>
</tr>
<tr>
<td>Prevention</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>Preparation</td>
<td>68</td>
<td>-</td>
</tr>
<tr>
<td>Response</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>Recovery</td>
<td>20</td>
<td>44</td>
</tr>
<tr>
<td>Mitigation</td>
<td>-</td>
<td>23</td>
</tr>
<tr>
<td>Preparedness</td>
<td>-</td>
<td>37</td>
</tr>
<tr>
<td>Nexus Related Indicators</td>
<td>119</td>
<td>-</td>
</tr>
</tbody>
</table>

### Global Policy Frameworks

- Climate Change
- Sustainable Development Goals (SDGs) \(^{[1]}\)
- Sendai Framework
- United Nations Development Programme (UNDP)
- SDGs\(^{[1]}\)
- Sendai Framework
- UNDP

### Academic Literature

- 22\(^{[2]}\) UK
- 3\(^{[3]}\) US

### National Grey Literature

- 17\(^{[4]}\) UK
- 0 US

### Tools

- UN/ISDR (2014) Disaster Resilience Scorecard for Cities\(^{[5]}\)
- Community Managed Disaster Risk Reduction (CMDRR)
- Community-Based Disaster Risk Reduction (CBDRR)
- CoBRA’s conceptual model\(^{[6]}\)
- ARUP’s City Resilience Framework\(^{[7]}\)
DR3 Governance DR3 & Balanced Scorecard

Figures Credit: Carvalho P, & Spataru, C  Re-Energize DR3 UCL Balanced Scorecard
Stakeholder Engagement

3 Coastal Cities

6 Island Clusters
DR³ in the US & UK

Kristen Downs, MS
PhD Candidate, Environmental Sciences & Engineering
University of North Carolina at Chapel Hill
Stakeholder Identification & Selection

Theory of Change

Involvement of stakeholders in decision-making creates better-informed decisions that are more likely to garner support and implementation from impacted stakeholder groups and individuals.

Snow Angel Explained: https://youtu.be/OTSn2B_cjCk
# Stakeholder Identification & Selection

- **Identify** stakeholder groups at 3 governance levels
- **Selection Methods**
  - Criterion-i
  - Snowball
- **Workshop development**
  - Questionnaire
  - Workshop meeting
  - 1st 90-min workshop in May

### Workshop 1 Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder Groups</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>~100 invitees</td>
<td></td>
</tr>
<tr>
<td>16 participants</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>2</td>
</tr>
<tr>
<td>Academic</td>
<td>2</td>
</tr>
<tr>
<td>NGO/Volunteer</td>
<td>6</td>
</tr>
<tr>
<td>Business/Industry</td>
<td>2</td>
</tr>
<tr>
<td>Advocacy</td>
<td>3</td>
</tr>
<tr>
<td>Think Tank</td>
<td></td>
</tr>
<tr>
<td>Trade Unions</td>
<td></td>
</tr>
<tr>
<td>Persons with Disability</td>
<td></td>
</tr>
<tr>
<td>Indigenous</td>
<td></td>
</tr>
<tr>
<td>Women’s Group</td>
<td>1</td>
</tr>
<tr>
<td>Children/Youth</td>
<td></td>
</tr>
<tr>
<td>Church</td>
<td></td>
</tr>
<tr>
<td>Fisheries</td>
<td></td>
</tr>
</tbody>
</table>
Stakeholder Engagement

What worked well?
- Smaller groups
- Various engagement styles
- Mix stakeholders w/in groups
- Google Jamboards

What didn’t work?
- Asked a lot of information upfront
- Limited involvement from National level and multiple stakeholder groups
Stakeholder Identification & Selection

1. Criterion-i
2. Snowball
3. Purposeful Random
DR³ in Mauritius

Manta Devi Nowbuth, MSc, PhD

Associate Professor
University of Mauritius
Stakeholder Engagement for DR³ in Mauritius

World Risk Index Ranking
2018 – 16th
2019 – 47th
2020 – 53rd

Vulnerability to severe weather events & natural disasters:

- Cyclones
- Storm & Tidal Surges
- Torrential Rains
- Floods & Flash Floods
- Landslides
- Tsunamis
- Man-induced disasters
  - marine oil spills
Flood Risk Increasing over Time

- **STATUS**
  - Loss of lives: 2009 & 2013
  - Reached up to 297 flood prone sites
  - 48 very high risk flood zones

- **CAUSES**
  - Changes in rainfall patterns
    - high intensity, long duration
  - Increase in impervious areas by 50.5% from 2005 to 2020

- **SOCIO-ECONOMIC LOSSES**
  - Account for up to 20% direct economic losses associated with disasters
  - Damage to people’s homes
  - Damage to infrastructure
  - Loss of livelihoods

“According to the Land Drainage Authority: 297 flood zones and 48 high risk locations listed” in Mauritius (Defimedia June 27, 2021)
Stakeholder Engagement
National Disaster Risk Reduction & Management Center (NDRRMC)

Disaster Risk Management Structure for the Republic of Mauritius

Cabinet

Ministry of Local Government and Disaster Risk Management

Normal Situation

Rodrigues Disaster Risk Reduction and Management Council

National Disaster Risk Reduction and Management Council

Senior Chief Executive
Ministry of Social Security, National Solidarity and Environment and Sustainable Development

Rodrigues Crisis Committee

National Crisis Committee

National Emergency Operations Command (NEOC)

NEOC LEVEL III
NEOC LEVEL II
NEOC LEVEL I

Rodrigues Emergency Operations Command (REOC)

Local Emergency Operations Command (EOC)

(Municipal Mayor / President District Council)

Local Coordinators

LDRRM Committees
(Municipal Mayor / President District Council)

Police Information and Operations Room (PIOR)
(Regional Operations)

District Operations and Coordination Rooms (DCORs)
(Operation Command)

Source: https://ndrrmc.govmu.org/SitePages/Index.asp
Stakeholder Engagement
National Disaster Risk Reduction & Management Center (NDRRMC)

1. National committees regroup
   • Governmental organisations, Private Sector, NGOs and other emergency services

2. Organise workshops and sensitisation campaigns
   • Organisations, Schools, Business, Communities

3. Community Disaster Response Programme
   • Provide training to local inhabitants to empower them during crisis events

4. Organise drills
   • For organisations and with communities living in high risk zones to floods

5. Emergency alerts via mobile apps
   • Reaching out to the general public
Reflections on Stakeholder Engagement

**Strengths**

- Stakeholder engagement process is already in place
- Appropriate legislation to support the system on DRR
  - Strategic and Action Plan to 2030
- After a disaster, main services are operational within 3 days to one week (max)

**Challenges**

- No one left behind
  - People with reduced mobility
- Self-empowerment
  - DRR is a concern for each and every one
- Promote more active involvement of NGOs in the process of DRR
- Consolidate preparedness to disaster
  → review design codes for buildings & infrastructure
  → build resilience
DR³ in Ghana

Yaw Agyeman Boafo, PhD
Research Fellow, Centre for Climate Change & Sustainability Studies
University of Ghana
https://www.ug.edu.gh/c3ss/faculty/dr-yaw-agyeman-boafo
### Disaster Risk in Ghana

<table>
<thead>
<tr>
<th>#</th>
<th>Disaster Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insect &amp; Pest Infestation</td>
<td>Blackfly, armyworm, anthrax, locust, etc.</td>
</tr>
<tr>
<td>2</td>
<td>Diseases &amp; Epidemics</td>
<td>Yellow fever, pandemic influenza, cerebro-spinal meningitis (CSM), cholera</td>
</tr>
<tr>
<td>3</td>
<td>Geological/Nuclear Radiological</td>
<td>Landslide, gas emission, earthquakes, tsunamis</td>
</tr>
<tr>
<td>4</td>
<td>Human-induced/Man-made</td>
<td>Marine and railway emergencies, vehicular and aviation accidents, building collapse</td>
</tr>
<tr>
<td>5</td>
<td>Hydro-meteorological</td>
<td><strong>Floods, windstorm, droughts, rainstorm, tidal waves</strong></td>
</tr>
<tr>
<td>6</td>
<td>Fire &amp; lightning</td>
<td>Lightning, domestic and industrial fires, bush/wildfires</td>
</tr>
</tbody>
</table>

Source: Community Resilience through Early Warning (CREW) project
Magnitude 4.0 earthquake
7 km from Gbawe - 24 Jun, 10:53 pm

Accra after heavy rains, June 2016 🇬🇭
Non-state-level DR³ Actors in Ghana

Legend (Policy Sectors):
- Communication & Information
- Education
- Water & Sanitation
- Health
- Relief & Support
- Housing & Construction
- Transportation
- Multifunctional
- Identified stakeholder
- Stakeholder group in principle

Abbreviations:
ADRA: Adventist Development and Relief Agency
ADKA: Archiectural and Engineering Services Limited
CEB: Community Based Organizations
CFS: Catholic Relief Services
ECOWAS: Economic Community of West African States
FBO: Faith Based Organizations
FEMA: Federal Emergency Management Agency
GIZ: The Deutsche Gesellschaft für Internationale Zusammenarbeit
GHEDA: Ghana Real Estate Developers Association
ICRC: International Committee of the Red Cross
IICA: Japan International Cooperation Agency
UN-Habitat: United Nations Human Settlements
UNHCR: United Nations High Commission for Refugees
USAID: United States Agency for International Development

Media: Includes electronic, radio & television

Local
- World Vision, Ghana
- Media
- Private Schools
- Zoomlion
- GIACS
- Insurance Companies
- Private Health Facilities
- Religious Leaders/groups
- Traditional Authorities
- Slum Union of Ghana
- Opinion Leaders
- Old Fadama Association
- CBOs
- BBOs
- Disaster Volunteer Groups (DMGs)

Regional
- World Vision, Ghana
- Media
- Private Schools
- Zoomlion
- Private Transport Organizations
- GIACS
- Insurance Companies
- Private Health Facilities
- Religious Leaders/groups
- Traditional Authorities
- Slum Union of Ghana
- Opinion Leaders
- Old Fadama Association
- CBOs
- BBOs
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National
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- Zoomlion
- Private Transport Organizations
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- Insurance Companies
- Private Health Facilities
- Religious Leaders/groups
- Traditional Authorities
- Slum Union of Ghana
- Opinion Leaders
- Old Fadama Association
- CBOs
- BBOs
- Disaster Volunteer Groups (DMGs)
Reflections on Stakeholder Engagement in Ghana

- Which types of actors are involved in the disaster risk reduction and resilience (DR³) network in Ghana?

- How are DR³ networks structured in relation to information, knowledge, resource exchange, and trust for sustainable development?
Respondents

Jeb Brugmann Resilient Cities Practice & The Next Practice
Zafar Adeel, PhD Simon Fraser University

Photo Credit: https://www.npr.org/2021/07/01/1012061776/the-deadly-heat-wave-is-triggering-dozens-of-wildfires-in-western-canada
Jeb Brugmann

Founding Principal, Resilient Cities Catalyst

Founding Partner, The Next Practice

Photo Credit: https://www.dezeen.com/2017/09/01/urban-design-caused-hurricane-harvey-disaster-houston-flooding-ilan-kelman-opinion/
Enhancing Resilience Against Floods and Cascading Hazards

Experience from Canada, Mexico, and the United States

Dr. Zafar Adeel

Executive Director, Pacific Water Research Centre
Simon Fraser University
Approaches for Enhanced Resilience

- Incorporation of flood-costing methodology in planning for community resilience
  - Uptake into policies at federal, state/provincial and municipal level
  - Reduce data dissonance

- Communities/regions use the most suitable data and information
  - Improved data and tools to support decision making for flood management at the local and national levels

- Enhanced capacity of local and regional emergency managers
  - Improved information sharing for preparedness and emergency response
Comments for Discussion (based on project findings)

• Centralize and standardize economic impact data
  o Create mechanisms for real-time provisioning of economic-impact data
  o Engage first responders and strategic planners at different levels of government
  o Analyze continental scale patterns and trends

• Investigate methods for interlinking economic impacts of cascading hazards
  o Extend CEC methodology for application to wildfires, droughts, hurricanes, snowstorms, landslides

• Link flood-cost data to flood risk maps at different scales
  o Better design future efforts to build resilience

• Facilitate flow of data from/to the insurance sector, ensuring confidentiality
Re-Energize DR³

www.govdisasters.com

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Funders: