Stakeholder Engagement to Re-Energize Disaster Risk Reduction and Resilience (DR^3) for Advanced Data Processes

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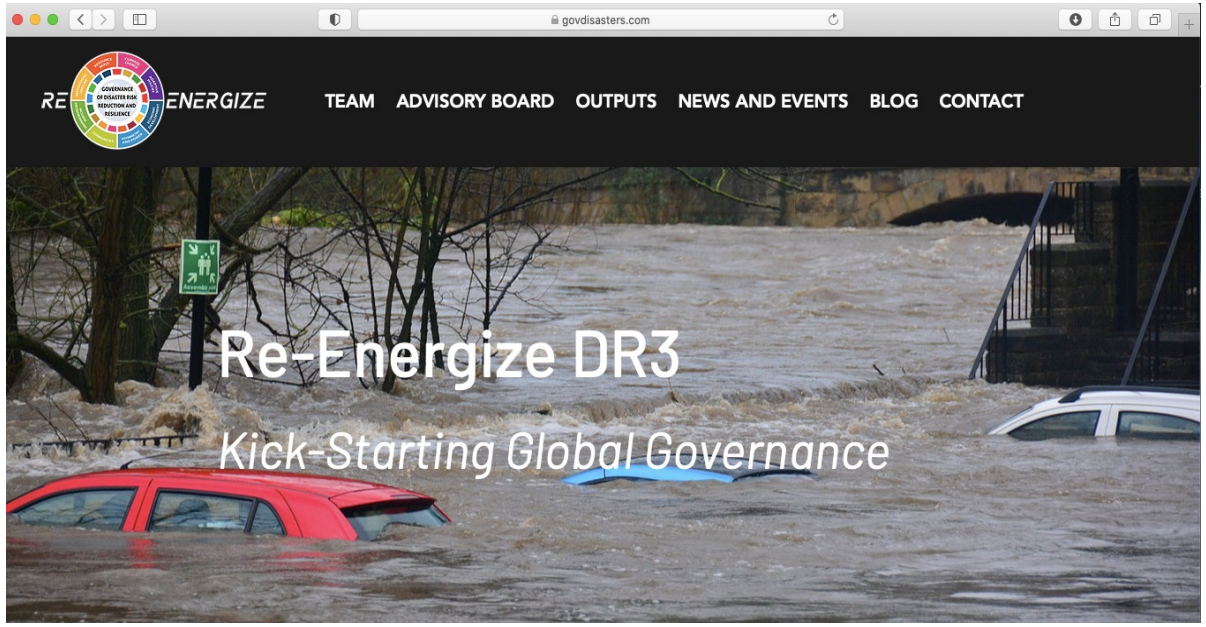
Project Profile: **Re-Energize DR3**

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



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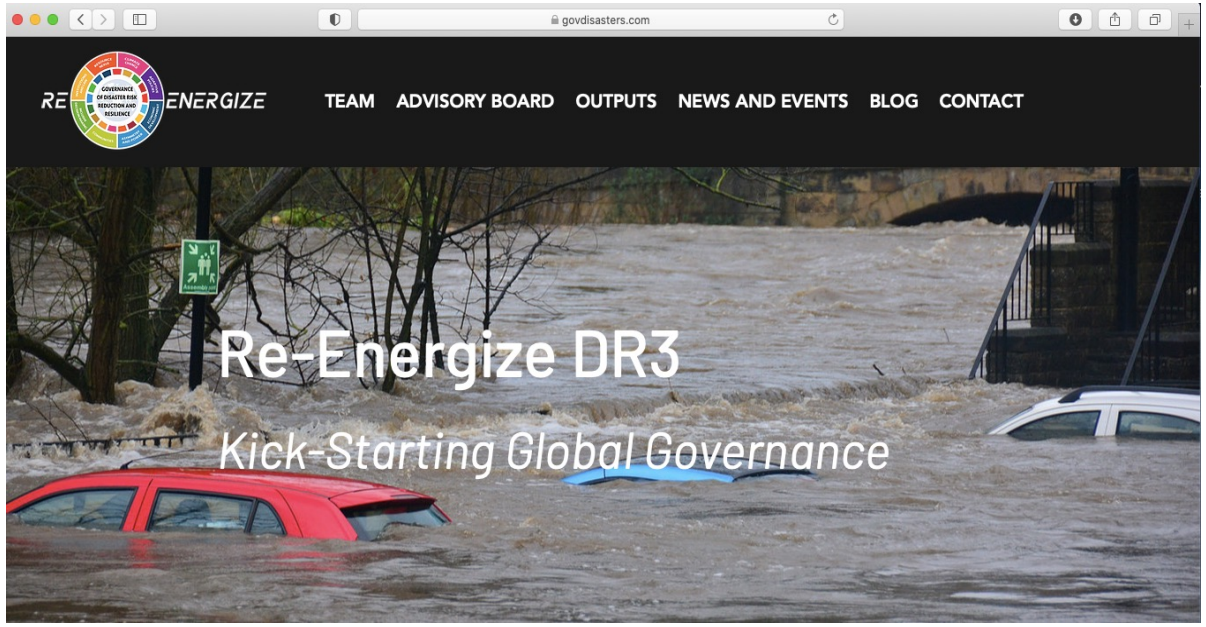
www.islandslaboratory.com

“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

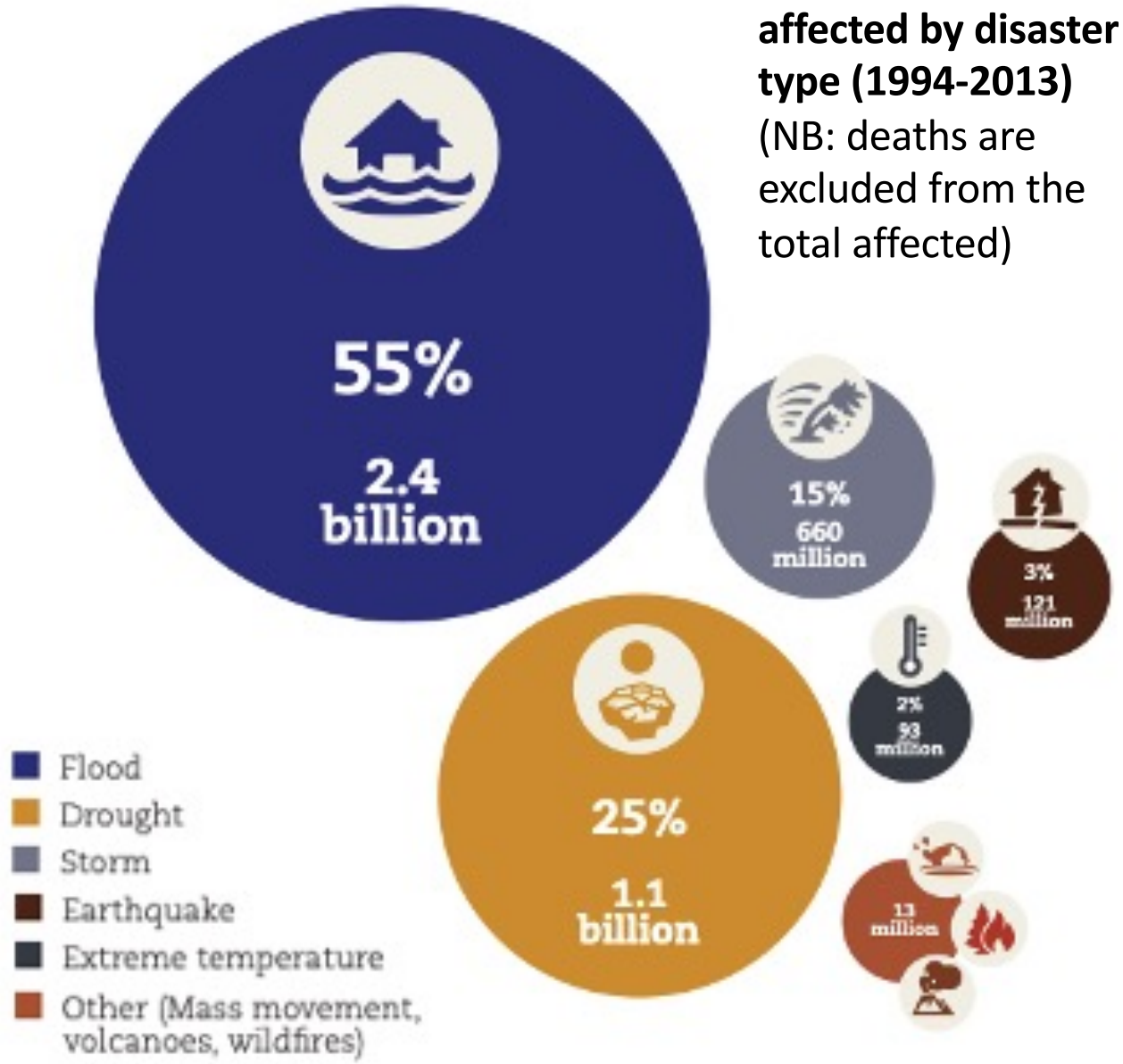
250.9 person-months

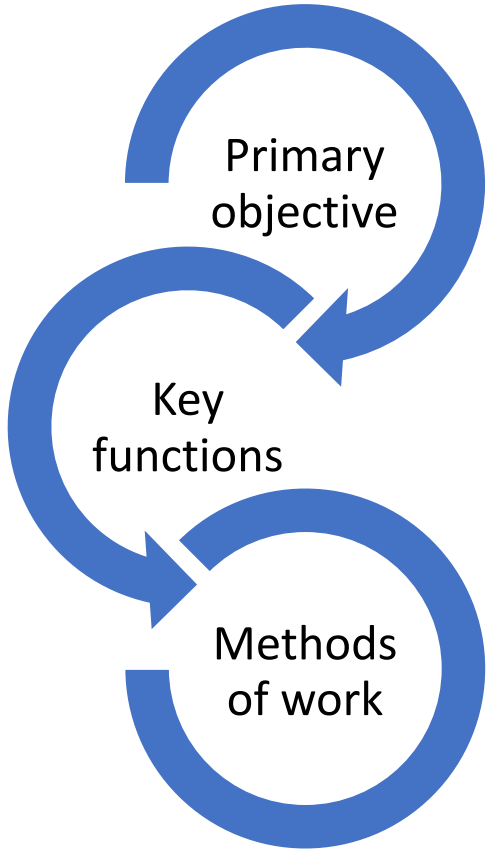
26 Supporting Institutions

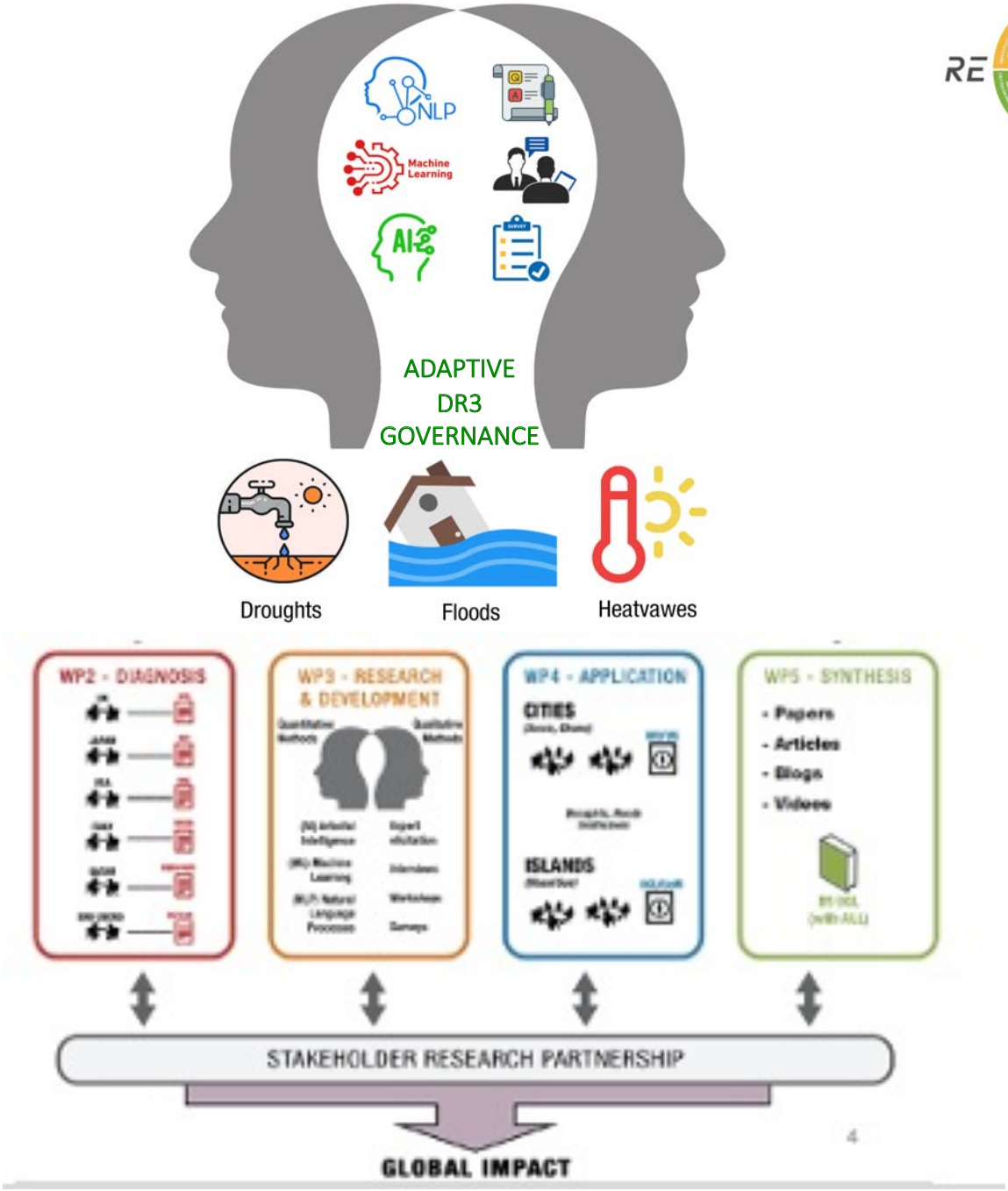
https://www.govdisasters.com

Which disasters?

Number of people affected by disaster type (1994-2013)
(NB: deaths are excluded from the total affected)

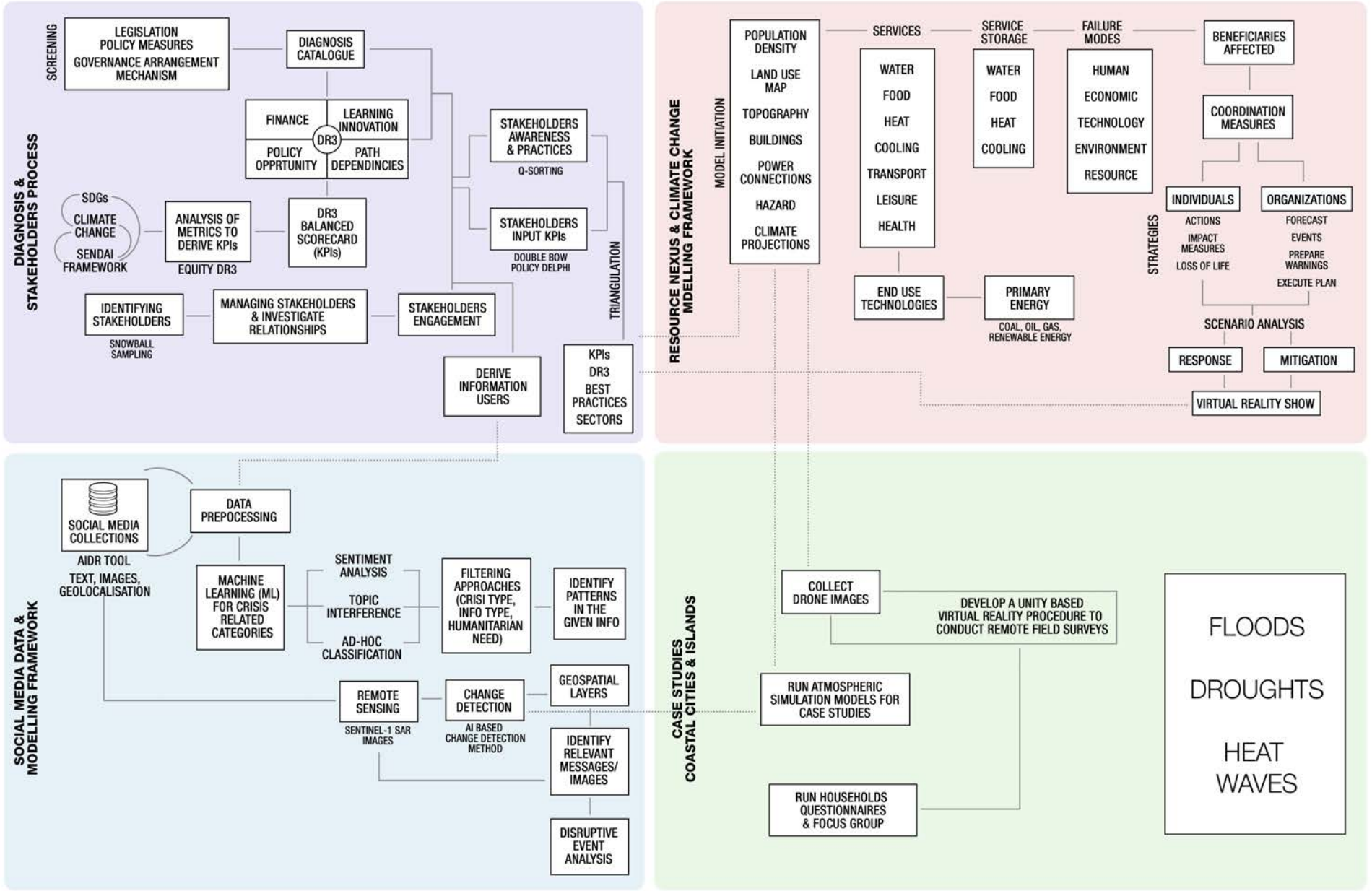




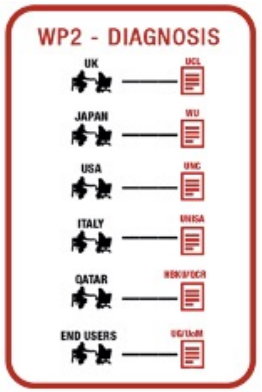


Re-Energize DR3 Research Programme

Re-Energize DR3 Governance Toolbox



Multilevel Governance for Equitable DR3



GENERAL CHARACTERISTICS
- Geographical
- Physical
- Socio-economic
- Governance
- Local

DRIVING FORCES
- Climate Change
- Sustainability
- Economics
- Technology
- Politics

GUIDING NORMS
- Disaster and Climate change Laws
- Principle of intra-generational equity

DR3 STRATEGIES
- ANTICIPATION
- ASSESSSMENT
- PREVENTION
- PREPARATION
- RESPONSE

DR3 metrics and indicators

GOVERNANCE ARRANGEMENT

DECENTRALISED	CENTRALISED

Stabilising Factors
- Reproduction Mechanisms
- Path dependencies

Change factors
- Policy Opportunity

DIAGNOSIS CATALOGUE (**ALL**)

SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015-2030

SUSTAINABLE DEVELOPMENT GOALS

PARIS2015 COP21·CMP11

GLOBAL INITIATIVES

KPIs INDICATORS

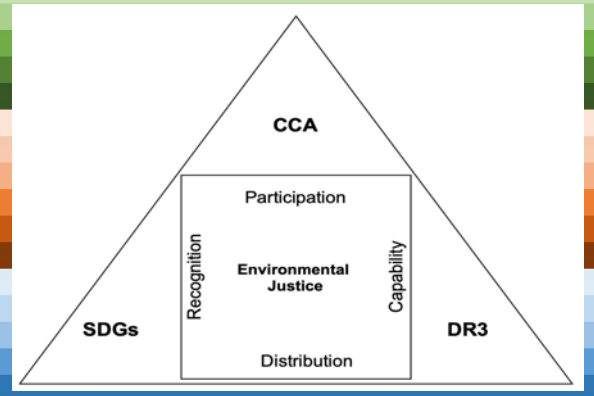
DR3 BALANCED SCORECARD (KPIs) (**UNC**, **UCL**)

DR3 Balanced Scorecard: UK vs. US

FINANCE	PROCESS		BENEFICIARIES		LEARNING AND INNOVATION
ANTICIPATION	ANTICIPATION		ANTICIPATION		ANTICIPATION
ASSESSMENT	ASSESSMENT		ASSESSMENT		ASSESSMENT
PREVENTION	PREVENTION		PREVENTION		PREVENTION
PREPARATION	PREPARATION		PREPARATION		PREPARATION
RESPONSE	RESPONSE		RESPONSE		RESPONSE
RECOVERY	RESPONSE		RECOVERY		RECOVERY

	PERIOD					
	ANTICIPATION	ASSESSMENT	PREVENTION	PREPARATION	RESPONSE	RECOVERY
FINANCE						
PROCESS						
LEARNING AND INNOVATION						
BENEFICIARIES						

	FIVE NODE NEXUS					
	WATER	ENERGY	FOOD	MATERIALS	LAND	FIVE-NODENEXUS
FINANCE						
PROCESS						
BENEFICIARIES						
LEARNING AND INNOVATION						



FINANCE	PROCESS	LEARNING & INNOVATION	BENEFICIARIES
RESPONSE	RESPONSE	RESPONSE	RESPONSE
RECOVERY	RECOVERY	RECOVERY	RECOVERY
MITIGATION	MITIGATION	MITIGATION	MITIGATION
PREPAREDNESS	PREPAREDNESS	PREPAREDNESS	PREPAREDNESS

		PERIOD			
		Response	Recovery	Mitigation	Preparedness
BALANCED SCORECARD	Finance				
	Process				
	Learning & Innovation				
	Beneficiaries				

Example for Stakeholders:

Response		
Federal	State	Local
FEMA	NC Emerg	City counc

Example for KPIs

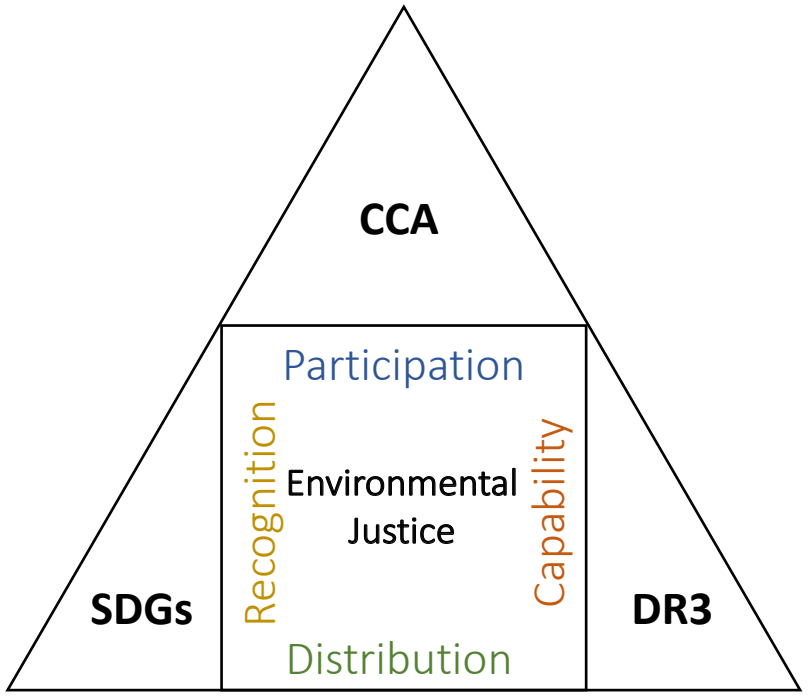
MITIGATION			
Type	Indicator	Description	Reference
SDG 13	13.3 Improve educati	13.3.1 Number of cou	UNDP
SDG 13	13.3 Improve educati	13.3.2 Number of cou	UNDP
SDG 11	articipatory, integrate	vil society in urban pla	UNDP

DR3 Scorecard Indicator Comparison:

UK vs. US Approaches

BALANCED SCORECARD		
Total Indicators	455	122
Finance	96	20
Process	139	39
Learning and innovation	11	12
Beneficiaries	209	51
Anticipation	70	-
Assessment	151	-
Prevention	90	-
Preparation	68	-
Response	56	28
Recovery	20	44
Mitigation	-	23
Preparedness	-	37
Nexus Related Indicators	119	-
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]	3[3]
National Grey literature	17[4]	0
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]	0

DR3 Governance DR3 & Balanced Scorecard



FINANCE	PROCESS		BENEFICIARIES	LEARNING AND INNOVATION
ANTICIPATION	ANTICIPATION		ANTICIPATION	ANTICIPATION
ASSESSMENT	ASSESSMENT		ASSESSMENT	ASSESSMENT
PREVENTION	PREVENTION		PREVENTION	PREVENTION
PREPARATION	PREPARATION		PREPARATION	PREPARATION
RESPONSE	RESPONSE		RESPONSE	RESPONSE
RECOVERY	RESPONSE		RECOVERY	RECOVERY

	PERIOD					
	ANTICIPATION	ASSESSMENT	PREVENTION	PREPARATION	RESPONSE	RECOVERY
FINANCE						
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LEARNING AND INNOVATION						
BENEFICIARIES						

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FINANCE						
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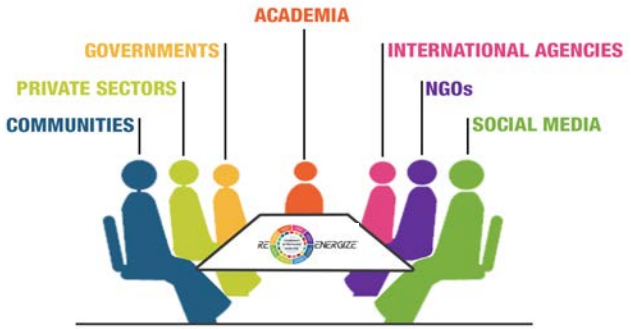
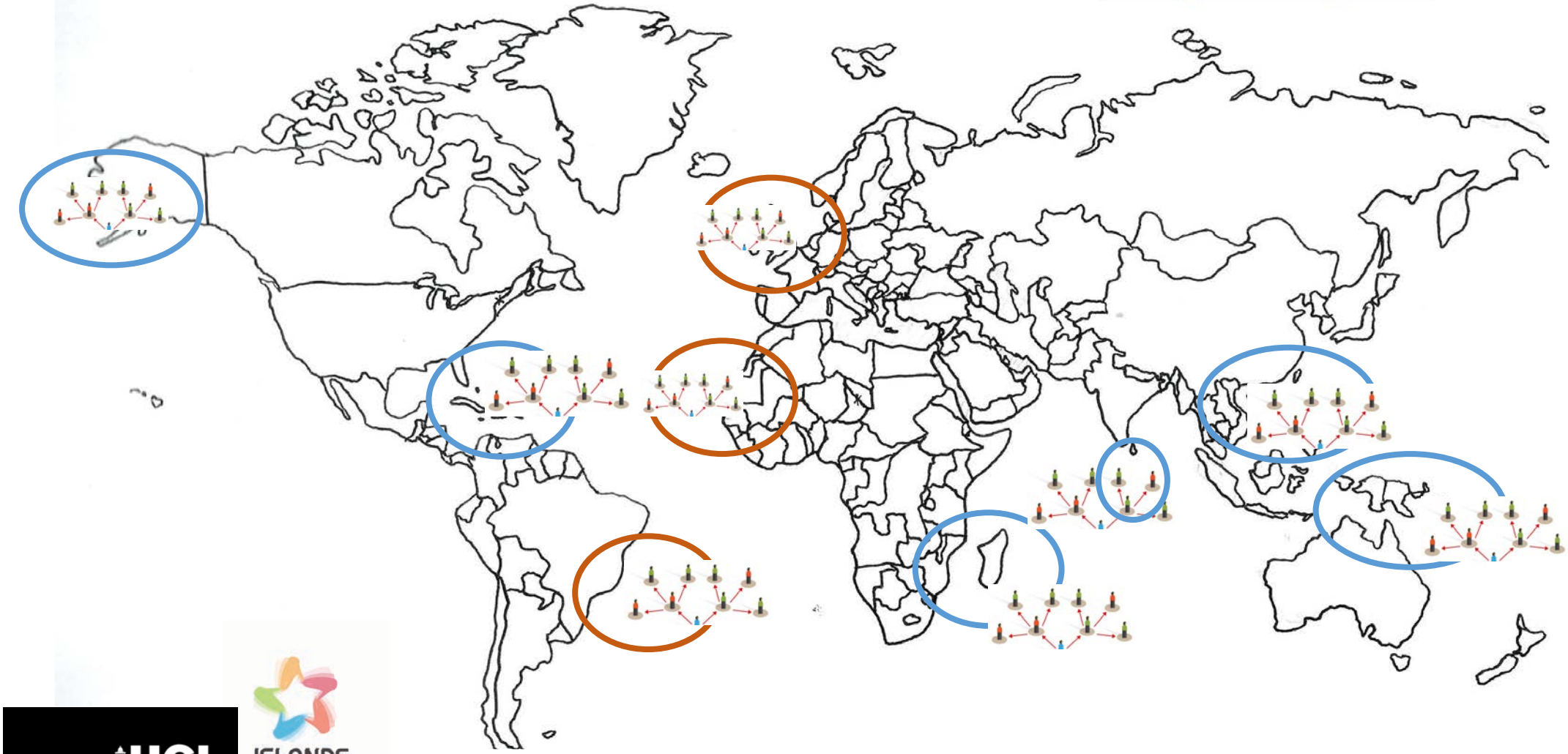
BENEFICIARIES						
LEARNING AND INNOVATION						

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

Stakeholder Engagement



RE ENERGIZE



3 Coastal Cities

6 Island Clusters

UCL ISLANDS LABORATORY

DR^3 in the US & UK

Kristen Downs, MS

PhD Candidate, Environmental Sciences & Engineering

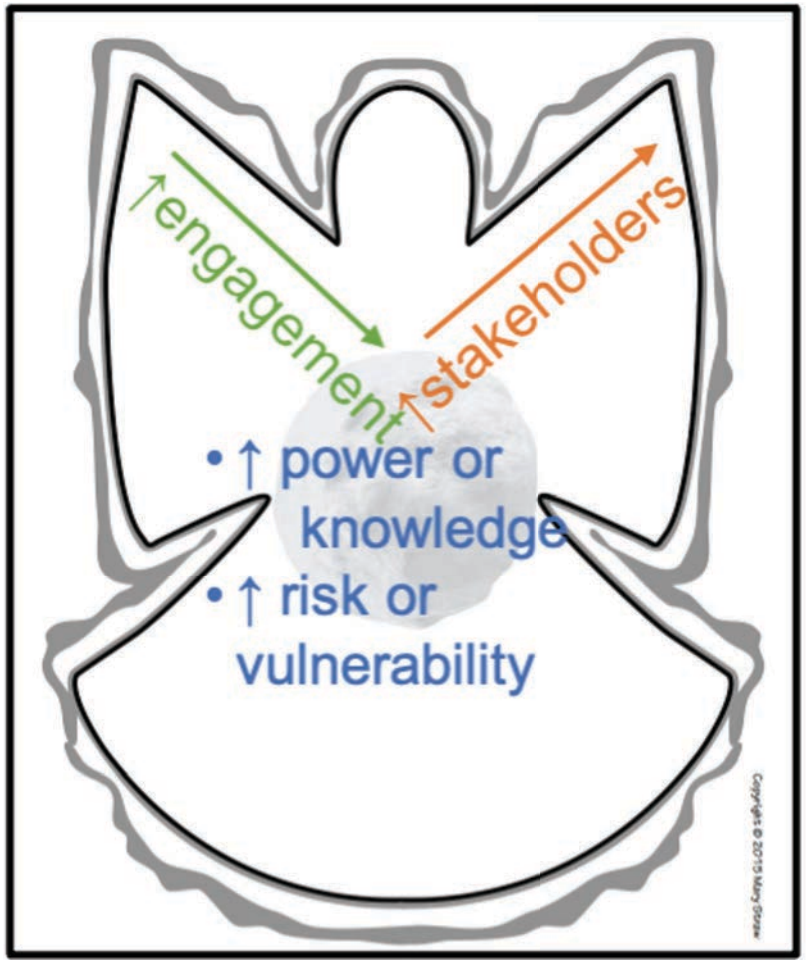
University of North Carolina at Chapel Hill

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



Snow Angel Concept

Figure Credit: Kristen Downs

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

~100 invitees **16** participants

2	Government		Persons with Disability
2	Academic		Indigenous
6	NGO/Volunteer	**1**	Women's Group
2	Business/Industry		Children/Youth
3	Advocacy		Church
	Think Tank		Fisheries
	Trade Unions		

Stakeholder Engagement

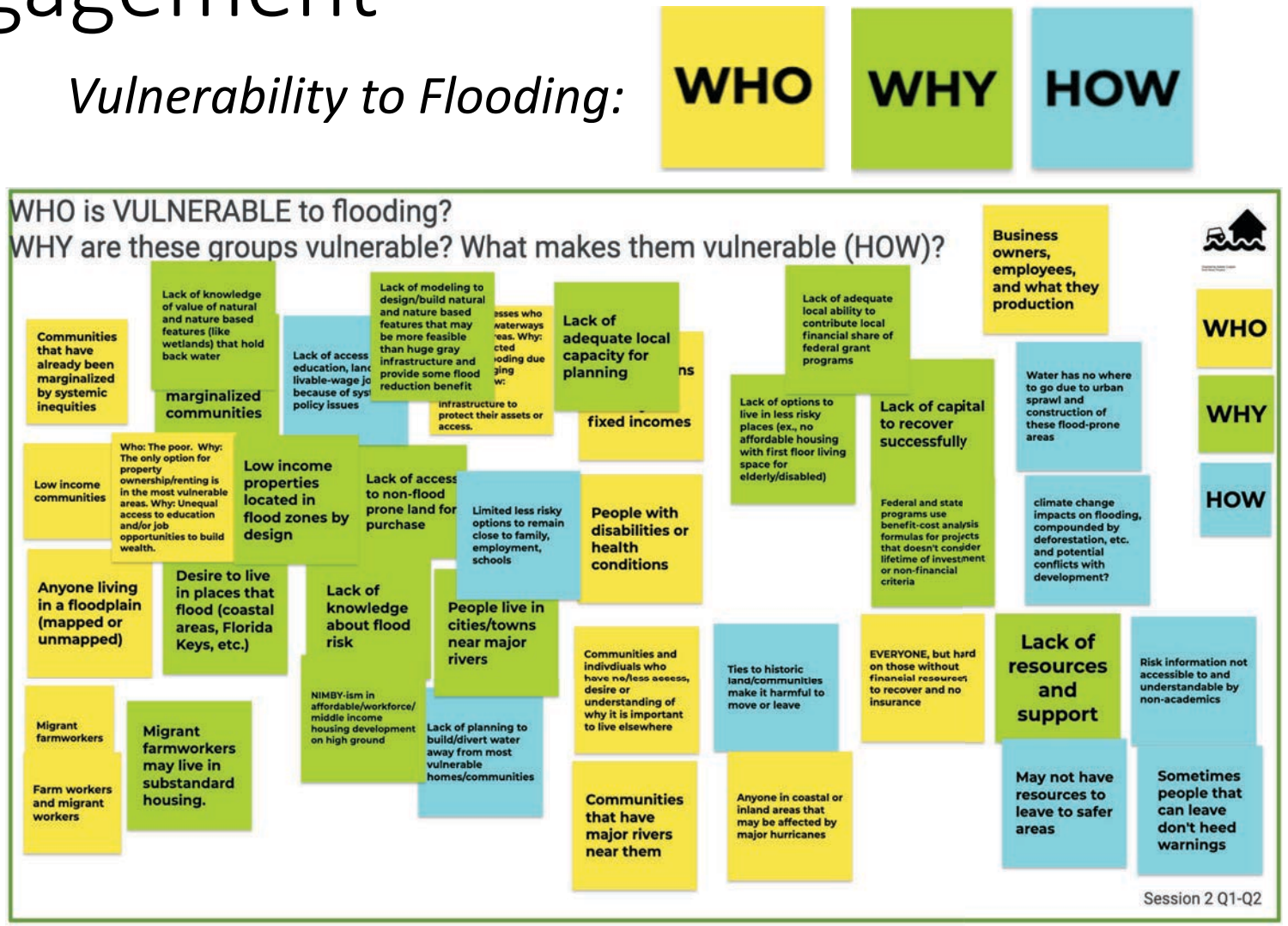
What worked well?

- Smaller groups
- Various engagement styles
- Mix stakeholders w/in groups
- Google Jamboards

What didn't work?

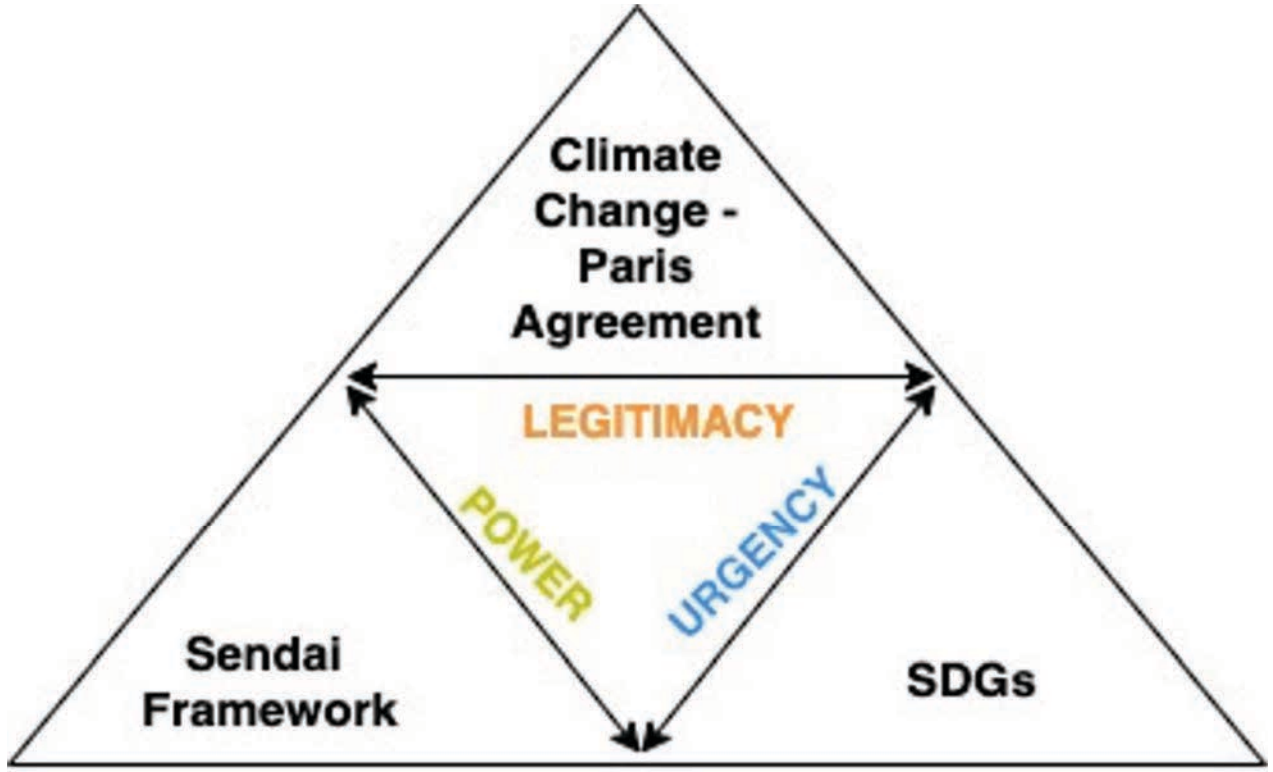
- Asked a lot of information upfront
- Limited involvement from National level and multiple stakeholder groups

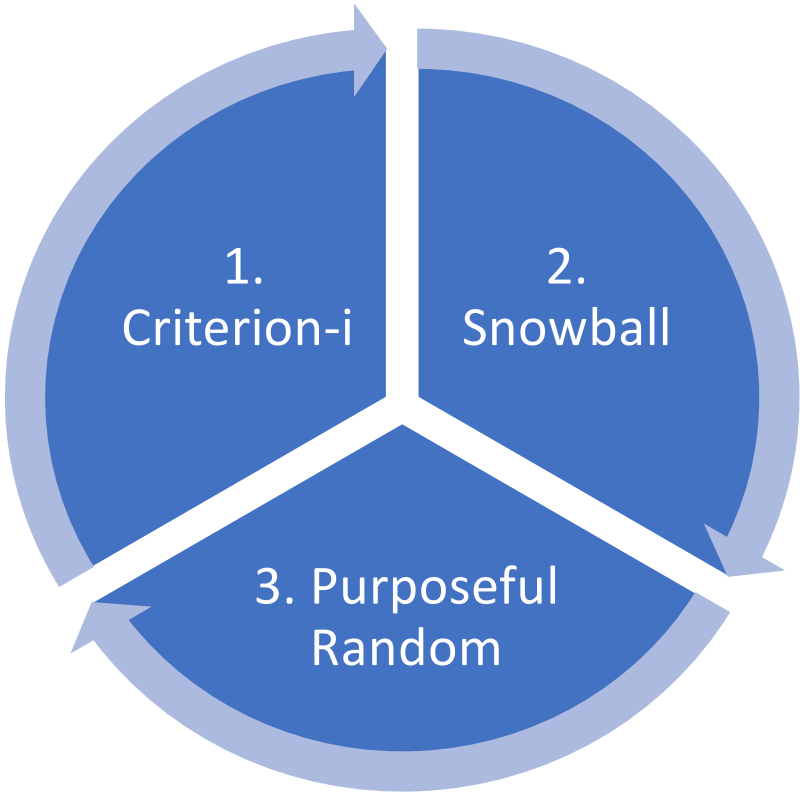
Vulnerability to Flooding:



*Participant responses written on **Google Jamboard** sticky notes*

Stakeholder Identification & Selection





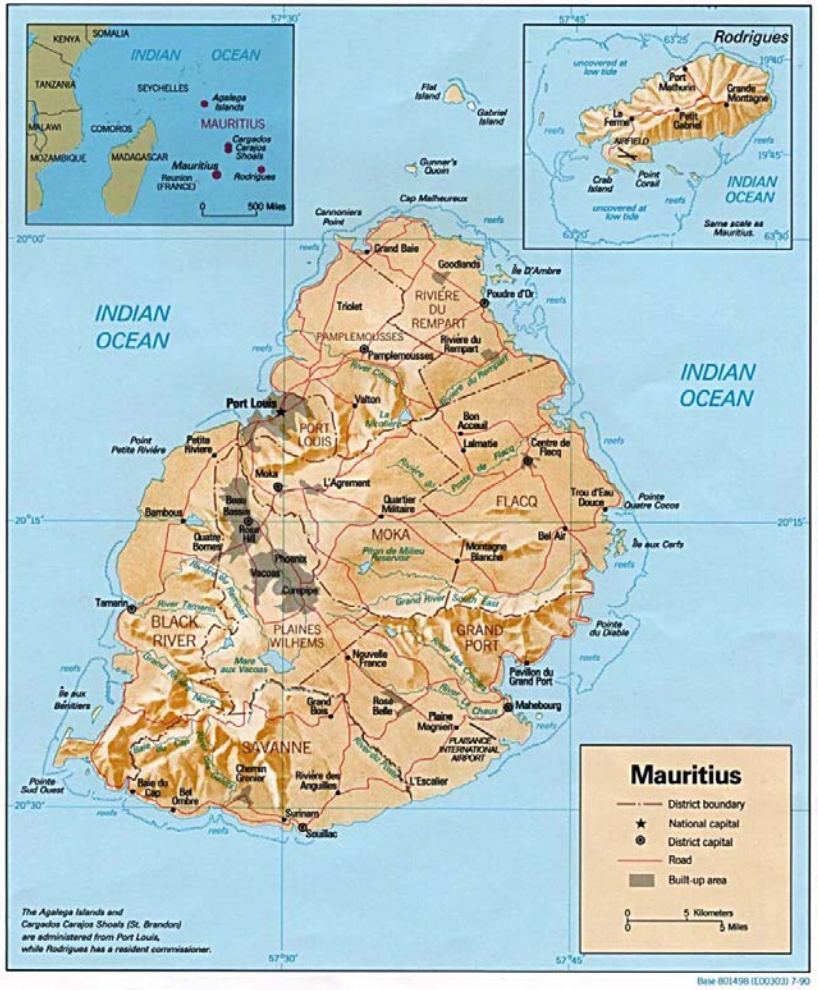
DR^3 in Mauritius

Manta Devi Nowbuth, MSc, PhD

Associate Professor

University of Mauritius

Stakeholder Engagement for DR^3 in Mauritius



World Risk Index Ranking

2018 – 16th

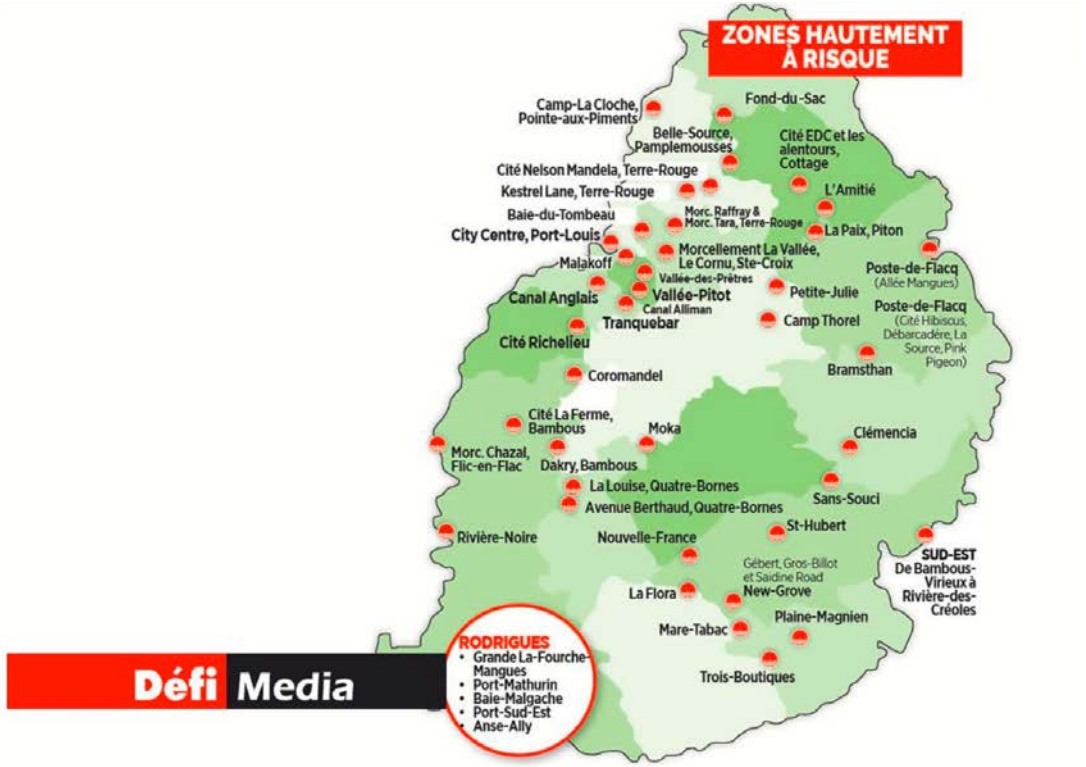
2019 – 47th

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

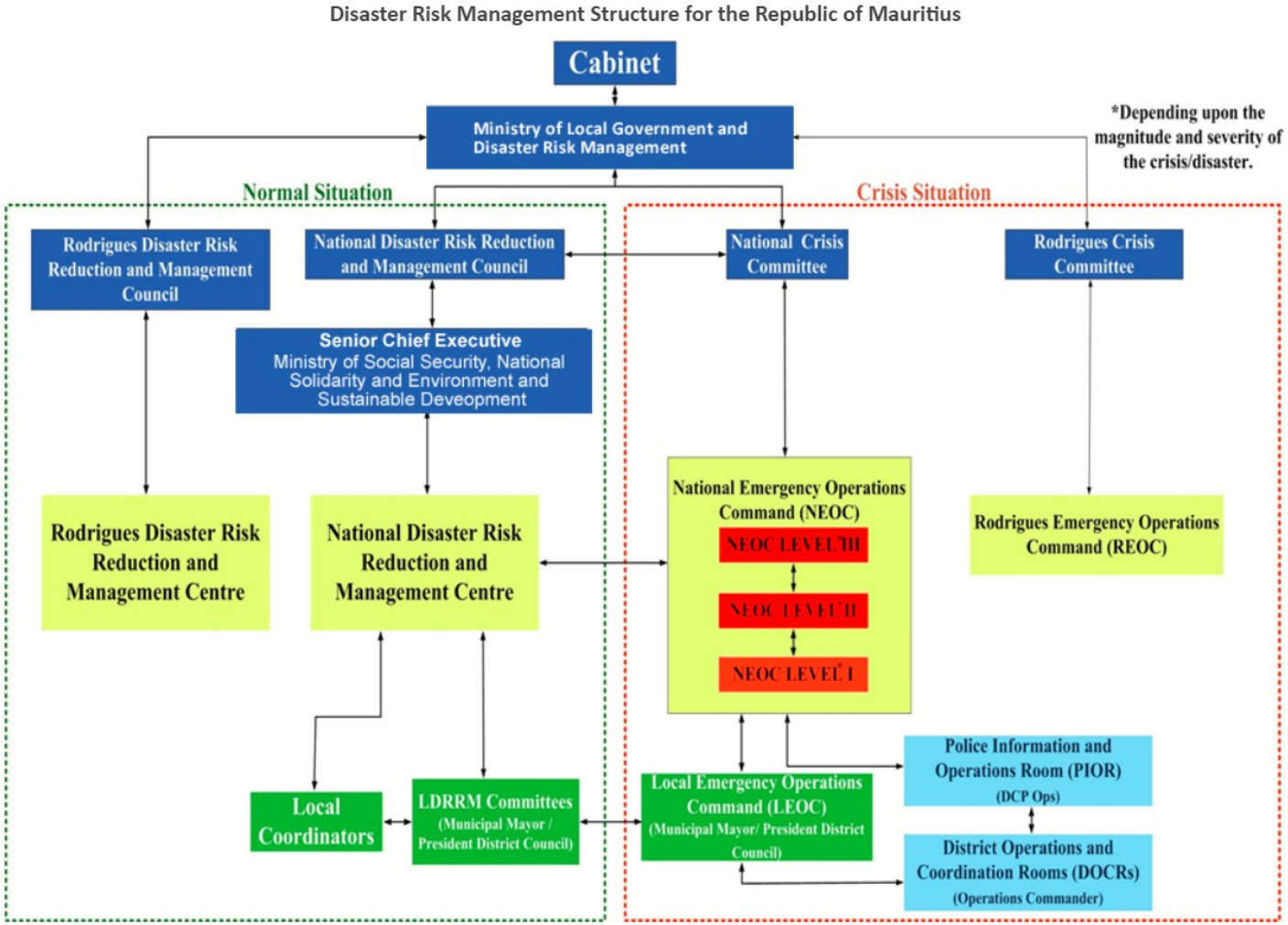


"According to the Land Drainage Authority: 297 flood zones and 48 high risk locations listed" in Mauritius (Defimedia June 27, 2021)

- **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

Stakeholder Engagement

National Disaster Risk Reduction & Management Center (NDRRMC)



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

DR^3 in Ghana

Yaw Agyeman Boafo, PhD

Research Fellow, Centre for Climate Change & Sustainability Studies

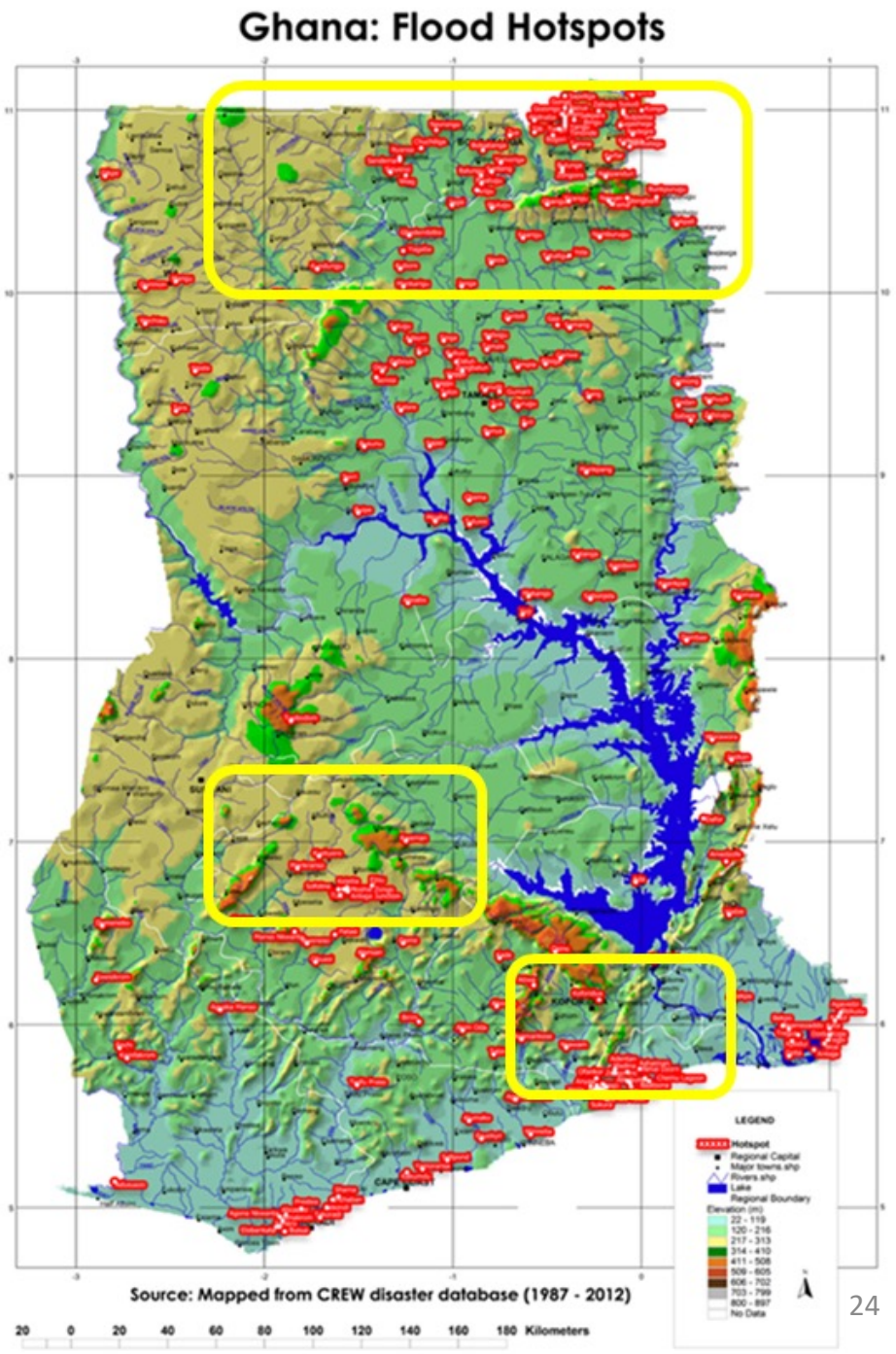
University of Ghana

https://www.ug.edu.gh/c3ss/faculty/dr-yaw-agyeman-boafo

Disaster Risk in Ghana

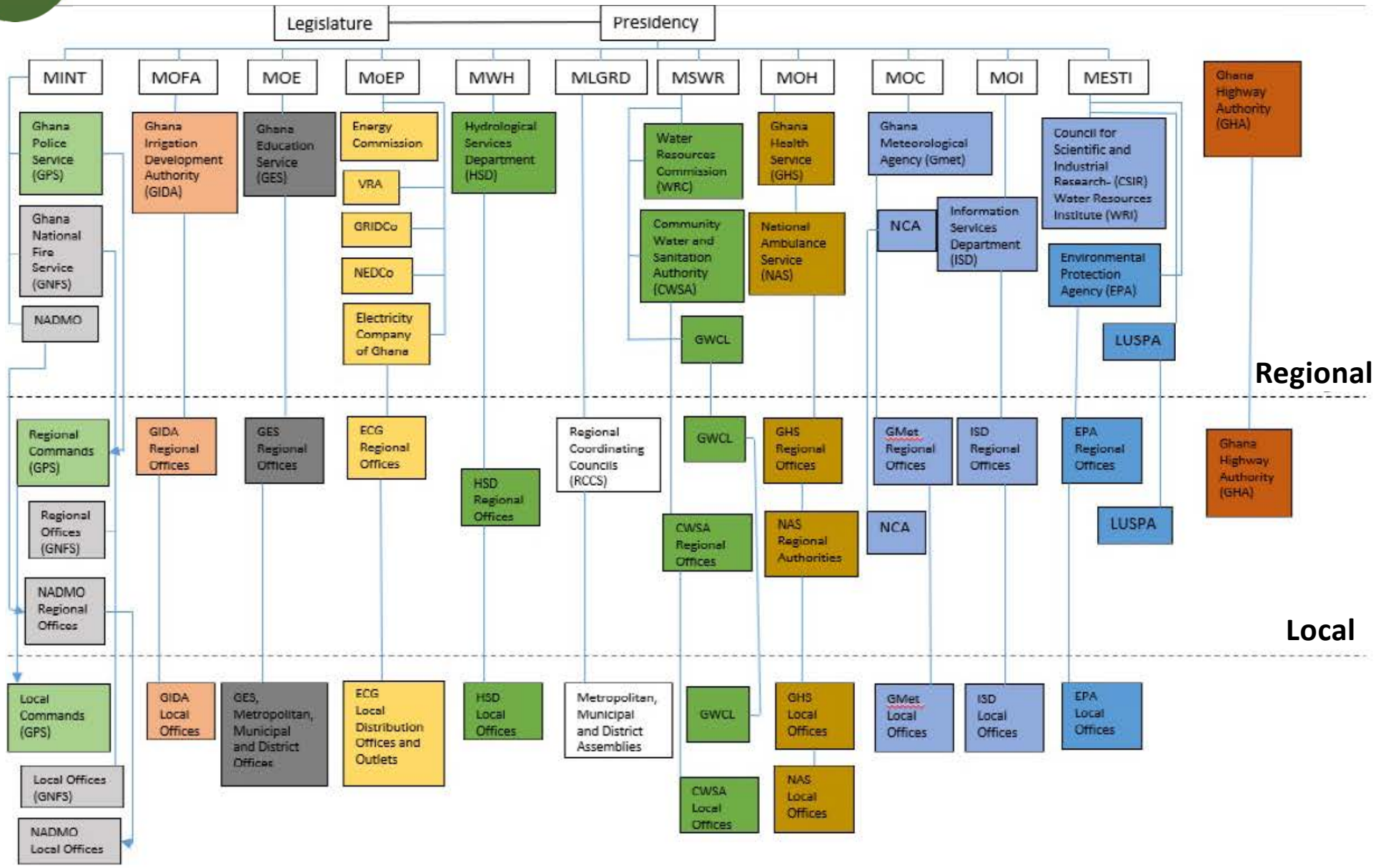
#	Disaster Type	Examples
1	Insect & Pest Infestation	Blackfly, armyworm, anthrax, locust, etc.
2	Diseases & Epidemics	Yellow fever, pandemic influenza, cerebro-spinal meningitis (CSM), cholera
3	Geological/Nuclear Radiological	Landslide, gas emission, earthquakes, tsunamis
4	Human-induced/ Man-made	Marine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

Source: Community Resilience through Early Warning (CREW) project



Accra after heavy rains, June 2016

State-level DR³ Actors in Ghana



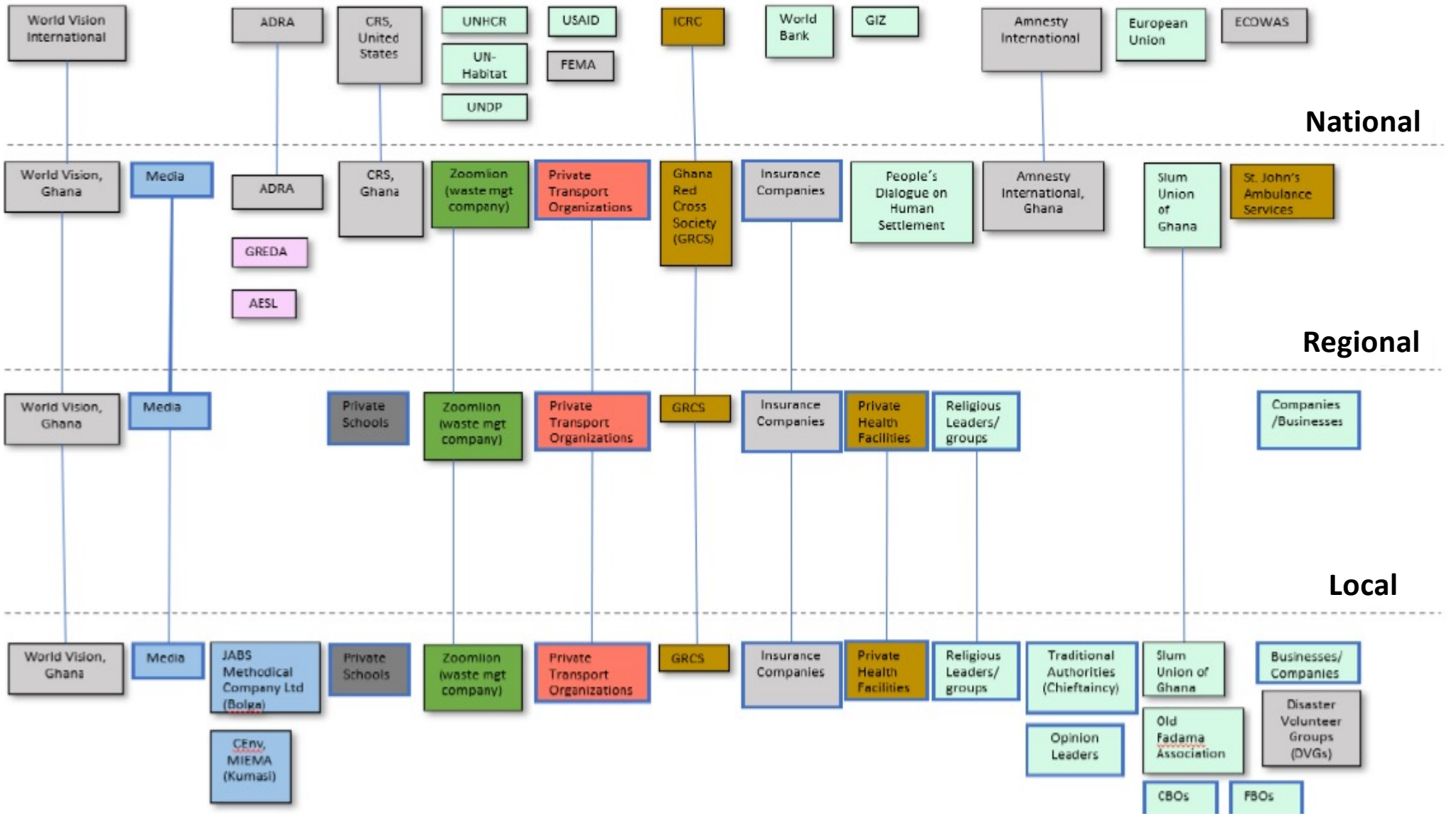
Legend (Policy Sectors)

- Security
- Agriculture
- Communication & Information
- Education
- Energy
- Water & Sanitation
- Health
- Disaster Mgt, Relief & Support
- Environment and Spatial Planning
- Transportation (infrastructure)
- Ministries & Coordinating bodies

Abbreviations

ECG: Electricity Company of Ghana
GRIDCo: Ghana Grid Company Limited
GWCL: Ghana Water Company Limited
LUSPA: Land Use and Spatial Planning Authority
MESTI: Ministry of Environment, Science, Technology and Innovation
MINT: Ministry of Interior
MLGRD: Ministry of Local Government and Rural Development
MOC: Ministry of Communication
MOE: Ministry of Education
MoEP: Ministry of Energy and Petroleum
MOFA: Ministry of Food and Agriculture
MOH: Ministry of Health
MOI: Ministry of Information
MSWR: Ministry of Sanitation and Water Resources
MWH: Ministry of Works and Housing
NADMO: National Disaster Management Organization
NEDCo: Northern Electricity Distribution Company
NCA: National Communication Authority
VRA: Volta River Authority

Non-state-level DR³ Actors in Ghana



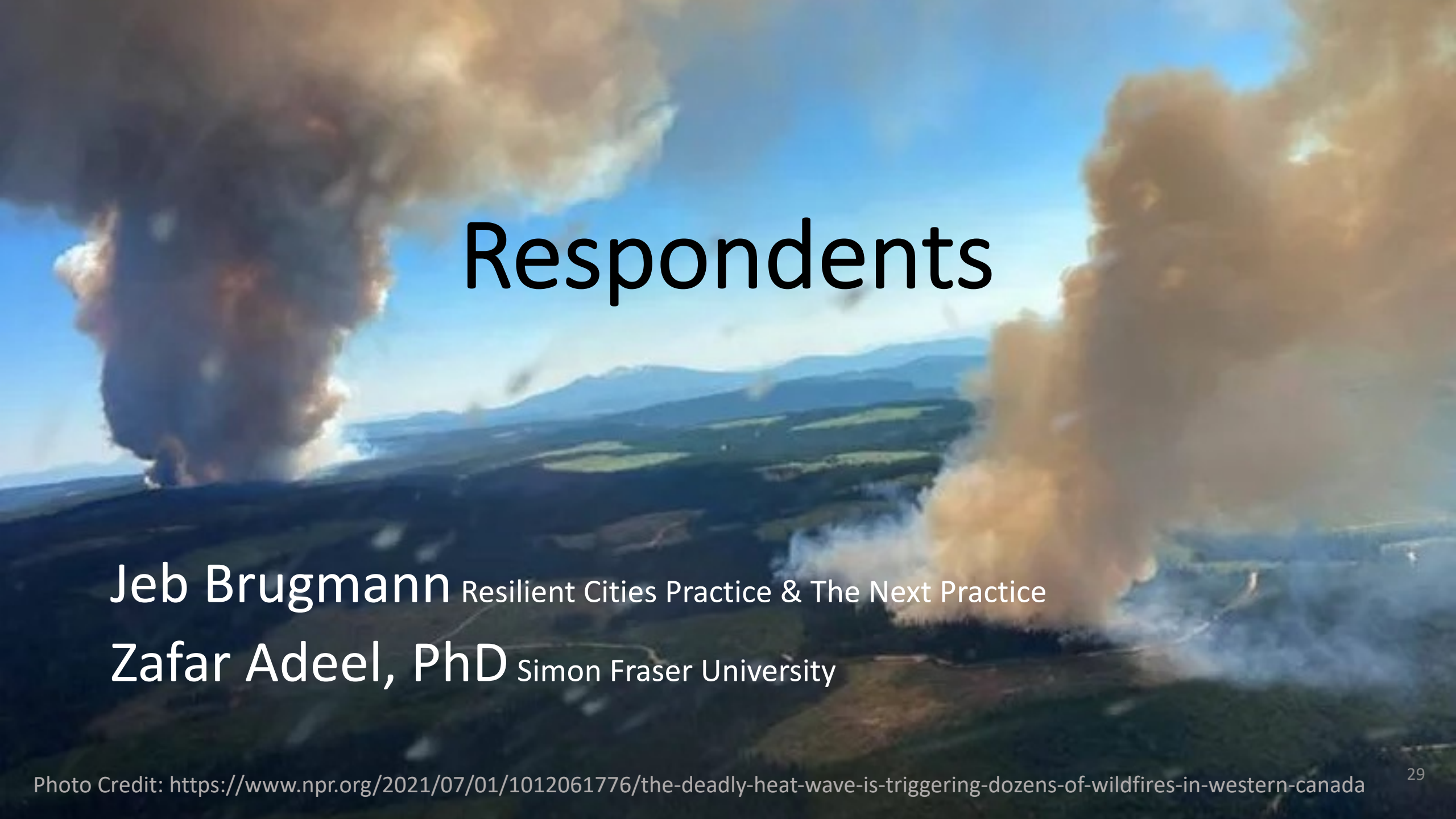
Abbreviations:

ADRA: Adventist Development and Relief Agency
AESL: Architectural and Engineers Services Limited
CBO: Community Based Organizations
CRS: Catholic Relief Services
ECOWAS: Economic Community of West African States
FBO: Fate Based Organizations
FEMA: Federal Emergency Management Authority
GIZ: The Deutsche Gesellschaft für Internationale Zusammenarbeit
GREDA: Ghana Real Estate Developers Association
ICRC: International Committee of the Red Cross
JICA: Japan International Cooperation Agency
UN-Habitat: United Nations Habitat for Human Settlements
UNHCR: United Nations High Commission for Refugees
USAID: United States United States Agency for International Development
Media: Include electronic, radio & Television

Reflections on Stakeholder Engagement in Ghana

- Which types of **actors** are involved in the disaster risk reduction and resilience (DR^3) network in Ghana?

- How are **DR^3 networks structured** in relation to information, knowledge, resource exchange, and trust for sustainable development?

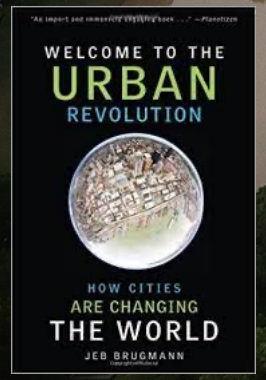


Respondents

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

SFU PACIFIC WATER RESEARCH CENTRE

Approaches for Enhanced Resilience

Action Framing

Conceptual Framing

- 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
  - Create mechanisms for real-time provisioning of economic-impact data
  - Engage first responders and strategic planners at different levels of government
  - Analyze continental scale patterns and trends
- Investigate methods for interlinking economic impacts of cascading hazards
  - Extend CEC methodology for application to wildfires, droughts, hurricanes, snowstorms, landslides
- Link flood-cost data to flood risk maps at different scales
  - 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:

EPSRC Pioneering research and skills

NSF

الصندوق القطري لرعاية البحث العلمي Qatar National Research Fund

JST Japan Science and Technology Agency

Q&A

Photo Credit: Jeremy Bishop on Unsplash