Community engagement in preparing for natural water disasters of different time and magnitude scales

A comparative study between Japan and England

Hideyuki Shiroshita [1], Ravindra Jayaratne [2], Kaori Kitagawa [3]

[1] Kansai University Faculty of Societal Safety Sciences

[2] University of East London School of Architecture Computing and Engineering

UCL Institute of Education

Email: hideyuki@kansai-u.ac.jp

Abstract

This exploratory research funded by the Daiwa Anglo-Japanese Foundation considers two challenges recognised in the DRR community in recent years. One is the necessity of 'all of society engagement' emphasised in the Sendai Framework for DRR 2015-2030, which has led to the reinforcement of community-based DRR. The other is, as the Red Cross World Disasters Report 2014 criticises, experts 'persist' in prioritising high-impact/low-frequency hazards. Inquiries into communities' DRR against hazards of different return periods and magnitudes have been scarce. The research focuses on natural water disasters, such as floods and typhoons generated due to atmospheric forcing factors, which have been intensified by climate change, as well as tsunamis. Both Japan and England have had a series of impacts of them in recent years. Applying a comparative approach, the research discusses four cases of under-researched water disaster-prone communities in Oita and Wakayama Prefectures, and the Essex and Devon Counties. The two research questions probed are: 1) to what extent the perceptions between DRR experts and community members differ in relation to disasters with different return periods and magnitudes; 2) what are the implications of the perception gap on the actualisation of 'community-based' and 'participatory' DRR. The interdisciplinary research team combines the observation of major structural mitigation solutions (e.g. barrier walls, embankments and evacuation shelters etc.) against water disasters of different scales in the four cases, and the analysis of non-structural measures through stakeholder interviews – policy-makers, academics, activists, community members – undertaken in the four communities. One of the key findings of the research is that both DRR experts and community members approach high-impact/low-frequency hazards with 'prevention' and 'reduction' measures, while for low-impact/high-frequency hazards, the countermeasures become 'adaptation'. This has led us to consider developing a new framework in categorising water disasters, applying a new index – the number of people 'affected' – in addition to scale and magnitudes. The novelty of the framework is to include community

perspective so as to enable a community-based bottom-up approach in decision-making of DRR measures.

Keywords

Community engagement, Categorising disasters, Japan, England

MEETING FORMAT*

*Select an option (X).

	Regular Poster Presentation
	Young Scientist Poster Presentation
X	Regular Oral Presentation
	Young Scientist Oral Presentation
	Symposia
	Roundtable

AREAS*

Natural hazards	X	Seismic
	X	Flooding
		Subsidence
	X	Hurricanes
	X	Landslides
		Volcanic eruption
		Wildfire

Technological and manmade hazards		Chemical and petrochemical industry
		Nuclear industry
		New and emergent technologies
		Transportation
		Natech
		Critical infrastructures
		Cyber attacks
		Terrorism

Complex hazard interactions and systemic risks		Climate change and its impact
		Natech
		Epidemics / pandemics
		Critical infrastructures

TOPICS*

*Select an option (X)

Learning from experience		Organizations, territories and experience feedback
		Expertise and knowledge management
		Weak signals
		Early warning systems

Social and human sciences for risk and disaster management		Human, organizational and societal factors
	X	Risk perception, communication and governance
		Systemic approaches
		Risk and safety culture
		Resilience, vulnerability and sustainability: concepts and applications
		History and learning from major accidents and disasters
		Territorial and geographical approaches to major accidents and disasters
		Social and behavioral aspects

Cross-disciplinary challenges for integrated disaster risk management		Compound/cascading disasters (simultaneous and/or co-located) and Mega-disasters
		Connecting observed data and disaster risk management decision-making
		Practical applications of Integrated Disaster Risk Management
		Development and disasters
		Build Back Better (than Before)
		Disaster-driven innovation and transformation
		STGs and disaster governance
Complex systems		Complexity Modeling
		System of Systems / Distributed Systems
		Critical Infrastructures
		Probabilistic Networks
Economics and Insurance		Disaster impacts and economic loss estimation
		Cost-benefit approaches
		Insurance and reinsurance
Decision, risk and uncertainty		Decision aiding and decision analysis.
		Disaster risk communication
		Ethics.
		Gender
		Responsibility
		Governance, citizen participation and deliberation
		Community engagement and communication
		Scientific evidence-based decision-making, modelling and analytics
		Policy analysis
		Uncertainty and ambiguity
		Multi-criteria decision aid and analysis
		Operational research
Artificial intelligence, big data and text data mining		Disaster informatics, big data, etc.
		Deep learning
		Neural networks
		Experts systems
		Text data mining

Engineering Models	
	Numerical modelling & functional numerical modeling
	Formal models / formal proofs
	Model-based approach
	Safe and resilient design and management.

Legislation, standardization and implementation	
	Certification and standardization.
	Regulation and legislation.
	Legal issues (scientific expertise, liability, etc.).
	Precautionary principle and risk control and mitigation.

SIGNIFICANCE TO THE FIELD*

*Select an option (X)

	Demonstrates current theory or practice
	Employs established methods to a new question
	Presents new data
X	Presents new analysis
	Presents a new model
	Groundbreaking
	Assesses developments in the field, in one or more countries
	Other (Please specify)

EXPECTED CONTRIBUTIONS*

*Select an option (X)

	Theoretical
	Applied
	Theoretical and Applied
	Review
X	Perspective
	Other (Please specify, e.g. success/failure practices, lessons learned, and other implementation evidence)