UKADR 20 23

2030 AND BEYOND:
Risk-informed decision making,
investment and behaviour

UNITED KINGDOM ALLIANCE FOR DISASTER RESEARCH

ANNUAL CONFERENCE 2023

BOOK OF ABSTRACTS

18-19th December 2023

UNIVERSITY OF HUDDERSFIELD
United Kingdom

UKADR
United Kingdom Alliance
for Disaster Research

University of
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GLOBAL DISASTER RESILIENCE CENTRE
School of Applied Sciences, University of Huddersfield

United Kingdom Alliance for Disaster Research - Annual Conference 2023

2030 AND BEYOND: Risk-informed decision making, investment and behaviour

BOOK OF ABSTRACTS

Edited by

Professor Dilanthi Amaratunga
Professor Richard Haigh
Malith Senevirathne
Georgina Clegg

December 2023

Professor Dilanthi Amaratunga, Professor Richard Haigh, Malith Senevirathne, and Georgina Clegg (*edited by*)

United Kingdom Alliance for Disaster Research (UKADR) Annual Conference 2023. *2030 AND BEYOND: Risk-informed decision making, investment, and behaviour.*

BOOK OF ABSTRACTS

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About the Conference

This book brings together the abstracts of papers and posters presented at the United Kingdom Alliance for Disaster Research (UKADR) Annual Conference 2023, University of Huddersfield, UK, 18th – 19th December 2023.

The conference is hosted by the Global Disaster Resilience Centre at the University of Huddersfield, in association with the CORE project (sCience & human factOr for Resilient society).

The conference theme, *2030 and Beyond: Risk-informed decision making, investment, and Behaviour*, highlights the pressing need to address global challenges and manage disaster risks effectively.

The conference is inspired by the Mid-term Review of the Implementation of the Sendai Framework 2015-2030 (MTR SF), which emphasises the importance of disaster risk management. While progress has been made since its implementation in 2015, our planet's increasing instability carries significant risks.

The conference theme encompasses a wide range of critical topics that shape the field of disaster research and risk-informed decision-making. Our aim is to foster interdisciplinary discussions and explore innovative approaches to address the challenges we face.

These themes serve as focal points for insightful discussions, knowledge sharing, and collaboration throughout the conference. Together, we aim to advance our understanding of disaster risks and drive effective decision-making for a more resilient future.

The themes include, but are not limited to:
- Risk Governance and Management
- Financial Aspects of Disaster Risk
- Interconnected Risks and Impacts
- Vulnerability and Inequality
- Nature-based Solutions and Environmental Resilience
- Resilient Infrastructure and Built Environment
- Data and Information Systems
- Community and Local Approaches
- Post-Disaster Recovery and Reconstruction
- Climate Change Adaptation

Along with technical sessions and poster presentations that address these themes, we are privileged to welcome keynotes by two distinguished speakers: Dr Abhilash Panda, Deputy Chief, Intergovernmental processes, Interagency cooperation, and Partnerships Branch United Nations Office for Disaster Risk Reduction (UNDRR); and Professor Suzanne Wilkinson, Associate Dean – Research, College of Sciences & Professor of Construction Management, Massey University, New Zealand.

The programme also includes a special session on *Learning in thought and practice – how far do coproduced research projects really enable critical learning? – Lessons from the Tomorrow's Cities project*. There is also a plenary session *Reflecting on COP28*, a panel discussion on the *Global Shelter Cluster Research Agenda*, a lunchtime session on *Inclusion in disaster risk reduction*, a pre-event *online workshop and networking over lunch for Early Career Researchers*, and the *UKADR Annual General Meeting*.

We very much hope you enjoy the conference.

United Kingdom Alliance for Disaster Research (UKADR)

The UKADR is an alliance of Disaster Researchers, broadly conceived, that are based in or have strong connections to the UK. The UKADR goal is to engage the UK Government and other national and international stakeholders in implementation of initiatives designed to minimise the global impact of disasters, particularly through the Sendai Framework for Disaster Risk Reduction. To achieve this, the function of UKADR is to represent the research community at government level in the UK and internationally and to bring researchers and practitioners together to share best practice and improve disaster risk research and its impact.

It has three main aims:
* Engaging UK Government
* Community Building
* Strengthening Science

These are achieved through regular meetings between members, including webinars and annual conferences, and through working closely with government, funders and the global disaster research community.

For more information, please visit the UKADR website at www.ukadr.org.

Acknowledgements

As Co-Chairs of the United Kingdom Alliance for Disaster Research (UKADR) Annual Conference 2023, *2030 and Beyond: Risk-informed decision making, investment, and Behaviour*, we are delighted to have the opportunity to hold this event at the University of Huddersfield.

The conference is organised by the Global Disaster Resilience Centre University of Huddersfield, UK, on behalf of UKADR, an alliance of Disaster Researchers, broadly conceived, that are based in or have strong connections to the UK.

The conference organising committee met regularly and together we made an array of, hopefully better, key decisions! All involved have provided a willing source of on-going support and guidance that is very much appreciated.

We thank the keynote speakers: Dr Abhilash Panda and Professor Suzanne Wilkinson, for their willingness to stimulate invaluable discussions and debate around the conference theme. We also thank session chairs for agreeing to ensure the conference is as challenging, exciting and rewarding as possible. The judging panel of the poster competition also need be thanked. Selecting the winners is not an easy decision with the number of high-quality submissions that were received.

We have received exceptional help and support from a number of people, organisations and bodies in the work for this conference. We would particularly like to acknowledge the support of Malith Senevirathne, from the Global Disaster Resilience Centre at the University of Huddersfield, for being the focal point in the organisational aspects of the Conference. Loretta Stoklosa and Jasmine Powell of the School of Applied Sciences, and Sybilla Daley, University Internal Events Manager, also deserve a special mention for supporting the logistical and other administrative activities around the Conference, and indeed Chameera Randil for doing all the wonderful designs.

Most of all, we want to thank all researchers of the Global Disaster Resilience Centre, who worked very hard for the professional undertaking of the work involved in the tasks that are so often unseen and unrewarded for a conference of this scale.

Finally, we would like to thank all the participants for their active participation at the conference and for their positive commitments towards disaster risk reduction activities. Most of all, we want to thank the speakers for their willingness to stimulate invaluable discussions and debate around the conference themes.

Prof. Dilanthi Amaratunga & Prof. Richard Haigh
Co-Chairs of the United Kingdom Alliance for Disaster Research (UKADR) Annual Conference 2023 – 2030 and Beyond: Risk-informed decision making, investment, and behaviour

December 2023

Conference Organisation

Organised by
Global Disaster Resilience Centre
University of Huddersfield, UK

On behalf of the
United Kingdom Alliance for Disaster Research (UKADR)

Chaired by
Professor Dilanthi Amaratunga
University of Huddersfield, UK

Professor Richard Haigh
University of Huddersfield, UK

Organising Committee

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Professor Richard Haigh
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Associated Projects

CORE

The CORE (sCience and human factOr for Resilient sociEty) project aims to develop a harmonized vision of crisis management awareness and capability. The project, funded by Horizon 2020 European Union funding for research and innovation, responded to the call 'human factors, and social, societal and organizational aspects for disaster-resilient societies'. The recommendations and guidelines that will be provided by CORE will foster the development of a culture of improved preparedness, adaptability, and resilience to risks that will accommodate a variety of human and social characteristics and vulnerabilities.

The project has 19 partners from 11 countries across Europe and beyond. It brings together hard science, social science, and societal acceptance, with the acknowledgment that this multidisciplinarity is essential in order to provide a harmonised resilience planning framework that handles risk, vulnerability, and resilience building.

The work of the project is built on the activities and results of previous and on-going projects and is driven by end-users within the consortium and their wider stakeholder networks. The following six themes are taken as the building blocks for the project's work: safety culture, social media support and threats to safety culture and community resilience, disaster scenarios and human behaviour, community identity as a resilience factor, cascading effects, and governance. In addition, the project has analysed specific risks of natural and anthropogenic origin, by drawing upon seven past disasters, including the L'Aquila earthquake, the 2011 Japan earthquake and tsunami, the wildfires in Israel, flash floods in France, the Manchester Arena terrorist attack, the styrene leak industrial accident in India, and the COVID-19 pandemic.

The overall objectives are:

1. To define and apply a crisis modelling framework able to describe disaster scenarios and dynamics according to human, social and societal variables and organizational aspects under cascading effects.

2. To define and test suitable indicators to assess the weight of Human Factors, social and societal aspects in societal resilience to disasters, providing an insight into resiliency diversity among European regions and social groups at local scale.

3. To define and apply a suitable methodology for more efficient use of social media in disaster situation based on the analysis of information flow prior, during and after the disaster as well as on analysis of how information in social media is influencing risks perceptions and how tools to fight misinformation could be used by various groups of stakeholders during the crisis management.

4. To deliver a set of guidance materials to implement and monitor initiatives with local communities to improve preparedness, adaptability, and resilience to risks by and for all social groups.

For more information about the CORE project, please visit euproject-core.eu.

University of Huddersfield and Resilient Societies

This conference received co-funding from the University of Huddersfield, which is seeking to build collaborative research, teaching and enterprise to improve the sustainability and resilience of nations and communities. It directly supports the University's Environmental and Sustainability Policy and contributes to the University's Climate Emergency Steering Group, thus paving the way for the University to fulfil its commitments to the United Nations Sustainable Development Goals.

The University is developing a strategic framework to coordinate the University's expertise and resources from all Schools to provide innovative solutions toward a disaster and climate resilient society. This includes bringing together expertise from across the University, including the: Global Disaster Resilience Centre; Research Centre on Climate Resilient Societies; Centre for Human and Physical Geography; Sustainability, Responsibility, Governance and Ethics (SRGE); Centre for Urban Design, Architecture and Sustainability (CUDAS); Energy Emissions and the Environment; Centre for Engineering Materials, Planning, Autonomy and Representation of Knowledge; Citizenship, Conflict, Identity, and Diversity; Applied Criminology and Policing Research Centre; and Efficiency and Performance Engineering.

Promoting multi-and inter-disciplinary research

Climate change and natural hazards often trigger chain reactions that lead to a long sequence of technical and societal damages with disastrous outcomes. Many natural hazards are also influenced or caused by human interventions. The interplay between natural and non-natural risks has become a prominent example of complex risk and disaster interactions. The COVID-19 pandemic also brought to the fore the concept of systemic risk - risks of high complexity and that are interconnected. These cascading impacts, of the type we have experienced from the pandemic, are poorly understood and somewhat unpredictable in terms of cause and effect. They are also transboundary and global in nature, challenging our decision makers as they don't fit easily into existing administrative or sectoral structures. This complexity has challenged our existing disaster and emergency management arrangements and undermined our efforts to achieve the Sustainable Development Goals.

Climate-driven environmental changes in Arctic Sea ice, permafrost, glaciology, freshwater, forests, wetlands, agriculture, coastal erosion/sea level rise have a profound impact on our economy, society, biodiversity and culture, so demanding a holistic approach bringing together all (human and physical) scientific and engineering disciplines to address the highly inter-connected climate-driven issues.

Conference Partner

International Journal of Disaster Resilience in the Built Environment

The International Journal of Disaster Resilience in the Built Environment (IJDRBE) aims at developing knowledge and capacity in strategic and practical aspects of disaster risk reduction, response and reconstruction to reduce the impact of natural and anthropogenic hazards. The journal publishes original and refereed material that contributes to the advancement of the research and practice and provides contributing authors with an opportunity to disseminate their research and experience to a broad audience. IJDRBE is the only journal to promote research and scholarly activity that examines the role of sustainable construction and urban development to anticipate and respond to hazard events that damage or destroy the built environment.

To contact us, find out more on the scope of the journal and more, please visit:

https://www.emeraldgrouppublishing.com/journal/ijdrbe

Global Disaster Resilience Centre (GDRC) - University of Huddersfield, UK

University of
HUDDERSFIELD
Inspiring global professionals

A leader in inter-disciplinary research, education and advocacy to improve the resilience of nations and communities. What would it be like to live in a world in which government authorities, businesses, communities and individuals work together to create a society that is able to withstand the effects of unforeseen events and threats? At the Global Centre for Disaster Resilience we are working with stakeholders at the global, national and local level to make this happen.

The Global Centre for Disaster Resilience is committed to excellence in research, education and advocacy to improve the resilience of nations and communities to disasters.

With growing population and infrastructures, the world's exposure to hazards is increasing. When disaster strikes, communities may need to be rebuilt physically economically and socially. At the same time, it is vital that any reconstruction activity pro-actively considers how to protect people and their environment, and reduce a community's vulnerability.

At the Global Centre for Disaster Resilience, our vision is for a society that has the capacity to resist or change in order to reduce hazard vulnerability, and to continue functioning physically, economically and socially when subjected to a hazard event.

We seek to achieve our vision by undertaking work that crosses the traditional boundaries between academic disciplines and schools of thought. We provide strategic advice and practical guidance based on rigorous, stakeholder informed research. We are also supported by a worldwide network of partners from policy, government, industry and academia.

For more information about our research, teaching and advocacy, please contact: Professor Dilanthi Amaratunga & Professor Richard Haigh, Global Centre for Disaster Resilience, University of Huddersfield, Queensgate, Huddersfield, HD1 3DH, United Kingdom.

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Keynote speakers

Professor Suzanne Wilkinson

Professor in Construction Management, School of Built Environment, and Associate Dean (Research), College of Sciences, Massey University, New Zealand

I am a Professor in Construction Management, in the School of Built Environment and Associate Dean (Research), College of Sciences, Massey University. I have a PhD in Construction Management, a BEng (Hons) Civil Engineering, Graduate Diploma in Business Studies. My research focuses on climate mitigation, resilience, disaster management, construction innovation and smart cities. I am interested in how cities, communities and organisations plan for, and manage, hazard events and how cities, communities and organisations rebuild and recover. I have been an advisor to organisations on resilience building and disaster recovery (Auckland Council, Government Agencies (NZ) and Hunter Water in Australia). PI/Research Lead for a recent 5-year, $10 million NZD project, on creating capacity and capability for the construction sector and recently completed a 4million NZD PI role for the New Zealand National Science Challenge: Resilience to Nature's Challenges. Published over 300 research papers, co-written 3 books, including Resilient Post Disaster Recovery Through Building Back Better (Routledge 2019). Supervised over 40 PhD students.

Synopsis

In this talk I will be developing ideas for creating a resilient construction sector. Based on research on disaster recovery and resilience building, this paper will outline the key elements to creating a resilient construction sector, including at organizational and sector level. Past case studies of the role of construction in building back better highlight what can be done now to ensure disasters are not so impactful and recovery is quicker. Shocks and stresses testing the construction sector will be presented. The talk will conclude with some lessons for the sector in understanding their role in disaster recovery, resilience building and reconstruction.

Dr Abhilash Panda

Deputy Chief of Intergovernmental Processes, Interagency Cooperation and Partnerships Branch, The United Nations Office for Disaster Risk Reduction (UNDRR)

Dr Abhilash Panda is the Deputy Chief of Intergovernmental processes, Interagency cooperation and Partnerships Branch and oversees the work of UNDRR in the areas of financing risk prevention, de-risking investment, resilience of infrastructure, build back better and support to G20's DRR working group. He has more than 17 years of experience in international development, crisis management, business continuity, humanitarian response, investment portfolios and sustainable development. Abhilash joined the United Nations in 2003 and has served in various capacities, managing large scale multi-country teams and global initiatives to build economic, social and strategic resilience. Abhilash holds a PhD from University of Huddersfield (UK), Master's in Business Administration and Bachelors in Electronics & Telecomm Engineering.

Synopsis

Disasters, with their ability to kill, injure and destroy economies, are becoming a clear and present threat to global prosperity. And unfortunately, across the world, we are seeing that the drivers of disaster risk are growing unabated.

This was one of the findings of the global Midterm Review of the Sendai Framework for Disaster Risk Reduction, which is the global blueprint for how countries can reduce their disaster risks and losses.

There are many drivers of disaster risk, but climate change stands alone as one of the largest.

Climate-driven risks are becoming increasingly complex and more difficult to manage. And the impacts of these risks often cascade across sectors and countries. One example is disaster displacement. Last year, over 60 million people were displaced globally, half of whom, were displaced by climate-related disasters.

So what can be done to reduce the impact of climatic and non-climatic disasters?

We believe a lot can be done. Hazards alone do not trigger disasters – it is only when hazards impact populations that are exposed and vulnerable do they lead to disasters. Hence, countries can stop disasters if they understand their risks and then act on them decisively. This requires proper planning and funding for implementation.

The second key step is ensuring adequate funding. Plans are only useful if they are implemented,

and this requires funding. For many countries, this usually means allocating a larger portion of the budgets to disaster risk reduction and mainstreaming it into all investment decisions. For the least developed countries, this means ensuring international assistance is increased and directed to building resilience. For countries in fragile situations, this could include the use of special funding pathways to kickstart pipelines of projects with dual resilience and security benefits.

Thirdly, resilience doesn't just happen because we all agree it should. Turning our commitments and pledges into concrete actions requires strong leadership, sharing good practices, effective regulations, and efficient partnership.

Interconnections between science, technology, policy, and the private sector is such a partnership. Operationalizing this nexus is crucial to ensuring that development decisions, whether by the public or private sectors, are informed by a solid understanding of risks based on the best scientific research and evidence. Failure to do so would lead to the creation of new risks, exacerbate existing ones, and undermine sustainable development at all levels.

We must strengthen the connections between decision-makers, the scientific community, and the private sector. Because disaster risk reduction is a shared responsibility and requires collective efforts.

We must break this cycle of inequality, disaster, repeat.

Special Plenaries

Learning in thought and practice - how far do coproduced research projects really enable critical learning? Lessons from the Tomorrow's Cities project

Moderated by

Dr Tanvi Deshpande

London School of Economics and Political Science

Session outline

1. Introduction by Dr Tanvi Deshpande, *London School of Economics and Political Science.*

2. Panel: Learning across a large interdisciplinary coproduced project: Tomorrow's Cities by Dr Max Hope, *Leeds Beckett University, and Ekin Ekici, Boğaziçi University.*

3. Panel: Active learning by Dr Tanvi Deshpande, *London School of Economics and Political Science.*

4. Panel: The social context for learning by Dr Dilli Poudel, S*outh Asia Institute of Advanced Studies.*

5. Plenary discussion on Learning Together facilitated by Prof. Mark Pelling, *University College London,* and Dr Tanvi Deshpande, *London School of Economics and Political Science.*

6. Conclusion by Prof. Mark Pelling, *University College London.*

Session details

Presentations in this session unpack the learning processes and outcomes of the Tomorrow's Cities methodology. The key themes/ topics and issues discussed in this session include the learning framework and its practical implications on relevant stakeholders. Learnings of a mega UKRI and GCRF funded interdisciplinary risk reduction project can facilitate agenda setting and framing future disaster research projects. The session begins with an introduction of the key aims and structure of the session which draws together partners from the UKRI-GCRF Tomorrow's Cities project, and through this, opens a discussion on the ways in which learning is shaped and enabled or foreclosed by research practice.

Learning across a large interdisciplinary coproduced project: Tomorrow's Cities: This panel will discuss the Tomorrow's Cities project and the learnings of this large interdisciplinary, co-produced, impact-oriented project. The learnings of the project are mapped on a spectrum from incremental (single loop) to transformative (triple loop) learning, and this framework is used to analyse and evaluate learning across the project. The framework is used to explore 'who learns', 'what is learnt', 'how learning happens', 'how learning is shared and consolidated', and 'learning gaps' and identify when project learning supports and perpetuates 'business as usual', and when it opens a space to challenge and transform taken for granted values and ways of doing things. This gives insight into the learnings of different Tomorrow's Cities participants (e.g. city teams and the international scientific community), and helps unpack the overall impact of the project.

Active learning: This panel unpacks the learnings across Tomorrow's Cities which are realised more

explicitly towards the end of the methodology. We anticipate some active learnings emerging from the hub. These comprise of i. technical learnings (quantitative understanding of the performance of decision-making through concrete impact measurements), ii. policy learnings (drawing connections between policy decision and the risk-performance of desired future cities) and iii. social learnings (balancing aspirations and desired future assets with the needs to reduce risk in an equitable way, thinking of implementation challenges and potential solutions). These three types of learnings are interconnected and facilitate an iteration loop of the methodology. Additionally, these learnings lead to consolidation (through action planning and institutionalisation) at the end of the project. Beyond these tangible learning outcomes there are several intangible learnings (e.g. shared understanding of risk, confidence in the computational model and inclusive planning process), which will vary for the different stakeholders engaging with the Tomorrow's Cities methodology.

The social context for learning: This panel will consider the ways in which learning has taken place and been experienced from the perspective of participants in a coproduced research project. It will consider the role of social position - economic, social and political power - in enabling and constraining 'learning' as both a reflection on existing beliefs and practice and on the identification of actional outcomes. The paper draws from experience from an urban development and risk reduction futures project (Tomorrow's Cities) deployment in Rapti, Nepal.

Learning together: We would like reflections on our framework of analysing learnings of an interdisciplinary, co-produced, impact-oriented project. The audience of this session will break into smaller groups to reflect on some key questions.

The session concludes with a wrap up of the session on 'Learning trajectory of Tomorrow's Cities'.

Disasters, inclusion, and justice in the climate negotiations: Reflecting on COP28

Moderated by

Professor Mark Pelling

Institute for Risk and Disaster Reduction, University College London

Session outline

This session will reflect on the 28th meeting of the UN Convention for Climate Change (COP28) taking place in Dubai 30 November-12 December 2023, and will be of interest to anyone interested in the intersection of climate change and disasters. The chair will begin by providing their reflections on the COP and its outcomes, before the speaker will provide an overall reflection on how the COP engaged with the themes of disaster risk, inclusion, and justice. The session will also include a wider discussion on what lessons can be learned from COP28 for disaster research.

1. Chair's welcome and reflections by Professor Mark Pelling, *Institute for Risk and Disaster Reduction, University College London.*

2. Presentation and reflections by Dr Marie Aronsson-Storrier, *School of Law, University College Cork.*

3. Discussion moderated by Professor Mark Pelling, *Institute for Risk and Disaster Reduction, University College London.*

Session details

This session will offer some rapid reflections on the 28th meeting of the UN Convention for Climate Change (COP28) taking place in Dubai 30 November-12 December 2023. COP28 will mark the conclusion of the 'Global Stocktake' measuring the progress made under the Paris Agreement 2015 and map the path forward.

The chair will begin by providing their reflections on the COP and its outcomes. The speaker will then provide an overall reflection on how the COP – including its organisation and its outcome documents – engaged with the themes of disaster risk, inclusion and justice. Particular attention will be paid to disaster risk creation and the inclusion of marginalised and counterhegemonic voices – including voices from the Most Affected People and Areas – in the decision-making processes, as well as the developments concerning the Loss and Damage fund agreed upon at COP27. The speaker will also present preliminary findings from her own research on inclusive participation in international law-making conducted while attending the second week COP28. For the final part of the session, the chair will open up for a wider discussion on what lessons can be learned from COP28 for disaster research, in the UK and beyond.

Sharing the Global Shelter Cluster Research Agenda

Moderated by

Dr Lizzie Babister

Global Shelter Cluster / Habitat for Humanity International

Session outline

The GSC Research Agenda currently has three priority themes: Long Term Recovery, Cash and Markets Assistance and the Wider Impacts of Shelter and Settlements. These themes describe the research priorities of humanitarian practitioners engaged in the coordination of humanitarian response, based on analysis of data collected across 42 countries from 20 Cluster Coordinators and 11 member organisations of the Global Shelter Cluster Strategic Advisory Group (SAG). We have commissioned both global and country-specific research focused on these themes. The research agenda is now at the next stage where we will be asking humanitarian practitioners to contribute more specific research questions to share with research partners. In the meantime, we are looking for research partners with a track record of working with the humanitarian community who are interested and able to engage in research which is relevant to our agenda.

1. Introduction to the Global Shelter Cluster (GSC) and background to the GSC Research Agenda

2. Presentations by the panellists:

   - Dr Lizzie Babister, *Global Shelter Cluster / Habitat for Humanity International.*

   - Charles Parrack, *Oxford Brookes University, Centre for Development and Emergency Practice.*

   - Sue Webb, *CARE International UK / Oxford Brookes University, Centre for Development and Emergency Practice.*

   - Janina Engler-Williams, *CARE International UK.*

   - Jenny Weatherall, *Catholic Relief Services (CRS).*

3. Q&A.

Session description

The goal of the panel is to raise awareness about the GSC Research Agenda. The objectives are to share the research work of GSC partners and to provide an opportunity to discuss the process of coproduction of research in a humanitarian crisis context. The panel will present work on how practitioners support relief to recovery, how households self-recover, the relationship between health and shelter and settlements, and the measurement of humanitarian impact. The panel will discuss the role of research in informing decision-making, investment and behaviour in humanitarian crisis contexts, concerning the loss and recovery of shelter and settlements. The research to be discussed has been commissioned to fill gaps in the evidence base for shelter and settlements in humanitarian crises identified by practitioners and researchers working in humanitarian crises.

Lunchtime Discussion: Disability Inclusion in DRR - Reflections on the UNDRR Disability Report 2023

Moderated by:

Abigail Ewen

University College London

Session outline

1. Introductions and welcome - Including an introduction to the UNDRR report findings and current landscape of disability inclusive DRR.

2. Reflections on facilitating a disability inclusive research environment.

3. Brainstorming sessions in Small Groups – Barriers and challenges to Disability Inclusion, and solutions.

4. Open Discussion - Open discussion for reflections and questions.

Session details

A recent UNDRR Global Survey Report on disability inclusion in DRR concluded that there has been limited progress in disability inclusion in the last ten years, with no significant differences across all the 132 countries included in the report (UNDRR, 2023). This lunch time session hopes to create a space for learning, reflection and debate on disability inclusion in DRR and is suitable for disaster practitioners or researchers with an interest in inclusive disaster risk reduction or how to facilitate inclusive environments in disaster risk reduction research. The session will discuss the current landscape of inclusive DRR, reflecting on the recent literature such as the UNDRR Global Disability Survey. The goal of the session is to map the barriers and gaps to facilitating inclusion in DRR as well as brainstorm potential solutions and strategies to inclusive DRR. The session will be held in a fairly informal and discursive manner and with include activities to get participants to reflect on inclusive DRR and how it relates to their own research or work in disaster risk reduction.

Early Career Researcher (ECR) Professional Development Programme

We recognise the importance of supporting ECRs in their professional development. At the UKADR 2023 conference, we provide opportunities tailored to the unique needs of ECRs under the theme of "Early Career Development Pathways."

Join us at UKADR 2023 to explore these initiatives and connect with a supportive community of early career researchers. Together, let's nurture your professional growth and contribute to the advancement of disaster research.

15th December 2023, 09.00 – 11.00 GMT/UTC, online

Session outline

Time	Topic	Speaker
09.00 – 09.10	Welcome and introduction to the UKADR ECR network	Dr Mark-Ashley Parry *Northumbria University*
09.10 – 09:40	Research grants	Professor Mark Pelling *UCL*
09:40 – 10:10	Building your research profile	Professor Dilanthi Amaratunga *University of Huddersfield*
10.10 – 10.15	Break	
10.15 – 11.00	Panel discussion with experienced researchers and ECRs on all aspects that contribute in a broad sense to the future of the DRR research field	*Moderated by* Dr Mark-Ashley Parry *Northumbria University* *Panellists* Professor Richard Haigh *University of Huddersfield* Dr Peter McGowran *Oxford Brookes University* Malith Senevirathne *University of Huddersfield* Dr Ezri Hayat *University of Huddersfield* Dr Chamindi Malalgoda *University of Huddersfield*
11.00	Close	

Speakers

Professor Mark Pelling, UCL

Research grants: Current grant funding landscape and its pressures, including a range of funding mechanisms and key elements in drafting a grant proposal.

Professor Dilanthi Amaratunga, University of Huddersfield, UK

Building your research profile: The importance of raising your profile, including why do we want to build a profile and how we can achieve it.

Panel discussion

The panel discussion focuses on the challenges facing early career researchers and aims to provide a platform for in-depth exploration and discussion of the obstacles encountered by those beginning their careers in academia.

The purpose of this panel is to:

1. Identify and highlight the diverse range of challenges early career researchers face, such as securing funding, navigating academia's competitive landscape, maintaining work-life balance, dealing with mental health issues, and adapting to the impact of events like the COVID-19 pandemic.

2. Share insights, experiences, and practical advice from experienced researchers, mentors, and industry professionals to help early career researchers overcome these challenges and build successful careers.

3. Discuss strategies for institutions, academia, and the research community to better support and empower early career researchers through mentorship programs, improved resources, funding opportunities, and fostering an inclusive and diverse research environment.

4. Examine the role of interdisciplinary research, effective communication, networking, and the evolving technological landscape in shaping the career paths of early career researchers.

ECR Networking

19th December 2023, 12.00-13.00 GMT

In-person, Oastler Building, University of Huddersfield, UK

Join us during the conference for a dedicated ECR networking event. Led by Dr Mark-Ashley Parry, Northumbria University, UK.

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Book of Abstracts

Theme 1:

Risk Governance – Citizen Involvement

Evaluation of Multi-Level Governance of Disaster Risk Management in Malaysia

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Abstract

Malaysia's governance system is characterised by a complex hierarchy, encompassing various levels of authority, such as the federal government, federal territories, state governments, and local authorities. When it comes to disaster management, the nation has historically adhered to a top-down, government-centric approach, exemplified by the establishment of Directive No. 20 by the National Security Council in 1997, aimed at addressing natural hazards. Despite these efforts, the country faced a catastrophic ordeal during the 2014/15 floods, which were the most severe in decades, resulting in significant loss of life and the displacement of countless families. This study undertakes a critical evaluation of Malaysia's multi-level governance system for disaster management, pinpointing its inherent deficiencies.

In pursuit of a comprehensive assessment, this research employs semi-structured interviews with 20 key stakeholders during the 2016/17 period to thoroughly analyse Malaysia's disaster management structure and policies. The investigation reveals glaring inadequacies within Directive No. 20, primarily stemming from its lack of comprehensive planning and the absence of effective mitigation strategies. When the floods struck, an alarming lack of coordination and inefficient distribution of aid between federal and state government departments became glaringly apparent. The intricacies of political interests and policy disparities among ruling parties further exacerbated decision-making processes. Additionally, constrained capacity and limited resources at the district level detrimentally impacted communities, forcing them into prolonged stays in temporary shelters.

This study underscores the pressing need for proactive measures and systemic reforms within Malaysia's multi-level governance structure. Policymakers must confront the identified shortcomings head-on to bolster disaster risk management within the country. The findings of this research contribute substantially to our comprehension of disaster management, underscoring the imperative nature of addressing the identified issues to fortify risk management in Malaysia, safeguarding its population and resources in the face of future disasters.

Emergency Response Collaboration: A Conceptual Model for Multi-Agency Knowledge Sharing to Support Front Line Personnel

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Keywords: ***Collaboration, Community Resilience, Crisis Management, Knowledge Sharing***

Abstract

Large scale incidents require multi-agency engagement to help make the public safe and protect property. While some relationships between agencies do exist (LRF, CONOPS, MAIP) and aim to align with the five principles for joint working, inefficiencies delivering optimal services exist. Gaps in multi-agency strategy can lead to information required by front line personnel not being readily available, particularly for voluntary or other support agencies. Thus, leading to situational awareness being limited to certain partners. Rapid response requirements mean there is a need for different stakeholders to communicate and collaborate. Thus, common information that is capable of being used under differing circumstances becomes ever more important.

Disasters tend to beget disasters e.g., people left homeless after a flood or hurricane. This research aims to address this problem by a) introducing a conceptual model to improve knowledge flow between agencies and, b) introduction of a conceptual, decontextualised Knowledge Asset (a block of sharable information) making information available to all agencies. Introducing knowledge assets may offer a solution to the problem of reliable information sharing and overcome a general lack of consistency.

This empirical research adopts a qualitative strategy of inquiry to collect and analyse data. A semi-structured questionnaire survey was adopted as the research instrument to collect data from 11 Local Resilience Forums (LRF) across the UK.

Results from the study establish that current data sharing protocols are inadequate, not considering the needs of partner organisations. This includes voluntary organisations at local, regional and national levels. Findings also establish a lack of clarity regarding sharing information with international partners for large scale incidents.

The conclusion discusses key issues emerging, before establishing the conceptual model, offering a theoretical contribution, and addressing gaps and opportunities for further research. Contributions to practice are also highlighted along with a discussion on their potential application.

UKADR ABS-2023-015

Empowering Vulnerable Communities: A Path to Inclusive Risk Communication by Civil Protection Authorities

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Abstract

Recent research findings have indicated that civil protection authorities (CPAs) face multiple challenges in developing accessible, actionable, and comprehensible risk communication for vulnerable populations. These gaps in risk communication can further reduce vulnerable populations' ability to mitigate disaster risk and prepare for, respond to, and recover from disaster events. The aim of this study is to identify the operational barriers CPAs encounter in developing vulnerability informed strategies to inclusive risk communication. The study's CPA focused approach introduces a relatively novel perspective in the field of inclusive risk communication research. The study uses a scoping method to review relevant literature at the intersection of inclusive risk communication, vulnerability, and community engagement. Evidence was also drawn from 20 CPA interviews conducted in Italy, Israel, Greece, Belgium, and the UK during the RiskPACC EU project, which described European disaster risk management and risk communication practices, as well as their community relations. The study found that CPA barriers to inclusive risk communication arise from the current unidirectional, top-down communication practices and governance strategies employed by CPAs. These structures limit CPA ability to identify vulnerable populations and their needs, which also inhibits generating political will and resources to engage with vulnerable populations. The study proposes a community engagement approach for challenging top-down strategies and CPA perceptions of vulnerability. Community engagement provides an inclusive platform for CPAs to consult and communicate with their communities. Furthermore, it fosters collaboration between CPAs and civil society organisations, and adopts a co-creation approach to risk communication. Leveraging community knowledge can empower CPAs to pursue inclusive and effective communication strategies informed by intersectional approaches to vulnerability. The study concludes by advocating for intersectional approaches and community engagement in disaster risk management, and their unmatched capacity to build community resilience to disaster events.

UKADR ABS-2023-027

Gender and Resilience in the Overlooked City

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Abstract

The importance of attending to gender (not only women) in policy efforts and in academically overlooked, small urbanising cities is critical to our understanding of DRR and development. Gender, caste, class struggles matter in Bharatpur, Nepal. The local authorities and residents are learning how to govern and live in a space where relationships are changing. There are two particular gendered groups that function on a neighbourhood level. Mothers' groups provide invisible, community resilience in the form of social infrastructures. They experience slow violence by patriarchal power structures who will not allow them to be more than resilient. Meanwhile, by participating in neighbourhood groups, certain men (particularly high caste and affluent) are allowed to rework the urban and fulfil their aspirations for physical infrastructure in the form of paved roads in a new state grey space controlled by the local authority. The experiences of mothers' groups, neighbourhood groups, governmental officials and international development projects show who has power, who is kept invisible to whom and who can create the city in their imaginary. This has implications for DRR and climate change interventions.

UKADR ABS-2023-086

Public Participation for Disaster Risk Reduction in Nepal: Gap between Rhetoric and Practice

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Abstract

This research examines the participatory nature of Disaster Risk Reduction (DRR) initiatives in Nepal using a Policy Arrangement Approach (PAA). Despite the widespread use of participatory language, the study found limited actual changes in practices. Local governments rely on Non-Government Organizations (NGOs) to mediate public participation in DRR. Participatory processes often begin after projects have been externally designed, primarily serving to legitimise pre-determined decisions. Decision-making remains top-down, influenced by unequal power dynamics. DRR practitioners face challenges due to social norms, gendered roles, and elite-dominated structures. Additionally, DRR projects often disregard the local context. Overall, there is a gap between rhetoric and practice, hindering genuine public participation in DRR.

UKADR ABS-2023-104

Theme 2:

Risk Governance – Climate Resilience

Disasters, Poverty and Climate Change – Who is Responsible? Competing Narratives of Suffering and the Excuses of the Powerful

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Abstract

The climate crisis is at the intersection of two sets of injustice. The first is the obvious one, concerning the businesses and governments (historically in the West) that have caused the majority of carbon emissions that affect the majority of people in the world who have played little or no part in causing it yet experience the worst of its impacts.

The second is less obvious. Most of those same people who are badly affected by climate change are already poor and vulnerable. They live within unjust systems of power that reduce their access to resources and production assets, income and welfare. The conventional way that organisations and academics deal with this is the idea that climate change is an intensifier or magnifier of existing disaster risks through rising poverty, vulnerability and inequality. But this avoids the need to analyse the causes of their poverty and vulnerability. These are the results of systems of power that allocates resources and income unfairly. If climate change is thought of simply as a magnifier of existing poverty and vulnerability, the causes tend to be disguised and effectively forgotten.

Governments of the 'global South' willingly emphasise the first injustice to avoid taking responsibility for the second. "Donors" (including the World Bank, Asian Development Bank) from the 'global North' join in this game. They do not want to comment on the causes of poverty and vulnerability in India and other countries that suffer, because of their alliances with the governments. And yet it should be clear that dealing with climate change injustice without reducing or even eradicating existing causes of poverty and vulnerability is completely meaningless.

Understanding Diverse Imaginaries of Risk in Chile and Argentina: Bringing Different Knowledges Together

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Keywords: ***Volcanoes, Climate Change, Imaginaries, Knowledges***

Abstract

This talk will discuss examples from recent work in Chile and Argentina that has sought to understand how local people live with volcanoes and rapid climate change. It uses the concepts of imaginaries and geographical imaginations to advocate a place-based approach to understanding risk in context, alongside community knowledges. A geographical imaginations approach is underlain by an ethic of care which seeks to work alongside communities, stakeholders, officials and scientists without privileging one form of knowledge over another, and accounting for multiple forms and definitions of risk from environmental hazards.

This paper is based on research currently being carried out in South America, in volcanic areas that are experiencing rapid climate change in Chile, Argentina and Peru. The research seeks to work with nodal agencies and non-state organisations as well as communities to understand imaginaries and drivers of risk holistically. Risk may be systemic, but it also has very specific place-based attributes, including the memorialisation of past disasters, historical trajectories and power imbalances, diverse value systems and complex politics around the earth system itself.

UKADR ABS-2023-038

A Qualitative Study of Climate Change Adaptation, Disaster Risk Reduction and Policy Integration in Lagos and Delta States of Nigeria

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Keywords: ***Coastal Resilience, Disaster Risk Reduction, Integration, Nigeria***

Abstract

Coastal–urban areas are faced with numerous challenges of extreme weather conditions including flooding, storm surge, erosion, and sea level rise. Additionally, coastal-urban areas are exposed to risks of physical damage to infrastructures, loss of lives and degradation to the immediate environment. Numerous problems including those mentioned above have resulted in inconsistencies in policy formulation and implementation in Nigeria. However, the integration of climate change adaptation and disaster risk reduction strategies at institutional and ministerial levels appear to be non-viable due to the fact that they are often fragmented; these therefore require integrated, cross–ministerial, policy interventions in Nigeria. This study aims to examine multi–state, cross–ministerial, policy integration in addressing climate change and disaster risk related issues in selected states. A comprehensive multiple case study approach conducted in the coastal-urban areas of Nigeria was employed with the units of analysis revolving around the domains of climate change adaptation, disaster risk reduction and critical aspect of policy integration. It specifically centred on the Southern geo-political zone, which spans across two states (Lagos and Delta) and two key ministries (Health & Social Welfare and Environment & Ecological Management). Qualitative semi-structured interview schedules were developed and administered initially to the categories of stakeholders. Additional numbers were administered inter–ministerially in the selected states for multiple case study. The data collected and analysed assisted in enhancing the units of analysis and gave insights to policy implications. Drawing from the expertise of 17 interviewees and in-depth key informant interviews of 14 government officials, the results from the analysis indicated emerging themes: inter-ministerial collaborations, pandemic preparedness and response, challenges and barriers of integration as well as integrated data information. These were central and common to the states and ministries, and beneficial to overall decision - making process in Nigeria.

Trust, Truth, The Nihilistic State and Disaster Risk Reduction in the 21st Century

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Abstract

The functionality of all societies today relies upon public trust in the institutions that govern them. However, trust in these institutions has been declining, especially in the Western world, leading to what is known as 'truth decay.' It is argued that this decay is attributed to the rise of social media and the widespread exposure of the general population to misinformation and disinformation through these channels. Reports during the 2016 and 2020 U.S. presidential elections, the COVID-19 pandemic, and the climate crisis highlighted a significant amount of misinformation circulating on various social media platforms. This misinformation, combined with echo chambers on social media, is arguably fostering the development of nihilistic attitudes within society.

This paper utilizes secondary data from various sources, predominantly YouGov, for its analysis. Basic analysis of the data was conducted, such as demonstrating percentages and employing chi-squared tests to determine significant differences. Additionally, content analysis of tweets was undertaken to showcase examples of misinformation about the health sector, such as tweets falsely linking vaccines to autism, notably the MMR vaccine and the COVID-19 pandemic.

The argument posited here is that when a substantial portion of a population exhibits such traits, a 'nihilistic state' emerges. This nihilistic condition has been demonstrated to undermine efforts aimed at controlling the COVID-19 pandemic and reducing fatality rates. Furthermore, the proliferation of nihilistic attitudes could severely impede Disaster Risk Reduction effectiveness in managing future pandemics, addressing climate change, and preparing for/responding to various natural hazards. For instance, a growing number of people believing in the adverse effects of vaccines could lead to the resurgence of old endemic diseases and prolong the duration and impact of future pandemics. This scenario has been observed in the UK, where a decline in MMR vaccine uptake, especially in London, has increased the risk of a measles outbreak in the near future, as reported by the UK Health Security Agency (UKHSA)."

MEDiate Project Stakeholders' Engagement: Reflections after the First Participatory Research Action Cycle

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Abstract

Climate change-induced disasters and multi-hazard with their cascading impacts challenge communities, businesses, infrastructure owners and local and national policymakers because of their complexity and changing trends. It is time researchers work together with stakeholders to develop disaster resilience strategies. For this reason, the Horizon Europe project MEDiate applies the Participatory Action Research (PAR) method to develop a Decision-Support System (DDS) for risk assessment and disaster management based on stakeholders' needs. The project includes three Participatory Action Research cycles to co-develop and co-evaluate features and approaches behind the Decision-Support System. Stakeholders from four testbeds across Europe are involved in the PAR: Essex (UK), Oslo (NO), Nice (FR) and Austurbrú (IS). Each PAR cycle sees a series of meetings among the stakeholders facilitated by a leading stakeholder using a protocol defined by scientists. Meetings between the leading stakeholders and scientists follow to review and implement stakeholders' requirements and indications into the DDS and reflect on the implemented changes. Within the first PAR cycle, the meetings among stakeholders aimed to identify the climate-change hazards that most challenge a city or region (testbed) and establish the priorities in risk assessment; whilst the meetings between stakeholders and scientists intended to define the methodology currently used in a testbed to assess the risk and resilience to the challenging hazards. The modified DDS and the reflections of a preceding cycle are the starting points of the following cycle. After one year of the MEDiate project, the first PAR cycle was completed, and three main reflections were drawn. Firstly, the hazards identified by the scientists as critical are less critical according to the stakeholders' perspective. Further, the stakeholders understand the complexity of cascading and compounding hazards and identify the complex impact on elements and services of the built environment. Finally, the risk and resilience assessments currently implemented in several countries are very similar to each other. These reflections produced a change in hazard maps used for the DDS, triggered a comparative analysis of indicators to measure the risk and losses and confirmed the DDS framework to assess risk and resilience to climate change-induced disasters.

A Collaborative Approach for Developing Climate Adaptation Strategies for Companies

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Abstract

Previous studies on corporate climate change adaptation have indicated a predominantly reactive approach, due to climate risks often being relegated as a residual issue in the corporate risk management process, resulting in limited proactive engagement from management. Nevertheless, companies operating in climate-vulnerable industries and regions will have to respond to the inevitable consequences of climate change. Consequently, there is a compelling need for research to facilitate proactive climate change adaptation, and collaborations with multiple stakeholders have been frequently highlighted as a means for achieving this. As such, this study aims to understand gaps in the literature and potential research directions on collaborative mechanisms for climate change adaptation of companies. To achieve this, a descriptive literature review on Scopus was conducted by combining key concepts, climate change, corporate sector, and collaborations. Several keywords indicative of these key concepts were used as search criteria. Studies published from the year 2000 onwards were included as the importance of partnerships was highlighted following the introduction of the Millenium Development Goals in 2000. Articles that focused on companies were selected to be reviewed based on the abstracts. The findings highlighted that studies focusing on collaborative mechanisms for corporate adaptation to climate change are fragmented. This field represents an emerging research area with limited conceptual and empirical investigations. The majority of the studies reviewed focused on involving companies in broader development initiatives or enhancing community adaptation through Corporate Social Responsibility (CSR) or Public-Private Partnerships (PPP). Furthermore, there was a noticeable dearth of research pertaining to companies located in developing countries, particularly the Asian region that is disproportionately affected by climate change. Therefore, researchers have much room to explore collaborations or the institutional environment for advancing the climate resilience of a company's operations, to conceptualize collective mechanisms for proactive adaptation to climate risks.

Theme 3:

Risk Governance – Public Health

Healthcare Resilience - A Meta-Narrative Systematic Review and Synthesis of Reviews

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Keywords: ***Healthcare Resilience, Health Systems, Global Health, COVID19***

Abstract

The COVID19 pandemic has tested global healthcare resilience. Many countries previously considered "resilient" have performed poorly. Available organisational and system frameworks tend to focus heavily on physical capacities. This study aims to explore and synthesise evidence about healthcare resilience and present a unified definition and framework for future resilience-building.

We performed a systematic review and synthesis of reviews using a meta-narrative approach, adhering to RAMSES and PRISMA guidelines. We included reviews published in peer-reviewed academic journals, related to healthcare, from 2008 – 2022. Papers that were non-English, or focused on individual resilience, or specific disease outside of epidemic or pandemic contexts, were excluded. Modified three-stage screening was performed. Quality was appraised using the Joanna Briggs Institute checklist for systematic reviews. We utilised an inductive approach and performed three-tiered coding around the three foci of definitions, concepts, and measures. Results were used to synthesise an interdisciplinary, cross-sectoral, and multi-level definition and framework.

The main paradigms within healthcare resilience include global health, disaster risk reduction, emergency management, patient safety, and public health. Definitions of healthcare resilience recognise various hierarchical levels: individual (micro), facility or organisation (meso), health system (macro), and planetary or international (meta). There has been a shift from a focus on mainly disasters and crises, to an "all-hazards" approach to resilience. Attempts to measure resilience have met with limited success. We analysed key concepts to build a framework for healthcare resilience containing pre-, intra-, post-, and trans-event domains. Alongside, we synthesise a definition which dovetails with our framework.

Resilience increasingly takes an all-hazards approach and a process-oriented perspective. There is increasing recognition of the relational aspects of resilience. Few frameworks incorporate these, and they are difficult to capture within measurement systems. We need to understand how resilience works across hierarchical levels, and how competing priorities may affect overall resilience.

UKADR ABS-2023-018

Community Resilience in Times of Crisis: Managing Household Waste During the COVID-19 Pandemic - A Case Study of Ovita Low-Income Settlement in Dehiwala-Mt. Lavinia Municipal Council Area, Colombo, Sri Lanka

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Abstract

The COVID-19 pandemic posed an array of challenges to the Global North and South, including Sri Lanka that range from economic hardships to strained social relations and diminished quality of life. This study delves into the realm of community resilience in the face of a biological disaster, with a specific focus on household waste management in the Ovita low-income settlement within the Dehiwala-Mt. Lavinia Municipal Council. Data were collected from the settlement using a structured questionnaire with 300 respondents and 50 key informant interviews. Quantitative data from the questionnaire were analysed using univariate and bi-variate analytical methods in the Statistical Package for Social Sciences, while qualitative data were analysed using thematic analysis. The findings revealed significant challenges that households faced during the COVID-19 period, particularly during government-sanctioned lockdowns. Over 89% of respondents reported disruptions in formal municipal solid waste management activities due to waste workers being infected with the virus, transport difficulties, and fear of infection. Additionally, 30% stated that local councils discriminated against the settlement, prioritising waste collection in middle and high-income areas. Consequently, over 57% of respondents resorted to burning household waste, including medical waste like masks, gloves, and sanitiser bottles. Another 27% used the services of drug addicts in the area to dispose of household waste for a fee. Moreover, 11% employed composting to manage biodegradable waste, while 5% disposed of household waste in the canal running through the settlement. Formal waste management activities resumed four weeks after the first lockdown but involved collecting mixed waste from households, rendering residents' segregation efforts ineffective. The study revealed that residents of the Ovita settlement had shown great resilience by devising innovative ways to manage household waste. Nevertheless, they had not developed sustainable methods to manage waste in a future biological disaster, leaving them vulnerable to similar or worse challenges.

Health System Continuity and Resilience Planning with Workforce Scenario Simulation Modelling in Emerging Infectious Disease Disasters

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Keywords: **Emerging Infectious Diseases, Business Continuity, Resilience, Simulation**

Abstract

This study examined the strategic management challenges of emerging infectious disease disaster preparedness and response in healthcare organisations in the context of COVID-19 in Korea and developed a scenario simulation model to compare business continuity and resilience strategies. Through interviews with 95 pandemic response managers and a survey of 1000 healthcare professionals and 45 organisations, we analysed the complex interrelationships of healthcare continuity and resilience issues in the context of an infectious disease disaster. We then developed a scenario simulation model that incorporated the complexities of infectious disease spread, resource availability, allocation and continuity objectives and ran what-if simulations. The model focused on optimising human resource management and safety, the most important factor in health system response and resilience to infectious disease disasters. Based on the International Organisation for Standardisation (ISO) concept of business continuity, we defined health system continuity as the ability of a health system to continue to provide health services at an acceptable level after a functional disruption. We have defined health system resilience as the dynamic and strategic ability of an organisation to go beyond the scope of continuity planning to cover the period before, during and after a disruption. The goal of health system resilience is for an organisation to prepare, respond and transition to absorb the impact of disruption without causing significant damage to system operations. The simulation compared multi-strategy approaches for healthcare organisations to respond to a pandemic surge, including considering the capacity and availability of the healthcare workforce and prioritising key functions to ensure continuity of care.

UKADR ABS-2023-056

Integration of Public Health Considerations into Road Construction through Impact Assessment: Identifying Key Barriers and Enablers

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Abstract

Impact assessments are typically used to consider the implications of construction activity on people and their environment using a range of social, environmental and economic variables. Such assessments, including those used on road construction projects, seek to minimise their adverse effects and maximise positive impacts. Growing awareness of the significance of the wider determinants of health has led to various approaches being used to integrate public health and well-being into road construction projects. Examples include Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA). Despite the availability of such assessment tools, recent studies suggest that public health impacts on road construction projects are not adequately addressed in many developing countries. Similarly, this inadequacy was identified in the Sri Lankan context where road construction is a top priority for governments and significant funding agencies. Therefore, this study aimed to identify the key factors underpinning this inadequacy in road construction in the country. A thematic analysis was conducted using data collected from thirty semi-structured expert interviews and four case studies in Sri Lanka. This analysis identified four main categories of barriers and enablers for integrating public health into road construction projects in Sri Lanka: the different knowledge and conceptual understanding of health by different actors/stakeholders; the types of governance arrangements, in particular partnerships and the political context; the way institutions work, the responsibilities they have and their capacity and resources; and, the timeliness, comprehensiveness and inclusiveness of the appraisal process. The findings were used to draw out lessons on the governance and policy framework necessary to better integrate public health considerations into the planning and implementation of road construction projects, including through impact assessments such as EIAs and SIAs.

UKADR ABS-2023-074

Impact of Infodemic on Vaccine Hesitancy During a Public Health Emergency: Primary Insights of a Field Investigation Conducted in Sri Lanka on the COVID-19 Pandemic

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Keywords:** **COVID-19 Pandemic, Vaccine Hesitancy, Infodemic, Sri Lanka

Vaccine hesitancy refers to delay in acceptance or refusal of vaccines despite the availability of vaccination services. Many countries faced a larger number of challenges during the COVID-19 pandemic due to vaccine hesitancy which is primarily caused by the infodemic. The term infodemic refers to a large increase in the volume of information associated with a specific topic whose growth can occur exponentially in a short period of time due to a specific incident, such as the COVID-19 pandemic. The objective of this paper is to explore the impact of infodemic on vaccine hesitancy in Sri Lanka during the COVID-19 pandemic. A national-level survey was conducted to collect data from 3330 households in 9 districts. A digital questionnaire was used to collect data from households and 15 research assistants were involved in qualitative data collection using semi-structured interviews. Results highlighted that key determinants of vaccine delaying and rejection: fear of presumed side effects or adverse reactions, waiting to see the effectiveness, receiving damaging information about the impact of the vaccines, and being advised someone not to take the vaccines, are primarily connected with inadequate knowledge, which may be caused by lack of information. Misinformation and disinformation play a critical role in people's decision on vaccine acceptance, especially in resource-limited settings. Also, cross-checking vaccination-related information through unanimous social media posts and disseminating them among family members and peers was a critical determinant of vaccine acceptance, especially among young cohorts. Thoughts shared by anti-vaxxers have influenced the vaccine decisions of individuals whose information access is comparatively high. Overall, infodemic management seems a critical measure that the country needs to address during public health emergencies.

UKADR ABS-2023-088

Embedding Pandemic Preparedness in Local Disaster Risk Reduction Plans: Case of Covid Pandemic, Padnag City, Indonesia

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*Keywords: **Pandemic Preparedness, Localization, Disaster Risk Reduction***

Abstract

A Pandemic being a global biological hazard needs more strategic planning, awareness, capacities, and resources to contain and mange any outbreaks such as the recent COVID-19 outbreak. During the COVID-19 pandemic, despite the extent of its importance, countries have realised their lack of preparedness to handle a global pandemic that has resulted in millions of deaths worldwide. One of the main causal factors for this is the lack of capacities among local level stakeholders on pandemic preparedness and associated planning. Though there are international policies and frameworks such as Health Emergency Disaster Risk Management (HEDRM), there are gaps in translating these related policies into local level stakeholders' actions which has results them less prepared to face and manage pandemics within their locality. With this wider context, this study aimed to explore insights on several critical problems that need to be better understood in order to improve epidemic and pandemic preparedness, integration within the local level disaster risk reduction plans. Padang city in Indonesia was chosen as the case study. Padang is the capital city of the West Sumatra Province of Indonesia, and is inhabited by 1 million people, and is a metropolitan area which is one of the most prone to geophysical disasters in Indonesia. The study adopted a systematic literature review using academic data bases, and institutional reports, along with field work in Padang city, Indonesia using semi-structured interviews and several focus group discussions. Participants from the national and local level government and non-governmental organizations, and local communities were interviewed and also took part in the focus group discussions. Based on a thematic analysis, key findings were arrived at, which were mapped across ten thematic areas highlighted by the HEDRM framework, so that they can be adopted as part of wider local disaster risk reduction policies in Padang city. Lack of local level policies, lack of coordination, clear roles, and task distribution among stakeholders, resource and knowledge scarcities were some of the key challenges identified among many. To overcome these challenges, development of an integrated disaster management plan for Padang city along with a strong capacity building programme was highlighted as strategies that can be implemented, by both government and non-government stakeholders, in mainstreaming pandemic preparedness within the local disaster risk reduction in Padang city for making it resilient for future Pandemics.

Theme 4:

Post–Disaster Recovery and Reconstruction

Long-Term Evaluation of Impact of Humanitarian Post-Disaster Housing Assistance

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Keywords: **Evaluating Impact, Humanitarian Housing, Post-Disaster Recovery, Shelter**

Abstract

It has been recognised for some time that adequate post-disaster shelter has a positive impact on health, well-being, livelihoods and protection. However, long-term evaluations of the impacts of humanitarian sheltering are rare. This study aims to address this gap in the evidence base.

A study into understanding the impact of shelter programming, carried out through a research partnership between CARE International UK's humanitarian shelter team and the Centre for Development and Emergency Practice (CENDEP), Oxford Brookes University, will be presented. The presentation will draw on research in three country contexts: the Philippines ten years after super-typhoon Haiyan; Nepal eight years after the Ghorka earthquakes; and Afghanistan covering the twenty year period from 2001.

The research uses mixed methods with fieldwork in Nepal and Philippines and complementary desk research in all three countries. It was commissioned by USAID/BHA to inform learning within the sector generally. This review builds on CARE UK and CENDEP's track record in post-disaster research and further develops the connection between research and practice. An overview of the recovery pathways of the three contexts will be presented with a focus on relocation alternatives in the city of Tacloban, Philippines, and the diversity of challenges posed by the reconstruction efforts after the earthquake in Nepal. The challenges of responding to a broad range of shelter needs in the very difficult and changing context of Afghanistan will also be outlined. In each location, the longer-term impact of initial decision-making and programming is being explored as part of the ongoing research project. The project has also prompted an investigation into the topic of evaluating impact within the shelter sector; the report of a learning event held on the topic with and for humanitarian practitioners in May 2023 will be presented at the conference.

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Amplifying the Voices of Subalterns: A Regulated Flexibility Approach, Enabling Freedom for Community within Resettlement Processes

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Keywords: *Post-Disaster Resettlement, Landslide, Sri Lanka, Community Inclusion*

Abstract

This abstract summarises original research conducted at Ambadeniyawatta, a resettlement constructed following the 2016 catastrophic landslide event in Sri Lanka. The research is presented as an explanatory critique of the predominantly government-induced resettlement process while also exploring community engagement, either bestowed or pursued. In doing so, the research argues that the resonance of resettlers' voices must carry proportional weight alongside the authorities' decisions, especially in the complex landscape of Sri Lanka's resettlement challenges. This balance is essential not only to ensure economically viable outcomes but also to foster socio-cultural acceptance. The research builds and adapts the theoretical premises of Gonzalo Lizarralde's social justice framework and Duccio Turin's building construction model. The 'freedom for the community' in the resettlement process was researched by tracing the architecture of the place while allowing people to tell their resettlement stories. The method was guided by the parameters of opportunities to exercise freedom, the availability of choices, and the ability to exercise those choices during resettlement. Unveiling the flip side of resettlement processes, inquiry into people's opportunities sparked discussions, not only about different prospects but also about missed opportunities. Inquiry about choices prompted discussions about people's decisions in conjunction with their underlying motivations. Inquiry about the potential for and scope of those choices brought to light not just facilitators but also the impediments. The research highlights that community inclusion holds significance in delivering a needs-responsive resettlement outcome tailored to communities while also acknowledging Sri Lanka's practical administrative constraints. To that end, the research suggests a 'regulated flexibility approach' that strikes a balance between community inclusion and government-enforced regulation. Such an approach is anticipated to allow the community to modify the built environment at different resettlement phases while upholding a follow-up mechanism founded on tailored design and construction principles.

ID UKADR ABS-2023-005

Making Sense of Place: Exploring Attachment to Place in the Context of the Volcán de Tajogaite Eruption, La Palma (Canary Islands)

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Abstract

Volcanic eruptions are capable of causing immense destruction to urban areas, which can subsequently alter residents' attachment to the place. The eruption of Volcán de Tajogaite, La Palma, in September 2021 caused significant damage to urban areas in the west of the island. Two years after the eruption, some residents are still waiting to be re-housed or allowed to return to their homes. Previous research on place attachment and disasters has focused on its influence on risk perception, evacuation, relocation, and reestablishment post-disaster (Domingues et al., 2021; Bukvik et al., 2022; Ruiz & Hernández, 2014; Jamali & Nejat, 2016; Knez et al., 2018). The inclusion of place attachment in hazard management has thus far been understudied. This thesis bridges this literature gap by exploring place attachment in the context of crisis management of the Tajogaite eruption, focusing on resident experience and post-disaster recovery. A qualitative methodology was adopted, including 15 interviews and a thematic analysis of the PEVOLCA emergency management plan. The key findings of this thesis are: (i) unclear communication during the emergency and inadequate periods to evacuate meant place attachment was not considered within the management of the volcanic crisis, (ii) place attachment shaped resident experience to a large extent, particularly attachment to La Palma (the island) and the home, and (iii) attachment to place is beginning to be re-established amongst residents within temporary housing, acting as a pull factor for remaining on the island after the eruption. More evidence is required to confidently explore how attachment to place has changed because of the eruption and should be the focus of a future study. This thesis presents recommendations for the development and adoption of 'place-based' hazard management in La Palma and other volcanic islands.

Understanding Recovery Pathways after Extreme Flood Events: Lessons and Experiences from Nigeria and Germany

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Keywords: ***Extreme Flood Events, Recovery Pathways, Sustainable Recovery, Resilience***

Abstract

The recent increase in the frequency of extreme events worldwide highlights the urgent need for comprehensive and coordinated efforts to achieve sustainable recovery and resilience. However, the recovery process following such events has often been prolonged and uneven, and it is frequently overlooked in global disaster management policies. This study aims to address this gap by providing a comprehensive understanding of disaster recovery pathways after extreme flood events, by developing a multidimensional framework.

The research questions guiding this study are: What are the key elements of disaster recovery? What factors act as barriers or facilitators to recovery pathways after disasters? How do these factors contribute to building back better? To answer these questions, the study combines conceptual and empirical insights, including a literature review and an assessment of recovery pathways from recent extreme flood events in Germany and Nigeria.

A multi-methods approach was utilized, encompassing in-depth interviews with representatives from government, NGOs, the private sector, community members, and disaster recovery experts. A total of thirty-eight in-depth interviews were conducted with stakeholders from both countries. Additionally, grey literature and policy documents were analyzed. Qualitative content analysis was employed to analyze the data derived from the in-depth interviews and policy documents.

The findings highlight the significant role of relief organizations in driving recovery efforts, with a particular focus on humanitarian aspects. Moreover, sustainable changes have been observed, such as the implementation of communal heating systems and the use of sustainable materials in building reconstruction. Religious organizations have played a crucial role in providing social and psychological support during the recovery process.

Despite these positive developments, the study underscores a lack of concerted efforts to truly "build back better" during the recovery process, primarily due to political, financial, and institutional constraints. This observation holds across different cases, including the Ahr and Erft regions in Germany and Lagos in Nigeria. These themes have been explored within the broader scope of the Sendai Framework for Disaster Risk Reduction 2015 - 2030.

UKADR ABS-2023-026

A Study of the Well-Being and Resilience of UK Disaster Victim Identification (DVI) Volunteers

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Abstract

Disaster Victim Identification (DVI) represents a specialised investigative role vital after Mass Fatality Incidents (MFI). For example, in the aftermath of earthquakes, tsunamis, and large terrorist attacks. This study presents the findings of a study focusing on the common negative effects of DVI work on the emotional and psychological well-being of a sample of UK-based individuals who volunteer (or have in the past) to work in Disaster Victim Identification (DVI) and how they deal and cope with these negative effects. An exploratory grounded theory approach was adopted, with a sample of 25 semi-structured interviews conducted with both current and retired UK DVI volunteers. Thematic analysis identified 16 key themes, most notably motivations for doing the job, personal rewards, challenges associated with deployment, self-awareness concerning psychological and emotional well-being, coping strategies, support networks, and the levels and appropriateness of available organisational support. The findings also highlight a notable lack of public awareness of DVI volunteers, the work and processes involved, and the common challenges and stresses that confront those who volunteer. Drawing on Bronfenbrenner's socio-ecological model, a DVI well-being model is proposed, which identifies both DVI volunteer well-being protection and risk factors. We end with a brief discussion of the practical implications of the findings and the significance of the well-being of DVI volunteers and offer some tentative suggestions for future research and practice in this area.

Theme 5:

Interconnected Risks and Impacts – Multi-Hazard Risk and Community Involvement

Multi-Risk Factors Behind the 2023 Kahramanmaraş (Türkiye) Earthquake Disaster

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Abstract

In the early hours of 6 February 2023, a magnitude 7.8 earthquake struck south-eastern Türkiye. Nine hours later, a magnitude 7.6 earthquake also rocked the region. The relatively shallow depth of the earthquakes, at about 10 km, resulted in severe shaking over a large area of Türkiye and Syria. As of 1 April 2023, the total death toll of over 57,000 (50,000 in Türkiye and 7,000 in Syria) makes this event the deadliest in modern Turkish history. In this presentation we discuss the state of knowledge of the seismic hazard and the social preconditioning factors that contributed to the tragic events in Türkiye and Syria. We show that the seismic hazard along the East Anatolian Fault, which hosted the earthquakes was well known, yet the devastating impacts indicate that the risks were not adequately considered. The earthquakes occurred during a winter storm with outdoor temperatures as low as -19 °C. They also triggered major aftershocks, several thousand landslides, dam bursts in Syria and flooding. We discuss how the multi-hazard context of the earthquakes exacerbated the impact in the hours to weeks after the main earthquakes. Additionally, we suggest that acute vulnerabilities arising from exposure, corruption and poverty led to a lack of seismic preparedness. We expand on the social factors and discuss how each contributed to amplifying the earthquake risk into the tragic disaster. We end by making recommendations on the ways forward to mitigate seismic risk through better integration of multi-hazard and multi-risk thinking, and management of social vulnerabilities.

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Conceptualising Multi-Hazard Risk: Exploring the Influence of Expertise on Natural Hazard Risk Perception in Squamish, Canada

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Keywords: ***Multi-Hazard Risk, Risk Perception, Expertise, Social Vulnerability***

Abstract

As climate change influences the frequency and magnitude of some natural hazard types there has been a growing interest in understanding multi-hazard risks. Presently, policies are often designed for single-hazard scenarios and are based on the advice, recommendations, and input of natural hazard experts. Experts across all fields are often considered to be qualified persons who have advanced credentials to indicate they have obtained specialised skills and knowledge. Given that the DRR community is pushing for increased research on multi-hazard risk and for the inclusion of stakeholders with varying levels of expertise into emergency management conversations, there is a need to consider how natural hazard expertise influences people's perception of natural hazard risks in multi-hazard environments.

The research applies a mixed methods approach including a survey (n=159) and semi-structured interviews (n=27) conducted in Squamish, British Columbia on the west coast of Canada. The community is susceptible to a wide array of natural hazards including debris flows, coastal flooding, river flooding, earthquakes, landslides, tsunamis, volcanic activity, and wildfire. The survey was designed to explore how natural hazard experts and non-experts who live in and interact with Squamish perceive natural hazard risks and how they prepare for potential events. This process found that there is an insignificant difference between the risk perception of natural hazard experts and non-experts; there is an insignificant difference between the level of disaster preparedness between natural hazard experts and non-experts; residents have significantly different levels of concern to most natural hazard types than non-residents; and experience of previous natural hazard events is the most significant factor in influencing risk perceptions and preparedness actions. These findings could be used to defend the inclusion of local knowledge and hazard experience in disaster risk management and to broaden the definition of expertise in the context of multi-hazard risk.

ID UKADR ABS-2023-004

Engaging Grassroots Public Health Workers and First Responders on Multi Hazard Situations and Complex Emergencies through Scenario-Based Learning

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Abstract

Grassroots level public health workers and first responders have been at the forefront of disaster response among most vulnerable communities in Sri Lanka. Although they have managed to deliver amidst most challenging circumstances, their skill set remain relatively unchanged due to gaps in on-the-job training. Further, to face modern day complex emergencies and cascading effects, trainings need to be modified and contextualized in a timely manner. Hence, National Dengue Control Unit (NDCU), World Food Programme (WFP) and Global Disaster Resilience Centre, University of Huddersfield conceptualized a scenario-based training on multi-hazard situations and complex emergencies with the objective of enhancing their skills and knowledge, through innovative learning. A training blueprint was developed to capture core competencies in disaster preparedness and response, contingency planning and risk communication and validated through a consultative workshop attended by disaster risk management and public health professionals. Thereafter, a training module was developed, incorporating regional diversities, and contextualized to address real life scenarios encountered at the grassroots level. Training module was piloted at a disaster-prone district to refine the scenarios. Scenarios included infectious disease outbreaks, malnutrition, civil unrest, flooding, landslides, cyclones, and elephant-human conflicts in a multi hazard context. Over 400 public health workers and first responders in eight vulnerable districts were trained. Scenarios with relevant injections kept the trainees engaged throughout the training, followed by an evaluation and a discussion moderated by subject specialists. Feedback from the Trainings was used to develop a Training of Trainer (ToT) manual to achieve maximum reach. Innovative learning through scenario-based trainings would serve as a valuable tool for strengthening grassroots public health workers and first responders on challenging complex disaster situations.

Multi-Hazard Interrelationships and Dynamic Risk Scenarios in Urban Areas: Nairobi, Istanbul and Kathmandu

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Keywords: ***Anthropogenic Processes, Dynamic Risk Scenarios, Global South, Multi-Hazards***

Abstract

Urban areas are rarely exposed to just a single natural hazard type. Hazards often interrelate and interact (e.g., volcanic eruptions triggering landslides) across a diverse range of spatial and temporal scales, resulting in multi-hazard events that often yield more severe impacts compared to isolated single-hazard events. Research on these interrelationships, particularly in urban centres of low- and middle-income countries, is sparse. Here we explore this research gap by systematically investigating multi-hazard dynamics for 24 different hazard types (e.g., flood, fire, fog) in three diverse and data-limited cities: Istanbul (5461 km^2), Kathmandhu (49 km^2) and Nairobi (696 km^2) with 15.5, 1.6 and 5.3 million people, respectively. For each city, we systematically search for and collate evidence from over 200 sources, including academic and grey literature, online media, and social media. We identified 23, 21, and 20 different natural hazard types for Istanbul, Kathmandu, and Nairobi respectively, out of a possible 24, showing the breadth of hazards that might impact each region. Additionally, potential multi-hazard interrelationships were explored, uncovering 106, 83, and 88 respective interrelationships out of 576 possibilities. This evidence is used to produce dynamic risk scenario exemplars for each urban area. These exemplars are refined, including adding new ones, through collaborating with local hazard stakeholders in five 2-3 hour facilitated workshops (Istanbul, Nairobi, Kathmandhu: 2, 2, 1 workshops and 21, 26, 7 stakeholders, respectively) and nine semi-structured interviews. The dynamic risk scenarios consider both short-term events (e.g., days or weeks) such as earthquakes triggering landslides and blocking rivers, and longer-term (e.g., years, decades) such as climate change or urban growth influencing risk dynamics. Stakeholders identified several challenges to implementing multi-hazard considerations into policy and practice but also recognised potential for increased dynamic risk awareness and its incorporation into preparedness and urban project planning, thus benefitting disaster risk management.

Harnessing the State-of-the-Art in Building Resilience: Toward a Cohesive Community Resilience Strategy in the CORE Project

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Abstract

Traditional hazard risk analysis methods have bolstered single-hazard resilience, yet complex events often trigger systemic risks, extending beyond established resilience measures and creating fresh policy challenges in disaster risk management. Recent studies and the Midterm Review of the Sendai Framework for Disaster Risk Reduction (MTR SF) from 2015–2030 reveal significant gaps and uncertainties in various aspects of resilience strategies, especially in the recognition of systemic risk perspectives. This underscores the necessity for an all-encompassing approach to building resilience, focusing on vulnerable communities, and gaining a thorough understanding of the cohesion among state-of-the-art practices from previous complex incidents. This is an account of a study to explore the state-of-the-art practices related to these complex characteristics, which will ultimately contribute to the development of a harmonised resilience strategy that can enhance crisis management capabilities in European cities. An international team of researchers studied the state-of-the-art risk management measures through a comprehensive analysis of seven disaster incidents in Europe and Asia, seeking insights that illustrate the practical applications and challenges of these risk management measures. The disaster incidents include tsunamis, earthquakes, terrorist attacks, flash floods, industrial accidents, wildfire, and COVID-19 covering a variety of aspects in building resilience. A questionnaire was deployed to identify the key resilience practices in each incident. By comparatively analysing the state-of-the-art building resilience practices, ten guiding principles were extracted. These principles are centred on recognising the drivers of systemic risk, attributing driver-specific strengths for systemic risk mitigation, and securing the long-term resilience of systems upon which human survival hinges. These guiding principles highlight the imperative understanding of integrated risk concepts, including risk diagnosis criteria, cascading effects, and science-based management and governance strategies essential for dealing with systemic risks in the context of evolving realities, such as the COVID-19 pandemic. These principles collectively provide a comprehensive framework for enhancing community resilience in the face of multifaceted hazards and challenges.

Triple Crisis; Climate Change, Systemic Vulnerability & Economic Downturns Withering the Corners of Food Security: Case Study from Sri Lanka

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Abstract

Food insecurity has never been felt and debated as today in Sri Lanka. The economic crisis, the COVID-19 pandemic, and past government policy decisions are being debated as reasons to blame. Climate change and associated extreme hydrometeorological events, economic downturns and access to resources pay a high price on the already stretched sectors such as food security. Food security is seen as a core human right in most countries. 'Zero Hunger' is the second priority of the Sustainable Development Goals (SDGs). Its goal is to "eliminate hunger, provide food security, improve nutrition, and advance sustainable agriculture." It is directly related to the first SDG, 'No Poverty,' but Sri Lanka is struggling like never before with rising poverty, inflation, loss of livelihoods and economic shocks contributing to widespread food insecurity at an alarming rate. Therefore, this research aims to identify the nexus between climate change and food insecurity using Sri Lanka as a case study. Semi-structured interviews with policymakers, technical experts, and practitioners in the fields of food security, climate change, disaster risk reduction, and socioeconomic development planning were conducted using the case study research strategy. Thematic Analysis and Cognitive Mapping were used to examine the data and evidence collected, using Nvivo-20, Computer-Aided Qualitative Data Analysis Software. The findings suggest that current food insecurity in Sri Lanka is due to a triple crisis resulting from climate emergency, economic downturn, and systemic vulnerabilities associated with institutional, policy, planning, and practice gaps. Worse is yet to come if the triple crisis is not addressed holistically through an integrated planning approach to sustainable development.

UKADR ABS-2023-120

Theme 6:

Vulnerability and Inequality – Societal Resilience and Vulnerability

Spatial Distribution of Non-Communicable Diseases and Implications for Community Vulnerability: A Case Study in Sri Lanka

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Abstract

Health and well-being of individuals and communities play critical role of health in building resilient communities and are essential foundations for sustainable development. It tries to create communities that are not only economically and environmentally sustainable but also socially resilient, with the health and well-being of their inhabitants at the forefront of their priorities. However, the impact of COVID-19 pandemic has shifted global attention towards communicable diseases, inadvertently neglecting the significant impact of Non-Communicable Diseases (NCDs). NCDs contribute to a substantial number of annual deaths, accounting for approximately 71% (41 million) of all deaths worldwide. More than 83% of the deaths reported in Sri Lanka have occurred due to NCDs at present. Acknowledging health as a critical factor that amplifies community vulnerability, the Sendai Framework for Disaster Risk Reduction (SFDRR) emphasises the necessity of understanding vulnerable groups based on their health conditions. This study aims to identify the spatial distribution of NCDs, specifically focusing on cardiovascular diseases, cancers, and diabetes, and to exploring the potential association with environmental factors. Secondary data from the Registrar General's Department (2010-2015) is utilised and thematic visualisation and analysis using ArcGIS facilitate the mapping of NCDs across Sri Lanka's districts. Through the calculation of cause-specific death rates and prevalence rates, this study identifies the districts with the highest vulnerability for each disease category. The results indicate that Colombo and Kandy districts are prominent and common for all three diseases. The results highlight a higher mortality rate among men compared to women. The outcomes of this study will support the decision makers for making communities resilient by identifying high-risk areas, tailoring targeted interventions, and promoting healthier environments where individuals can thrive. Furthermore, the study aims to explore the association between environmental factors and NCD-related deaths at the district level while providing insights into the broader distribution of deaths in future. Findings from this study will contribute to the understanding of community vulnerability based on NCDs, enabling decision-makers to enhance disaster preparedness and build resilient communities.

Child-Centred Disaster Risk Reduction: Children's Narratives of Lived Experiences through Arts-Based Methods in Nairobi, Kenya

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Abstract

Children's exposure and vulnerability to local hazards, influenced by socio-economic factors, is often overlooked due to 'adultcentrism' in DRR, impacting their health and wellbeing. An inclusive 'whole of society' approach, valuing children's perspectives, leads to risk-informed decisions and enhances resilience. Despite the United Nations Convention on the Rights of a Child (UNCRC 1989) advocating their right to be heard, children's voices are rarely reflected in policy. This research explores the effectiveness of a child-centred approach in understanding the risk environment and improving health and wellbeing of children in a Nairobi informal settlement.

The hazards and risks in this context are understood through participatory methods with 36 children aged 10-14. Hazards such as open sewage, poor sanitation, and inadequate infrastructure in their schools and neighbourhoods are frequently withstood. To comprehend these risks, child-centred arts-based activities were conducted, enabling the children to express their lived experiences through creativity, propose solutions, and identify their support networks for risk communication. The children engaged in various activities such as drawing, deep mapping, body mapping, walking interviews, modelling, and storytelling, which facilitated engagement, balanced power dynamics, and fostered ownership.

Initial results from this research emphasise the considerable hazards and risks affecting children's health and wellbeing in their schools and neighbourhoods. The effectiveness of child-led methods is confirmed through the output of detailed, authentic narratives expressed through storytelling and art. These narratives have led to insightful themes, encapsulating ideas like 'children are experts in their own lives' and 'dynamics of adult-child relationships'. Further examination of the collected data on risk narratives and communication networks is planned. It is expected that these analyses will reveal a unique perspective of children's risk perception, differing from prevailing views, and highlight the complexity of existing communication pathways for children's voices to be heard and taken seriously for disaster risk reduction.

Systemic Societal Vulnerability: An Assessment of Place-Based Intersection of Coastal Flood in Eti-Osa, Lagos, Nigeria

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Abstract

Coastal communities are often faced with the prevalence of flood hazards, with low-lying areas being particularly vulnerable. These coastal communities are subjected to disproportionate losses which may vary depending on individual circumstances. These disparities are pronounced in developing countries where informal settlements coexist amidst affluent neighbourhoods. This paper presents the outcome of survey and key informant interviews conducted in 2023 in Eti-Osa (Nigeria) to evaluate the vulnerability of communities exposed to coastal flooding. Themes were coined from the results of 869 household surveys conducted through purposive sampling and 7 key informant interviews involving community stakeholders. The findings from this study reveal that households in informal settlements reside in dwelling units made from bamboo, corrugated metal sheets, plywood and tarpaulin often sited along the shoreline and river tributaries. Additionally, a significant majority of them do not have any form of insurance coverage. The absence of insurance increases the vulnerability of households to financial losses in the event of flooding as they lack a safety net to recover from incurred damages. Also, wealthy neighbourhoods had unobstructed drainage channels for conveying floodwater while slum communities' drainage channels were blocked with solid waste. The paper concludes that shared geographical proximity does not justify similarities in vulnerability, as neighbourhoods like the Lekki, Ajah Okun Alfa, Okun Mopo and Lafiaji have shown significant differences in their vulnerability to flooding despite being situated in Eti-Osa. The finding of this study serves as a foundation for an in-depth investigation of the disparity of flood impact on coastal communities in Eti-Osa.

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Storm Alex 2020 : Responsibility, Solidarity and Mutual Aid for Community Resilience

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Abstract

The aftermath of Storm Alex in Southeastern France highlighted new avenues for human interaction during disasters. Unfortunately, authorities and rescue personnel often perceive populations as passive actors, overlooking their potential as valuable human resources. This perspective fails to recognise their active role. It's crucial to study how local communities behaved and established solidarity alongside official institutions' activities. Upon analyzing accounts from local *residents, authorities and rescue personnel*, we have identified unique social and organisational aspects. *Robust social networks and bonds* among stakeholders illustrate the presence of a Westernised *adaptation of ancestral collective practices*. Comparable *ancestral collective behaviours* exist worldwide, such as The Minga in Andean countries, Moyai-Naoshi in Japan, or Twiza in certain Arab nations. These cultural practices serve as collective mechanisms for addressing both collective and individual challenges in the wake of disasters. They represent *ancestral collective units and practices* with diverse functionalities that transcend boundaries. In the case of Storm Alex, these *communal survival units and practices* were automatically activated during and following a 48 hour complete *blackout*. We observe its emergence in the *qualitative analysis* of *ninety eight interviews*. For operational purposes in the French context, we refer to it as *"MINGAS"* which stands for *"Mouvement d'intervention immédiate, générosité et actions solidaires"* or *"Immediate intervention movement for generosity and solidarity actions"*. Notably, we have observed that this movement remains active in the long term after the disaster. The key to the success of this unit lies in the *culture of sharing* embraced by the valleys' inhabitants. Continuous *mutual aid and acts of solidarity* have empowered local residents and serve as an example of *social resilience*. After the event people have shown a heightened *sense of responsibility*. However a work with state institutions is necessary for a better coordination but it remains unfinished.

How Can the Concept of 'Syncretism' Help Responders Think about Interoperability in Disaster Response?

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Keywords: ***Syncretism, Fukushima, Contamination, Interoperability***

Abstract

The central argument this paper poses is that the concept of 'syncretism' can be a useful tool for reimagining interoperability in disaster response and recovery. Interoperability in disaster management [*the ability of systems to work together in order to communicate and exchange information when necessary*] can often be thought of as primarily driven by technical and data requirements that help or hinder data and knowledge sharing between responders. My research shows that the social science concept of *syncretism* can illuminate some of the human dimensions of effectively working together and sharing information, knowledge and understanding. *Syncretism* offers new avenues for thinking about what is happening when emergency responders operate together in response to multi-agency emergency. Originally a way of thinking about how different religious traditions operate in shared spaces, *syncretism* concerns what happens when two originally discrete traditions operate in the same space at the same time. Social scientists (Law et al, 2013) have offered at least six ways (modes) in which this might play out; denial, domestication, conflict, collapse, care and separation. These modes all follow different logics dependent on whether the two practicing groups intended their practices to appear coherent. I show, using data gathered from ethnographic fieldwork undertaken in Fukushima, Japan following the 2011 nuclear disaster, that individuals and organisations negotiated various modes of syncretism at different times as a means to maintain or contest the appearance of coherence between their practices and those of others. This highlighted structural, political and power imbalances between actors and their agency to act in different places and spaces. These findings are of value to emergency responders and publics who work together in response to emergencies but who nonetheless struggle to share information and work together effectively.

Geriatric Care beyond Clinical to Multidimensional Healthcare in Context of Climate-Induced Floods and Typhoons: A Cross-Country Systematic Review of Older Chinese and Filipinos

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Abstract

Background: Apart from the two Asian countries —China and the Philippines continue to rapidly witness the ageing populations of over 60 years, they are also reported to be exposed to and affected by different climate-induced hazards, in particular, floods and typhoons. Thus, a cross-country systematic review was conducted to synthesize the existing evidence about the disabling conditions and geriatric care for older Chinese and Filipinos affected by floods and typhoons, respectively.

Methods: Four electronic databases were systematically searched to identify eligible studies published between 2000 and early 2023. This had to confirm to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA), as well as the standard protocol registered with PROSPERO (CRD42023420549).

Results: Out of 317 and 216 initial records for China and the Philippines, respectively, retrieved, 27 (China) and 25 (Philippines) studies were eligible for final review. The disabling conditions they reported to affect the health of older adults were grouped into cognitive and intellectual disabilities, physical, chronic, and terminal illnesses, and mental and psychosocial, with the latter identified to be the most prevalent to affect older Chinese and Filipinos. Posttraumatic stress disorder (PTSD) was the most common condition identified to affect older Chinese, while injuries and wounds prevailed among older Filipinos.

Conclusion: The increasingly occurring extreme climate hazards, in particular floods and typhoons in China and the Philippines, respectively, imposed various disabling impacts or conditions on the health of their older persons, whose numbers have been rapidly spiralling in the recent past. Therefore, interventions prompted to respond to geriatric care in the context of climate change and ageing societies beyond China and the Philippines to other flood- and typhoon-prone settings ought to be multidimensional to consider the healthcare of older adults beyond clinical to mental and psychosocial, spiritual, community and home-based, occupational and physical interventions, etc.

UKADR ABS-2023-108

Theme 7:

Interconnected Risks and Impacts – Systemic Risk and Resilience

A Systematic Framework for Multi-Scale Flood Prediction and Resilient Planning Using Remote Sensing and GIS Systems

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Abstract

Floods, exacerbated by climate change and urbanization, necessitate advanced methodologies for prediction and resilient planning. This research introduces a systematic framework integrating Remote Sensing (RS) and Geographic Information Systems (GIS) to address multi-scale flood challenges. The core of the research lies in developing an inclusive approach that not only harnesses cutting-edge technologies but also considers socio-economic factors and community resilience. The proposed framework encompasses a holistic approach, bridging the gap between data acquisition, modelling, and decision-making processes. By acquiring high-resolution, multi-dimensional data through RS technologies, the research establishes a robust foundation for subsequent analyses. GIS is then employed for spatial modelling, simulating critical elements such as river flow and floodplain inundation. Additionally, GIS plays a pivotal role in guiding resilient planning, integrating socio-economic data to identify vulnerable areas and populations, informing adaptive land-use planning and infrastructure development. The research systematically addresses gaps in existing literature, including the integration of social factors, uncertainty mitigation, and scalability challenges. It employs both quantitative and qualitative methods to comprehensively collect data and derive meaningful insights. Qualitative methods, including Interviews and questionnaire surveys, were utilized to identify and understand the multifaceted impacts of flooding. In the realm of RS, the study applied advanced techniques such as the Normalized Difference Water Index (NDWI) and Enhanced Vegetation Index (EVI). Additionally, hydrological modelling, employing tools like the Soil and Water Assessment Tool (SWAT), Flood Inundation Mapping, and GIS-based Floodplain Mapping, will conducted. This integrated methodology facilitated a thorough Flood Hazard Mapping and Vulnerability Assessment for the City of Colombo, Sri Lanka. Colombo as the primary focus of this research is well-justified due to its status as a densely populated urban centre with a history of recurrent flooding events. The city's unique combination of geographic, climatic, and demographic factors and its economically significance as the commercial capital of Sri Lanka further accentuates the potential impacts of flooding on critical infrastructure and livelihoods, providing a holistic context for the application and validation of the systematic framework for multi-scale flood prediction and resilient planning using RS & GIS. The insights gained from this case study are expected to have broader applicability to similar urban areas worldwide, enhancing the research's overall significance and relevance. In conclusion, the research aspires to contribute a forward-thinking framework, not only advancing flood prediction precision but also fostering resilient planning strategies that account for the diverse factors influencing community vulnerability.

UKADR ABS-2023-025

The Utility of Applying Geographical Imaginaries Theory; A Case Study from Lonquimay Volcano, Chile

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Keywords: ***Disaster Memory, Geographical Imaginaries, Social Volcanology, Vulnerability***

Abstract

This talk will discuss the utility of using and applying the theory of 'geographical imaginaries' as an orientating concept from the disciplinary perspective of geographical disaster research. This involves looking beyond narrow conceptualizations of risk and instead examining the interconnections between local culture, politics, and the environment, with implications for designing effective disaster risk reduction. The talk will detail a case study of Lonquimay volcano in Chile.

Social science data collected from semi-structured interviews with people living near the volcano demonstrate a diversity of beliefs and knowledges about Lonquimay, particularly contrasting between two settlements, but also shared imaginaries and relationships with the volcano that are integrated within other elements of daily life and livelihoods. These results demonstrate a complex set of perspectives and memories of the previous eruption will likely influence responses to future volcanic activity, including expectations of hazards that may shape reactions to early warnings, and the likelihood of evacuation. Therefore, this case-study shows the importance of investigating geographical imaginaries and their constituent memories and knowledges as a way to better understand how people know risk and disasters.

Seismic Risk and Resilience Assessment Framework for Uganda: towards Improving the National Policy for Disaster Preparedness and Management

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Abstract

Uganda is situated between the eastern and western branches of the East African Rift System. Over the past decades, many catastrophic earthquakes have had detrimental consequences on the socio-economic welfare and resilience of communities across Uganda. Moreover, the disastrous impacts of earthquakes have been exacerbated by coseismic landslides. With increasing population, urbanisation and rapid construction, seismic risk is escalating fast and is compounded by high vulnerability of buildings and inadequate disaster prevention and mitigation strategies. Hence, there is urgent need to assess Uganda's resilience against seismic risks. As a precursor towards building an earthquake risk and resilience framework, this work employs the probabilistic event- based risk calculator embedded in OpenQuake-engine to holistically assess potential losses resulting from future earthquakes. Using a fault-oriented spatially distributed seismicity approach, a logic tree is implemented to minimise the associated epistemic uncertainties and site conditions are modelled using the upper 30m average shear wave velocity across Uganda. The findings confirm that western Uganda is exposed to the highest level of seismicity where for instance Rwenzori and Kigezi regions can expect bedrock peak ground accelerations increasing to 0.27 g over a 475-year return period. Further estimates indicate mean economic losses in excess of US\$ 188.290 million, US\$ 985.987 million and US\$ 1.627 billion (correspondingly accounting for 0.46 %, 2.39 % and 3.94 % of Uganda's nominal gross domestic product) over a 10- year, 50-year and 100-year return periods respectively. By and large, the earthquake risk model predicts an overall average annual economic loss of US\$ 81.7 million across the whole country. The findings herein will not only be a big step towards the urgent need to update the Uganda seismic code, but also strategically contribute to land use planning patterns, optimisation of earthquake insurance pricing and improvement of the National Policy for Disaster Preparedness and Management.

Open Data Driven Assessment of Flooding Impacts on Transport Networks in Smart Urban Environments

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Abstract

Flooding is one of the most catastrophic natural hazards, claiming millions of lives and causing financial and environmental damage worldwide. Geospatial hazard maps can help indicate potential at-risk areas and assist emergency services in preparing for and responding to flooding incidents. However, these hazard maps often indicate the probability of flooding for a given probability scenario based on the fixed model parameters selected. As flooding can evolve dynamically, different stakeholder groups (e.g., blue light services, city councils, and transport managers) require real-time location-based data on weather, traffic, and hazard conditions.

The data needed to perform a holistic assessment of the current flooding situation and support strategic decision-making often reside with various agencies and data platforms. Following the systems engineering design, this study aims to answer the question: How can we use data from internet-enabled devices in smart urban environments to provide multi-agencies with a geospatial-supported flood impact assessment for a more resilient city?

This study aims to build on existing work (Wolf et al. 2023) and develop a geospatial-based prototype that supports two main areas: (1) Integrating dynamic environmental and transport data from the Environment Agency, Newcastle Urban Observatory, DfT and the Tyne & Wear Urban Traffic Management and Control Centre; and (2) enabling spatio-temporal analysis of flooding impacts on transport networks.

We use Esri-based geospatial technology and Microsoft Azure cloud computing services for data extraction, transformation, and analysis. The final research output in a geospatial dashboard solution integrates and visualises data from heterogeneous data sources in a common operating picture and provides support for multi-agency response and impact assessment.

This study demonstrates the value of openly available data that can support multi-agency collaboration and the broader JESIP framework. Lessons learned can inform emergency services in future decisions on deploying resources and managing the transport network during similar events.

Community-Based Approach on Pandemic Preparedness as a Versatile Method for Mitigating Disaster Risks among Vulnerable Communities: The Case of the COVID-19 Pandemic

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Key words: ***COVID-19 Pandemic, Pandemic Preparedness and Response, Vulnerable Communities, Community-Based Approach***

Abstract

The significance of community Involvement in planning and implementing disaster preparedness and response activities in the local context has also been highlighted during the COVID-19 pandemic, like within the context of other hazards. The key discourse on pandemic preparedness planning is building resilience among vulnerable communities and strengthening local preparedness capacities to mitigate cascading impacts in local community settings. Within this context, this paper aims to highlight the potential of the community-based approaches to pandemic preparedness and response, focusing on the COVID-19 pandemic. Data pertaining to this study was collected using a desk study, and data analysis was done using thematic analysis. Results revealed that socially vulnerable groups such as poor, culturally marginalised communities, people with physical and psychological disabilities, elders, homeless and under-shelters, slum dwellers, and those remote from physical infrastructures have suffered from multiple challenges in the COVID-19 outbreak. Also, many mental health issues during the COVID-19 outbreak have also been identified as having cascading impacts of largely either due to weaker social support or financial constraints due to loss of income. Further, critical issues in the grassroots, such as stigmatisation of 'covid positive' known as 'corona phobia', challenging mental health disorders among frontline healthcare workers, and issues of marginalised groups such as migrants, slum dwellers, and homeless were found to be overlooked. Preparedness for a pandemic or epidemic is known as the readiness point, which executes imposing preventive strategies combined with medical countermeasures such as vaccine/ prophylaxis and non-medical countermeasures including social and physical distancing, self-isolation, travel bans (mobility restrictions), disinfection measures and quarantine that need optimal participation of communities in the local setting. The Community based approach in turn is a potential strategy to address many of grassroots level challenges appeared among vulnerable communities during complex hazards.

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Optimising Evacuation Strategies for Rapid Onset Hazards amidst Pandemics: A Comparative Study of Nature-Inspired Approaches

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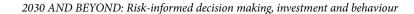
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Abstract

The limited lead time available for rapid onset hazards such as earthquakes and tsunamis, combined with the complexities of pandemic outbreaks (COVID-19), contribute to the rise of systemic risks and necessitate measures for multi-hazard preparedness and response. In responding to such complexities, ensuring social distancing, determining dynamic evacuation routes, identifying suitable relief centres and capacities, and establishing effective response and recovery procedures present significant challenges. This research aims to evaluate the applicability of nature-inspired algorithms in optimising evacuation strategies for rapid-onset hazards amidst pandemics, taking the tsunami risk in Sri Lankan coastal cities as the unit of analysis. Weighted centrality-based disaster scenarios were created to evaluate various evacuation contexts in the presence of rapid-onset hazards and disease transmission. The weighing parameters were identified through a systematic literature review and expert interviews, and the key issues were identified through scenario evaluations and categorized based on centrality values. The Ant Colony Optimization (ACO) algorithm, Particle Swarm Optimization (PSO), and Artificial Bee Colony Optimization (ABC) methods were employed to address the identified key issues and optimise evacuation and response. The ACO algorithm, drawing inspiration from the ant foraging behaviour, considers multiple objectives such as minimizing evacuation time, reducing congestion, and dynamic routes. The PSO algorithm, inspired by the collective behaviour of birds or fish, optimises evacuation routes considering the evacuation phase and social distancing requirements into account. Simulating the behaviour of bees in exploring food sources, the ABC algorithm identifies suitable relief centre locations that minimise overcrowding while ensuring adequate access. By considering multiple objectives, incorporating real-time data, and adapting to changing conditions, it was established that these algorithms effectively address challenges related to social distancing, dynamic route determination, and relief centre location. The outcome of this research can be used to optimise resource allocation, minimise congestion, ensure safe distance, and enhance the overall communication and resilience of evacuation strategies.

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Theme 8:

Resilient Infrastructure and Built Environment

Resilience and Recovery Assessment of Integrated Systems

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Keywords: ***Agent-Based Modelling, Bayesian Networks, Education Resilience, Integrated Systems***

Abstract

Performance of critical systems such as education is often integrated with other infrastructure systems, such as transportation, which influence the disaster resilience and recovery of communities under natural hazards. Hence, it is necessary to understand and capture the interaction between the integrated systems in order to assess their resilience and recovery. This paper proposes an approach that combines Bayesian networks and Agent-based modeling to analyze system performance and recovery, respectively, of integrated school-road systems, with an illustration of its application in the Dominican Republic. The modelling framework first estimates the vulnerabilities in the education and transportation systems to natural hazards such as earthquakes and floods, which assists in prioritizing resource allocation and interventions. Secondly, it estimates the recovery trajectory of these two systems and the dispersion of total time of disruption in the educational service. The output can inform policy making by quantitatively testing the efficiency of alternative mitigation measures. The paper presents a cost-benefit analysis to highlight the influence and cost of selected mitigation measures in reducing the days of disruption. It can be concluded that the proposed retrofitting measures for the vulnerable schools and elements of the transportation system in the Dominican Republic case study significantly reduces the total disruption.

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Impact of Smart City Tools and Technologies towards Achieving Disaster Resilience

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Abstract

Driven by a combination of factors including rapid urbanisation and consequent urban challenges, resource scarcity, technology advancements and their potential benefits, the interest in smart cities globally has been steadily growing. In response to the increasing recognition of the need to prepare urban areas for future disasters, Smart Cities leverage technology and data in comprehensive resilience planning. However, to balance multiple considerations including financial and social factors in terms of available resources, each Smart City need to decide on the most appropriate tools and technologies with careful consideration. In making that decision on tools and technologies for disaster resilience within Smart Cities, there needs to be a good understanding of what the available tools are, and there also need to be mechanisms to evaluate the impact of Smart Cities' tools and technologies. To address this need, this study aims at identifying the factors that determine the impact of the Smart City tools and technologies towards achieving disaster resilience. In achieving that aim, initially, a comprehensive literature review was conducted. The literature findings were later developed following 21 expert interviews conducted with Smart City and disaster resilience experts. Linking innovation with theory, four factors have been identified : (1) the impact on society (social system and technical system), (2) the adoption speed by Smart Cities (acceptance from the users and diffusion), (3) the maturity of the technology, and (4) the capabilities offered to the community. The interview findings advised on expanding the first factor to different actors in society; particularly within the disaster resilience discipline. The above factors also need to incorporate cost-effectiveness, inclusivity, effective integrations, and interoperability. Together with feasibility studies, this study supports the view that a Smart City that plans the technologies/ tools to build/enhance/sustain its disaster resilience can carry out assessments for all the above factors to make informed decisions and ultimately prioritise the most suitable for them.

Improving Resilience for Road Networks in Nepal

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Abstract

Road cut slope failures are extensive throughout Nepal's road network, resulting in significant social, economic, and environmental losses. Road-cut slopes are formed through excavation to construct and widen roads. They must be carefully designed and excavated to provide more resilient road networks. Failure of road-cut slopes in Nepal can be partly attributed to unreliable road-cut design guidelines. We aim to co-develop a new comprehensive set of road cut slope design guidelines for Nepal to contribute to the improvement of resilient road networks in Nepal. The guidelines will be collaboratively developed with stakeholders, including governing officials, government road engineers and consultants. Key steps of our methodology to develop the new guidelines include (1) qualitative data collection with stakeholders to ensure guidelines are developed according to the needs of the engineers; (2) desk-based study and fieldwork to evaluate the conditions of typical cut slope scenarios; (3) numerical analyses to assess the stability of the cut slope scenarios and extrapolate their conditions; (4) development of user-friendly guidelines using data from the field and numerical analyses; and (5) training of road engineers on the use of new guidelines. The key outcomes of this research will include the development of a comprehensive set of road cut slope design guidelines tailored to the needs of Nepali road engineers and for Nepali road engineers to be trained in the use of these guidelines. The integration of these new guidelines into policy will enhance the resilience of Nepal's road network.

UKADR ABS-2023-091

Investigation of the Impact of Flooding on Road Accessibility and Mobility in the Colombo Region

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Abstract

Understanding the cascading effect of flooding on road transportation is essential for effective disaster preparedness, recovery, and response, as road transportation maintains accessibility and mobility. Although successful studies have been conducted to identify the direct impact of flooding, limited studies have been conducted to study the cascading effects of flooding, such as accessibility and mobility effects. Therefore, the objective of this study is to analyse the impacts on accessibility and mobility changes caused by floods in Colombo District, Sri Lanka. Colombo District was used as the case study for this study, considering its vulnerability to flooding and rapid urbanisation trends. Under the study methodology, first, the study identified the cascading effects of flooding and determined the different types of accessibility and mobility cascading effects. The flooding inundation areas were identified using the Google Earth Engine and Sentinel-1 SAR data in October 2022 in the Colombo District. Road accessibility was measured using the Spatial Design Network Analysis (SDNA) tool. Finally, to identify the mobility changes during the flooding events, the Google Community Mobility data was used and analysed for the mobility changes in retail, grocery, transit, residential, and work. The key findings of the study illustrate that, overall, 11% of the road network was affected by flooding in the Colombo District, while 4% of highly accessible roads were affected. On the other hand, the mobility of retail, workplace, grocery, and transportation has reduced while the mobility of residential and parks has increased after the flooding incident. With the findings of this study, urban planners, transport planners, or responsible authorities in disaster management can come up with strategies to minimise the current cascading impact on transportation and to develop a resilient transport network in Colombo, Sri Lanka. Therefore, this study provides a significant contribution to the current knowledge in the field of resilient infrastructure development in terms of identifying cascading effects of road transportation and minimising the cascading effect of flooding on road transportation in Sri Lanka.

UKADR ABS-2023-105

The Concept of Disaster-Resilient Housing: A Holistic Viewpoint

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Abstract

Housing is indispensable to the well-being and advancement of societies as it is a composite asset linked to livelihoods, health, education, security, and social and family stability and acts as a social centre for family and friends, a source of pride and cultural identity. Housing sector damage is among the most intense and harmful impacts of natural hazards, triggering significant socioeconomic deterioration in the human development agenda. The impact on the housing sector is accountable for the significant share of economic damages made to the national economy after a disastrous event. Accordingly, housing is a highly vulnerable asset, and the destruction or loss of homes through displacement is among the most evident effects of natural hazards. Therefore, making the housing sector disaster-resilient has substantial importance in many aspects. Currently, there are several resilient housing programmes initiated in different countries. However, most of these resilient programs focus on the physical resilience of the housing sector, and the socio-economic perspectives are often overlooked. Furthermore, a solid theoretical basis for the disaster-resilient housing concept is not found in the existing knowledge base.

Accordingly, the study investigates the disaster-resilient housing concept in detail, exploring the existing resilient housing programs and current practices. The study develops a holistic viewpoint of disaster-resilient housing, covering technical, organizational, social, and economic perspectives. Furthermore, the study aims to align the concept of disaster-resilient housing along the Disaster Management Cycle, and the research investigates the role of disaster-resilient housing, preparedness, disaster response, rehabilitation and recovery, and prevention and mitigation. This study is based on a narrative literature synthesis using the narrative literature review method. Further, a qualitative content analysis and thematic analysis are used to summarise the findings. The outcomes of this study can be used as a basis for developing disaster-resilient strategies and pathways for the housing sector.

UKADR ABS-2023-114

The Resilience Genesis: A Framework for Enhanced Post-Disaster Housing by Exploiting BIM, Generative Design and DfMA

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Keywords:	**Building Information Management, Disaster Management, Generative Design, Design for Manufacture and Assembly**

Abstract

During any disaster aftermath, the housing reconstruction arrangement presents multidimensional challenges, impaired by the complicated management of data, stakeholder coordination, and urgent timelines. This research introduces an innovative framework designed to revolutionise disaster management cycles by exploiting Building Information Management (BIM) at its core, thereby, facilitating a bidirectional flow of data relating to the affected populations, urban configurations, and construction methodologies. The proposed framework leverages the synergy between BIM and Off-site Manufacturing (OSM) to optimise the design and construction/manufacturing/assembly of temporary housing, from inception to end-of-life decisions, empowering a sustainable pathway for their alteration into permanent structures or their strategic reuse.

Central to the research proposed framework, is the engagement of affected individuals, whose data becomes a keystone in managing the immediate post-disaster necessities, and actively involving them in the design process of their future homes. This collaborative approach, not only tailors the reconstruction to community needs, but also allows affected individuals by giving them a stake in their urban recovery.

To navigate the impediment of post-disaster urban/architectural design, the proposed framework integrates Generative Design (GD) principles, which handle diverse data inputs in order to produce contextually appropriate housing solutions. Therefore, it addresses the challenge of reusing prefabricated components and engaging community in the design process, thus laying the groundwork for resilience and recovery. This framework not only rationalises the disaster management cycle, but also envisions a future where post-disaster housing is inherently resilient, responsive, and sustainable.

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Risk Governance – Planning and Policy

Standardised Hazard Definitions for More Effective Disaster Risk Reduction: Reviewing the UNDRR/ISC Hazard Information Profiles

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In partnership with the UNDRR/ISC Hazard Information Profiles Phase 2 Steering Group, including the following organisations: CODATA, Food and Agricultural Organization, International Federation of Red Cross and Red Crescent Societies, Insurance Development Forum, International Science Council, World Health Organization, World Meteorological Organization, University of Extremadura, United Nations Economic Commission for Europe, United Nations Office for Disaster Risk Reduction

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Keywords: ***Evidence-Informed Policymaking, Hazard Definitions, International Partnerships***

Abstract

A lack of standardised hazard definitions can have significant impacts. It can hinder efforts to report the event impacts, which can in turn create barriers for generating disaster risk reduction strategies. It can also restrict efforts to develop effective early warning systems and forecast future events. In 2019, the UN Office for Disaster Risk Reduction (UNDRR) and the International Science Council (ISC) established a Technical Working Group to identify the full scope of hazards relevant to the Sendai Framework for Disaster Risk Reduction as a basis for countries and other actors to review and strengthen risk reduction policies and risk management practices. The resulting UNDRR/ISC Hazard Information Profiles were published in 2021 and are now under review. This research will identify potential requirements for profile definition updates in alignment with scientific advances, changes to classification structures and additional scientific evidence to include within the profiles.

The methodology for the review will involve engagement with scientific experts from diverse geographical regions and a range of organisational backgrounds including United Nations agencies, academia, government agencies, intergovernmental organisations and the private sector. They will be asked to systematically review profiles within hazard groups that are relevant to their expertise, review relevant academic literature and gather user feedback through surveys and interviews. Relevant users might include, among many others, national disaster management agencies and national statistical offices.

The review will include consideration of the hazard name, definition, metrics, associated legal instruments, and examples of drivers, outcomes and risk management strategies. Reviews should also explore whether the Hazard Information Profiles are statistically relevant and whether cascading impacts are reflected.

The research will conclude in 2025, with the results intended to inform future efforts to identify and communicate about the hazards that result in disaster impacts, which can in turn support early warning and prevention strategies.

UKADR ABS-2023-047

A Transdisciplinary Approach for Improving Global Preparedness for Large Magnitude Volcanic Eruptions

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Abstract

The eruption of the Hunga Tonga Hunga Ha'api volcano in the South Pacific in early 2022 provided us with a unique opportunity to assess our global preparedness for a potential future large magnitude volcanic eruption. The eruption, despite its short duration (just a few hours), was one of the highest intensity eruptions recorded with modern instruments. It sent a shockwave around the world, triggered tsunamis in two oceans and caused severe disruption and damage to the Kingdom of Tonga. In the immediate aftermath of the eruption, the severing of submarine cables and damage to critical infrastructure left Tonga shut off from the outside world. As the eruption unfolded disaster risk managers and humanitarians scrabbled to understand the severity of the crisis, uncertain of where to seek information vital to help coordinate their emergency response. With the risk of large magnitude eruptions estimated at 1 in 6 per century, more must be done to increase our preparedness for such events.

To address this, we convened a workshop bringing together a group of interdisciplinary researchers from volcanology, climate science, and food security along with disaster risk managers, humanitarians, policy makers, journalists, and artists. Through a range of interactive discussions and activities, participants were challenged to consider how we can best prepare for large magnitude eruptions and develop actionable recommendations for increased our resilience. Here, we will discuss the outcome of the workshop and what actions might be most effective from mitigating the impacts going forward. Some recommended actions included the need for a coordinated organisation responsible for collating information to support rapid response campaigns during volcanic eruptions, including the provision of satellite imagery and pinpointing the risk localities, as well as increasing and improving volcano monitoring, and pre-eruptive preparedness.

UKADR ABS-2023-057

Enhancing University-Enterprise Collaborations: A Framework for Disaster Resilience in Asia

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Keywords: **University-Enterprise Collaborations, Disasters, Enterprises, Universities**

Abstract

Recent studies and the Sendai Mid-Term Review have emphasised that strengthening disaster resilience cannot be accomplished by working in isolation. It necessitates a multi-stakeholder approach at various levels of engagement. However, some studies in Asia have revealed very limited University-Enterprise Collaboration (UEC), despite its high levels of disaster risk. These studies have found that DRR activities are undertaken by the governmental and private sector, organisations and volunteers, but mostly as separate entities. This could lead to inefficiencies, overlapping of efforts, and a failure to use and build upon existing knowledge. Universities are recognised as having a crucial role in bringing stakeholders together to develop innovative solutions through research and development. This is an account of a study to develop a framework for improving UEC, initiated as part of the SECRA (Strengthening University-Enterprise Collaboration for Resilient Communities in Asia) project, a collaborative effort to strengthen UEC in Asia. The study involved a comprehensive literature review and expert workshops to identify the challenges and enablers for UECs in Asia. Peer reviewed literature was selected and reviewed to understand the status of UEC in Asia, and any barriers and enablers that had been documented. These results informed expert workshops held across the Philippines, Thailand and Sri Lanka, which were used to explore and validate the findings in different contexts. The data was analysed thematically to highlight the importance of UECs for disaster resilience, particularly during the pandemic. Data was also analysed to identify factors influencing UECs, identify existing collaborative frameworks, and emphasise the importance of a relational framework for strengthening UECs. These elements were presented and refined at a series of multi-disciplinary and international expert workshops held in 2021. The study uncovered over thirty different factors influencing the UEC. As thematic areas, the factors are classified as cultural, structural, relational, and material. Furthermore, the literature review discovered several good practices implemented to support UECs. These results can help inform a more systematic, institutionalised, and monitored framework and policy dialogue for strengthening UEC in Asia.

UKADR ABS-2023-081

Disasters and Justice: An Investigation on the Characteristics of Justice within Disaster Contexts

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Keywords: ***Disasters, Disaster Justice, Inequalities, Vulnerability***

Abstract

Disasters are a phenomenon in a given society that can alter the entire lives of the people who have been affected. The overall disaster process intensifies the existing inequalities by significantly impacting vulnerable communities. Due to this, the narrative on causes of disasters was changed from being an act of God to an act of society, and the perception of disasters was altered from misfortune to injustice. With the arbitrary impact of disasters on a selected proportion of communities, the need for fairness and justice has been endorsed. This led to the development of the evolving concept of 'disaster justice', which considers how disasters enhance societal vulnerabilities. In this context, this study is dedicated to investigating the concept of disaster justice to recognise its vital characteristics. This study is the initial stage of a current Doctoral research project that will integrate disaster justice within the context of Disaster Risk Governance. The study was initially conducted based on a systematic literature review where articles that referred to the concept of disaster justice were selected for qualitative content analysis. Based on the content analysis, the characteristics of disaster justice were recognised based on socioeconomic, environmental, spatial, legal and political dimensions. These dimensions endorse the role of disaster justice in considering the voices of the vulnerable in disaster-related decision-making, unequal distribution of social and environmental goods, the role of space in disasters, legal liability in disasters and the government's accountability towards disasters. Based on these characteristics of disaster justice, it is evident that it is a broader concept that covers a spectrum of elements of society to make disaster contexts less vulnerable. The research further emphasises the need for the development of a framework to enhance disaster justice in the sphere of disaster management.

UKADR ABS-2023-092

Disability and Identity in Times of Crisis in Central Nepal: Balancing Urgency and Inclusion in Disaster Risk Reduction

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Keywords: ***Disability, Disaster Risk Reduction, Inclusion, Risk Governance***

Abstract

Those who identify as disabled are amongst the most at risk from the impacts of extreme events, including those associated with climate change (IRFC, 2007). The cultural and policy significance afforded to disability can either amplify inclusion or exclusion in public life from the community to the national level. Extreme events expose the pre-existing inequalities and tensions in the way societies, communities, and individuals manage their lives, cope with and respond to adversity (Kates *et al.* 2006). This reveals the coping strategies and behaviours of vulnerable groups and their relationship to representation in policy discourse. The project asks, through the case of the 2015 Ghorka earthquake Nepal, if urgent disaster response and resilience building has enabled or hindered struggles for inclusion in public life and collective action, through the acute experiences of people with disabilities. It does so through discursive policy analysis of policy documents from 2006 until present as well as semi-structured interviews with policy actors, disaster practitioners, people with disabilities in leadership positions and people with disabilities resident of Sindupalchowk, Nepal. It tracks how those currently identifying as disabled experienced the 2015 earthquake in the central Nepal and its recovery and the ways that response and resilience building has impacted on or been used to change the way disability is imagined and incorporated in policy and legislation. It presents evidence from Nepal of people with disabilities as active changemakers and contributors in shaping the direction of policy and intervention and demonstrates that the 2015 Ghorka earthquake enabled a shift in the institutionalisation of ideas about disability.

Unlimited Responsibility and Power: The Historical and Ideological Origins of Disaster Politics in Contemporary China

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Keywords: *Disaster Politics, Contemporary China, Marxism, Imperial China*

Abstract

The most distinctive feature of disaster politics in contemporary China is that the central government has nearly unlimited responsibility and power over disaster response. In order to respond effectively to disasters, the government would rapidly expand its power to implement emergency administration. This is shaped by both China's historical tradition of disasters and Marxism ideology. In studies of imperial China, disasters have been widely recognized as a key factor in the survival of the regime, even affecting the state building. In the two regime changes of modern China, governmental attitudes toward disaster response have largely influenced the winning of the people's hearts. On the other hand, the Marxist classics claimed that the control of capital was the reason for the frequency of disasters despite the progress of productive forces, and that the state therefore needed to take the lead in responding to disasters. This model was further reinforced by the experience of the CCP's early years in power and the strong response to disasters in other socialist countries. By analyzing unique contemporary cases in China, macro-level issues of political cultures can be reintroduced into the study of disaster politics.

Theme 10:

Economic Resilience and Information Management

The Ethics of Using Satellite Data to Monitor and Publish Research on Geohazards in Regions of Political Complexity

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Abstract

This paper discusses the ethical dilemmas encountered when using satellite data to study land subsidence in a country that is politically complex for UK scientists. Using satellite data, 99 rapidly subsiding areas have been identified across the country. Some of the fastest subsidence rates in the world (>300mm/yr) impact the country's most densely populated (~10,000/km^2) regions. We have constructed an open-access, online subsidence portal with the aim of sharing our findings with stakeholders.

Due to the political context of the study area, it is not possible to visit nor involve local voices in our design process. In a broader context, with the recent advocacy for openly available, online satellite data, how or should the voices of societies in this imagery be consulted before data dissemination? and is the drive for open access putting people at risk? Furthermore, in the UK no ethical review process is required for the use, analysis, or dissemination of satellite data that images humans or infrastructure.

Key informant interviews with remote sensing experts found that perceptions of risks and ethics of using satellite data in these contexts vary strongly within the UK research community. Influences include research aims, institute principles, nationality, and individual and perceived group morals. In a community promoting Open Science, there is a lack of discussion on the use of satellite data in certain contexts e.g., conflict regions, devastating disasters, or critical or disputed resources. We advocate for more ethical guidance with such nuanced cases. Further recommendations from this study suggest academic collaboration and effective use of social media may support data dissemination and bypass the impacts of political sanctions. This paper therefore aims to stimulate discussion on the provision of satellite data through open-access platforms. This access facilitates scientific progression and informed decision making when reaching this data otherwise would prove incredibly difficult.

UKADR ABS-2023-017

Data Policy for Open Science in Times of Crisis - Developing Guidance, a Checklist, and a Factsheet as Contributions to the UNESCO Open Science Toolkit

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Keywords: ***Disasters, Emergencies, Crises, Data, Policy, Open Science, International Partners***

Abstract

The United Nations Educational, Scientific and Cultural Organization (UNESCO) *Recommendation on Open Science* (2021) is the first international standard-setting instrument for open science. The *Open Science Toolkit* is a living and evolving resource, comprising guides, policy briefs, factsheets, and indexes. This proposal is to add elements to the *UNESCO Open Science Toolkit* by developing guidance, a checklist, and a factsheet specifically on 'Data policy in times of crisis situations using the open science platform'. The work is intended to support the implementation of the *UNESCO Recommendation on Open Science* while contributing to evidence informed decision making in the management and governance of crises with reference to the *UNESCO Recommendation on the Ethics of Artificial Intelligence,* (2022), the *UNESCO Open data for AI – what now?* (2023), and the *UNDRR/ISC Hazard Information Profiles* (2021) [now being updated by the UNDRR/ISC Steering Group for the *Global Platform for DRR* May 2025].

The principal objective of the toolkit proposed here is to provide a **comprehensive and practical resource** that supports the development, implementation, and monitoring of data policies for open science during crises. The tools developed in this project are intended to assist policymakers, scientists, researchers, institutions, data managers, data stewards and data scientists in effectively collecting, processing, managing, and governing data in a crisis context. The data falling within the scope of 'crisis-related research' needs also to be considered within the research data lifecycle, the data value chain, and across the various stages of the disaster management cycle: preparedness, mitigation, response, and recovery.

The project aligns to initiatives within other United Nations organisations and agencies particularly WHO, UNDRR and WMO and with several other related activities including the International Science Council (ISC) activities on emergencies and the Science Futures Office, the ISC World Data System (WDS) and the Research Data Alliance (RDA) and CODATA Data Systems, Tools, and Services for Crisis Situations Working Group. An extensive engagement plan has been developed seeking collaboration with the following open science related organisations, networks, or platforms: It is proposed that the toolkit will be launched at the UN World Data Forum that will be held in Medellín, Colombia in November 2024.

UKADR ABS-2023-020

Challenges and Mitigations in Disaster Related Statistics Reporting

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Abstract

The Sendai Framework for Disaster Risk Reduction encourages accurate data reporting from Member States to understand the true burden of disasters. Despite existing guidance published by intergovernmental organisations, producers and users of disaster-related statistics (DRS) face challenges in data reporting. This project aimed to explore conceptual and operational challenges in DRS production and identify potential mitigations. Additionally, it assessed the usability of the UNDRR/ISC Hazard Information Profiles (HIPs) as a basis for developing statistical definitions and technical guidance.

The UKHSA project team undertook expert interviews, expert and country partner focus groups, surveys and an in-person workshop with national statistical offices, disaster management agencies and global disaster management experts. An iterative process was deployed using thematic analysis to generate discussion topics for subsequent stages. In total, participants represented 51 countries and all UN regional groups. The report outlines current challenges in DRS reporting, recommends potential mitigations and highlights the potential of the HIPs to address key challenges.

Country partners and international disaster database managers reported challenges in DRS reporting. Some experts provided a positive assessment of the HIPs. Adopting single hazard taxonomies for hazard classification, impact attribution, risk management, and enhanced international collaboration were identified as potential benefits. However, challenges included legislative, technical, resource, and coordination-related issues. Potential concerns identified included excessive detail in the HIPs and lack of local contextualisation. Subsequently a series of recommendations were developed for UN agencies, national, and regional organisations to enhance DRS reporting processes.

Recommendations include taking a flexible and dynamic approach to HIPs adoption, prioritising knowledge and capacity building, strengthened institutional arrangements, enhanced international collaboration and refined guidance communication.

UKADR ABS-2023-041

Identifying What Data Works for Disaster Risk Reduction and Response in Marginalised Localities

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Abstract

Investment in disaster risk reduction and response subsumes an orientation to research impact in answering to the high ideals of human and planetary survivability. This includes intellectual, policy and practice investments driven by real world actions that are born out in times of rapid and slow onset emergency situations. Albeit dependent on information and data sharing, imbalances persist between unequivocable visual, narrative and numeric evidence of loss and damage causality and the level of intervention that ensues. Inadequate action along critical fronts of prevention and response globally suggests that beyond lacking data and information in some contexts, there is also a persistent problem of the way data connects to decision making at multiple levels. To this end an ongoing focus on action data has been reinvigorated to inquire in more depth as to what data is proving to really work in the interests of disaster risk reduction and response at all levels. A wide consultation on this issue is being activated under the umbrella of a Committee of the Global Alliance of Disaster Research Institutes that can be elaborated across the Regional Disaster Research Alliances. The current paper presentation will examine the rationale and some initial findings of the initiative based on the case of more marginalised localities where some intense learning about action data from the local level has been possible.

UKADR ABS-2023-063

Assessment of Entrepreneurial Resilience among Small and Medium Women Entrepreneurs in South Asia: A Desk Review

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Keywords: ***Challenges, Resilience, South Asia, Women Entrepreneurs***

Small, and Medium Entrepreneurs (SMEs) significantly contributes economies and social systems through employment generation, trade facilitation, production and overall societal development. Despite their importance, SMEs face many different challenges for their growth and continuation. Specifically, South Asian entrepreneurs face unique challenges compared to other regions due to high external shocks such as disaster risks, weak governance structures, limited resource availability and poor infrastructure facilities.

Among these entrepreneurs, women entrepreneurs in South Asia face further complexities and challenges compared to others. For example, lack of access to finance, information and communication, training, credit, and support networks, time management, sociocultural constraints, lack of family support, role expectation conflict, discrimination and stereotyping, and so on. These challenges may differ depending on age, marital status, education, experience, level of family support, and income, among other factors. As a result, they easily give up their commitments and interests to expand their business specially during the initial stage of their businesses. However, during the COVID-19 pandemic some success stories have been reported among women entrepreneurs.

Despite the social and economic importance of SMEs headed by women entrepreneurs in South Asia, there is very little literature available on their resilience. To fill this research gap, this study was conducted to examine the impact of recent disasters (e.g., COVID-19) on women entrepreneurs in the SME (2) explore the challenges caused by disasters on women entrepreneurs and (3) investigate on any enablers that enhance resilience among women entrepreneurs in South Asia.

The study was conducted as systematic literature review following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The study covered a period from 2017 to 2023 with the research focus on the South Asian Countries. The study revealed that some cultural and religious barriers continue to be major sources of constraints for the education and financing of female entrepreneurs in South Asia. Furthermore, studies on the impact of COVID-19 reveal a significant bias towards women's empowerment in ICT, digitization, and e-commerce, emphasising the importance of gender-balanced policies and government interventions. The study also revealed family support as a key enabler for their success. Women's empowerment, on the other hand, has yet to be realised and has been ignored by society.

Appraising Investments in Disaster Risk Reduction: A Systematic Literature Review

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Keywords:　　*Disaster Risk Reduction, Investments, Return on Investment*

Abstract

Challenges persist in increasing investments for disaster risk reduction (DRR) due to uncertainties surrounding the associated benefits and the underestimation of said benefits. Notwithstanding these challenges, the need for proactive DRR measures and investments remains compelling, because of the damage these events can do to growth and sustainable development. Consequently, the extant literature contains many studies that quantify the costs and benefits of such investments, thereby providing justification for their allocation of resources. Despite the number of studies assessing the economic feasibility of DRR investments, a systematization of findings of such studies is lacking. Therefore, this study aims to organize previous findings assessing the feasibility of the DRR investments through a systematic literature review. A selection of 89 relevant articles sourced from the Scopus database forms the dataset of this review. The findings were organized by different themes, the techniques used to assess the feasibility of DRR investments, the types of costs and benefits considered for investment appraisal, and the merits and shortcomings identified by studies related to the appraisal techniques. Additionally, the types of hazards considered for DRR investments, and the study contexts were identified. Notably, many studies were focussed on the USA and majority of the investment appraisals were conducted for investments on flood mitigation. The review underscores that cost benefit analysis was the prominently used method for appraising DRR investments. Cost determination was straightforward, encompassing the investment and the maintenance costs. However, disparities are evident in the approaches adopted to assess the benefits, particularly when assessing the indirect benefits of the investment. Based on these findings, the authors propose future avenues for research and policy recommendations aimed at strengthening investments in DRR.

UKADR ABS-2023-103

Theme 11:

Nature-Based Solutions, Environmental Resilience and Sustainability

Neighbourhood Experiences of Urban Greening for Heat Resilience Across Cities in Different Climates

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Keywords: **Community Resilience, Extreme Heat, Nature-Based Solutions, Participatory Research**

Abstract

Extreme heat in cities is an ever-increasing risk to human life and wellbeing under a warming climate. Research and practical experiences globally show that green and natural spaces can reduce heat risk in neighbourhoods. However, to realise these heat resilience benefits into the future, urban greening initiatives need to be supported by people with the skills and capabilities to look after greenery long-term. There may also need to be trade-offs between cooling, and other resilience benefits that green spaces may provide.

The research problem this study address is: how can green spaces be planned better to build heat resilience? We held workshops with residents in two neighbourhoods each in two cities: Glasgow, Scotland and Taipei, Taiwan. We asked residents to draw maps of the green spaces in their neighbourhood, and to use these to tell us who and where they thought was at most risk under hot weather, as well as how the neighbourhood could be improved to reduce climate risk.

In both Glasgow and Taipei, we found that walking long distances is common practice in less wealthy neighbourhoods due to limited transportation links, which significantly increases heat risk if there are no street trees to provide shading. We also found that even if green and open space is abundant in a neighbourhood, it may not necessarily be accessible or of good quality, and hence may not provide benefits to residents. We also heard that residents felt a strong disconnect between their own experiences of the lived environment, compared to how their neighbourhoods were planned and managed by local government.

For urban greening to support resilience to extreme heat, the key research and practice implications of our work are as follows: (a) residents' own experiences of extreme heat and of the green spaces they live in are often very different from how these are imagined in local government plans and policies. Platforms and mechanisms that bring residents' lived experience into greenspace and heat resilience planning are strongly advised; (b) cooling may be only one of a number of benefits that residents receive from green spaces, alongside interaction and wellbeing. Interdisciplinary approaches which can assess the potential trade-offs between different contributions from green spaces, including residents' own knowledges and experiences, are thus vital to maximise the heat resilience benefits of urban green spaces.

Tropical Agroecosystem Resilience for a Sustainable Future: A Framework for Higher Education Institutions in Sri Lanka

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Keywords: *Agro Ecosystems, Resilience, Higher Education, Sri Lanka*

Abstract

Agro-ecosystem resilience is one of the factors that impacts global food security and society's ability to eradicate hunger. However, climate change and other anthropogenic factors have harmed the resilience of agro-ecosystem worldwide. Like many other countries, agriculture plays a major role in the Sri Lankan economy by contributing to Gross Domestic Product (GDP) and employment generation. However, the agro-ecosystem in the country has been vulnerable to several hazards, mainly floods and droughts. Lack of awareness and knowledge about resilience mechanisms contributes to the country's agro-ecosystem's insecurity. Higher education institutions have been identified as an important source of knowledge and solutions that can build agro-ecosystems resilience. Therefore, this study was carried out to investigate the key concepts related to agro-ecosystem resilience, with the aim of developing a framework to support research and the development of related knowledge within higher education institutions. The study was carried out as a part of three year international collaborative capacity building project, entitled BRITAE (Building Resilience in Tropical Agro-ecosystem). The study involved two literature reviews (global and local perspectives), a questionnaire survey, and an institutional report among Sri Lankan higher education institutions. A thematic analysis was performed to extract key themes from the various sources, and relevant information on each theme was generated using classification techniques. The framework depicted three orders of concepts derived from the analysis to illustrate the results. Five thematic areas revealed twenty-one second-order concepts. Resilience included socio-ecological resilience, sustainability, disaster risk, and climate change. Agro-ecosystem was broken down into agro-ecosystem resilience, urban agro-ecosystem, agricultural vulnerability, crops and livestock, impact, and land-use patterns. Higher education included second order concepts on networking, capacity building, research and development, teaching and learning, and knowledge. The environment covered environmental issues, sustainable ecosystems, and ecosystems. Finally, policy and governance addressed international policies and national policies. The resultant framework can provide a basis for developing new knowledge and solutions in these areas, and introducing new or reviewing existing degree programmes that can contribute to improving the resilience of agro-ecosystem in Sri Lanka.

UKADR ABS-2023-080

Combating Flood Risk Disaster: Approach and Techniques for a Resilience Built Environment in an Emerging Economy

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Keywords: ***Built Environment, Emerging Economies, Flood Risk, Resilience***

Abstract

Due to global warming and climate change, the impact on the built environment threatens human existence. Globally, flooding has ravaged economies both developed and emerging economies. For instance, emerging economies like Nigeria face significant impediments in combating flood risk due to population density, urbanization growth and climate change. Despite the event of flooding, different approaches have been put forward to combat this occurrence to build an environment resilient and free from flood risk.

Therefore, this study investigates the common techniques and approaches for combating flood risk disasters. To achieve this, a systematic approach was deployed to understand and gain insight into tackling the threat posed by floods and implore strategies to enhance risk reduction and urban resilience measures for a sustainable environment. The paper also highlights the risk factors and the level of exposure/vulnerability in the built environment. Data for the study was extracted from Web of Science and Scopus, covering 20 years (2003-2023).

Findings revealed the integration of structural and non-structural systems, including an early warning system, mapping of flood risk areas, educating and community engagement, building flood infrastructure like drainage, flood wall bridges, elevation of buildings and international collaboration. The approaches in this study will help stakeholders in the built environment and researchers understand and combat risk disasters for sustainable urban development especially in developing countries.

UKADR ABS-2023-095

Nature-Inspired Solutions (NiS) for Disaster Risk Reduction (DRR): Understanding the Opportunities, Gaps and Way Forward

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Abstract

Nature-based Solutions (NbS) are increasingly recognised as vital strategies for disaster risk reduction (DRR). These involve actions that protect, sustainably manage, and restore natural or modified ecosystems to help protect vulnerable communities. While implementation of NbS is growing, uptake varies widely, and many barriers have been encountered, including governmental, financial, and technical, as well as the mixed and scarce evidence for their effectiveness, and challenges in upscaling. Nature-inspired Solutions (NiS) have also been successfully employed in other contexts and may provide an alternative where NbS solutions are not viable. These involve learning from and mimicking the strategies found in nature to address a range of design, engineering, and human challenges. Although there has been growing interest in NbS for DRR, there has been limited attention on the use of NiS to help protect communities, despite its apparent effectiveness in addressing other societal challenges. This study was carried out to better understand the state of the art and potential application of NiS to reduce disaster risk. The study involved a systematic literature review to produce an initial conceptual framework. This formed the basis for 34 semi-structured interviews carried out among experts from a range of related disciplines. The results were further explored and validated in Sri Lanka, through a focus group discussion with multi-disciplinary experts. Key findings were classified into four thematic areas related to industry and policy, academia, research and development, and mainstreaming NIS in Sri Lanka. The results revealed a poor awareness and understanding of the NiS concept, and confusion with NbS. Despite this, many saw significant potential in the concept and felt it could drive the development of novel solutions for DRR, and complement existing grey, green and blue infrastructure. This has laid the foundation for an extended study that focuses on raising awareness and capacity building among built environmental professionals on NiS and understanding and documenting nature's strategies and principles in coastal protection and landslide prevention.

UKADR ABS-2023-099

Achieving Corporate Sustainability Performance through Facilities Management Innovations

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Abstract

Despite the extensive applications of technological innovations in facilities management, and the benefits firms derive from sustainability practices, academic research appears to have overlooked how infrastructure development and facilities management innovations contribute to corporate sustainability performance. The overall purpose of this proposed study, therefore, is to investigate the effects of infrastructure development and facilities management innovations on corporate sustainability performance. To achieve this the research objective is to investigate the factors that lead to facilities management innovations in corporate environments and   to investigate the use of innovative resources for facilities management within corporate environments and how these affects.

- Social Dimension

- Economic Dimension and

- Environmental Dimension of Corporate Sustainability Performance

Implementing cross-sectional survey design, and relating organized investigation instrument for data gathering, this study Integrates records from secondary date, journals, personal writing, and diaries this study clearly demonstrates a correlation between facilities management innovation in achieving corporate sustainability performance.

It therefore argues for the factors that will influence an organization to settle on an FM innovation and the available resources to be used for the selection made. These concerns are particularly evidential in most African countries like Ghana and its conclude that FM innovations are critical in achieving corporate sustainability performance.

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Theme 12:

Climate Change Adaptation

Status of Climate Change Education in the Context of Sri Lankan Secondary Education System

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Keywords: **Climate Change, Education, Sri Lanka**

Abstract

Climate change education in schools enhances the community awareness on understanding the impacts of climate change, and inculcating the knowledge, skills, values, and attitudes needed to act as change agents. However, current school education systems in developing nations seem lacking the capacities of enhancing relevant knowledge and skills of climate change, mitigation, and adaptation among young minds. Therefore, the primary goal of this research is to identify the gaps in the school curriculum concerning climate change, mitigation, and adaptation using Sri Lanka as a case study. School curriculum in Sri Lanka which has been divided into three categories: junior secondary (grades 6-9), senior secondary (grades 10-11), and advanced secondary (grades 12-13) have been examined using school textbooks by the Educational Publication Department, teachers' guides by the National Institute of Education, and other published documents as secondary, qualitative data. This was an inductive study using the content analysis method. Results reveal that climate change is only mentioned in Geography and Science subjects under the Junior Secondary category as compulsory subjects for all students. Climate change is deeply discussed in Chemistry under the science stream and Geography under the arts stream in advanced secondary category. However, more than a quarter of students drop out after the public exams in grade 11 where they do not receive any deep understanding of climate change, mitigation, and adaptation. Moreover, existing syllabuses are focused on causes and impacts of climate change with less focus on mitigation and adaptation practices. Therefore, developing junior secondary subjects with more practical knowledge related to day-to-day life focusing on mitigation and adaptation strategies seems essential when it comes to enhancing community awareness on climate change, mitigation, and adaptation. This will encourage more community-based initiatives and community involvement in implementing climate change mitigation and adaptation strategies successfully in the long run.

Climate Change Adaptation through Heritage: A Case Study in Community-Led Approaches in South Africa

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Abstract

People-led adaptation is an advocated approach that should support groups of vulnerable people to develop their own adaptation pathway enabling them to reduce or manage climate risk. The terms community, participation and even adaptation can be controversial in terms of the de-colonisation of research and contested as rhetoric. We present findings from an applied adaptation research project in Elandskloof, South Africa, that examined people-led adaptation through the lens of cultural heritage.

In a context plagued by historical injustice, internal and external distrust, as well as a changing climate, an interdisciplinary team of researchers supported a 'community' group in Elandskloof to: 1. identify their climate and social risks; 2. find a common need or gap and 3. implement an adaptation solution.

A heritage-based risk assessment identified the need for discourse on climate change across the fractured settlement, as well as a need to revitalise horticultural knowledge lost during apartheid and the removal of the people from their homes and land. A small group of people were brought together as climate champions and through them, researchers at University of Pretoria supported and encouraged the development of a shared garden. This was to encourage a sharing of skills and intergenerational knowledge on horticulture, food heritage and the environment. Unexpectedly, the garden has also acted as a focus point for hope, proving to people living in this fractured settlement that they can work together and produce something beneficial and positive. This has also been demonstrated to external supporters leading to tentative discussions with the national government of implementing a micro-grid and further support from a local CSO.

We critique the methods and present findings from this applied research project illustrating the people-led adaptation can be an effective tool, whilst heritage can act as a gateway topic for engagement and the identification of risks.

UKADR ABS-2023-014

A Review of What Matters in Climate Change Education based on Experiences in England

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Abstract

Climate change is a dire 21st century challenge, imperils humanity globally, including the United Kingdom. Climate change education is an important aspect in addressing the complexities of climate change. However, there are disparities in the depth, the scope, and how climate change is integrated within national education curriculums. This can pose a significant challenge when attempting to foster comprehensive understanding and action amongst the next generation.

Currently, there is varied levels of climate change incorporation in the national curriculum have led to unequal student understanding, limited teachers' preparedness, and ethical dilemmas in teaching such a controversial subject as climate change. This study aims to investigate the details of climate change within England's education system. This includes what is the depth of the content, how prepared are teachers, what are the ethical considerations, and the student comprehension of the subject. To aim of the study is to uncover opportunities that can help guide the development and enhancement of climate change education need to align a modern 21st century crisis.

This study uses a comprehensive review of the literature, which incorporates an analysis of the national curricula, teacher perceptions of climate and preparedness to teach the subject, student understanding of differing elements of climate change, ethical considerations in teaching climate change, and societal viewpoints about the inclusion of climate change education in the national curriculum. In addition, this study also uses a mix-method approaches, including secondary surveys (mostly from YouGov), and primary interviews, which were used to capture a diverse perspective and assemble empirical data.

It was found that there were disparities in the integration of climate change content within the curriculum, both at an international level, but also nationally due to the academisation which started in the early 2000's. Also, teacher preparedness to the subject emerges as a concern, with inadequate training been provided (especially since it is a subject of constant change currently); and there are ethically dilemmas are shaping the teaching landscape of the subject, which need to be addressed. Lastly, students have exhibited varying levels of understanding of the subject, which are marked by prevalent misconceptions of the subject, and incomplete awareness of climate change science and implications.

Therefore, the study highlights the imperative for an enhanced national curriculum for climate change within England. It also emphases the urgency of addressing teacher preparedness in teaching the subject, but also better discuss ethical concerns. Lastly, there is a need for a more holistic understanding of climate change, which empowers the students to navigate the complexities of this crisis more effectively than currently.

Pro-Environmental Behaviour and Climate Change: A New Hope

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Keywords: **Climate Change, Pro-Environmental Behaviour, Hopelessness, Resilience**

Abstract

The statistics and forecasts around the impacts of climate change paint a bleak picture of the future of humanity. One component of climate change mitigation would be to encourage pro-environmental behaviour at multiple levels, including individual responsibility. However, there is an emerging theme that the problem feels 'too big' for individuals to feel like any behaviours they engage with are anything more than futile. Therefore, 'climate despair'—a sense of hopelessness about humanity's ability to pursue a sustainable future—is emerging as a psychosocial threat, defined as a cognitive schema characterized by negative expectancies. Our work suggests that learning about eco-innovations—novel climate-response options—can decrease individual perceptions of climate hopelessness, measured by an amended version of the Beck Hopelessness Scale. Across 11 experiments (N = 3,028) we found that convenience samples of adults reported lower climate hopelessness after viewing videos that depicted eco-innovations (such as a high-tech, net-zero-energy city) than they did in various control conditions, including those that were unrelated to climate (such as a no-video control) and those that depicted traditional climate responses (such as living in a rural, intentional community). This research provides experimental evidence that thinking about novel climate responses can contribute to a more hopeful outlook, and it identifies technological innovation as one possible seed for such messaging. We also explore how this increase in hope surrounding climate change might translate into behaviour, presenting our latest findings used a physical behaviour task-post hope induction.

UKADR ABS-2023-089

Challenges of Built Environment Stakeholders in Climate Change Adaptation

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Keywords: ***Climate Change Adaptation, Built Environment Stakeholders***

Abstract

There is an urgent need to translate climate change awareness into tangible climate adaptation strategies. While the built environment largely contributes to the climate change triggering factors, it also becomes highly vulnerable in the face of climate change impacts. Tied up with the interconnectedness of the built environment processes and associated systems, the involvement of numerous stakeholders from different spectrums creates the need for a holistic and multi-stakeholder approach in developing climate response strategies for the built environment. The study reveals the challenges and response strategies of different built environment stakeholders in handling climate change adaptation.

The data has been collected by country-level contextualising studies in the United Kingdom, Spain, Malta, Sweden, and Sri Lanka using semi-structured interviews. Accordingly, the challenges faced by six stakeholder categories: National and Local governments, The Private Sector, Academia and Research Organizations, Civil organisations and Professional Bodies and communities are summarised with their potential response strategies. The findings have been validated using two stakeholder workshops in Malta and Sri Lanka. National governments face climate information gaps, funding constraints and climate awareness issues, while local governments experience decentralisation issues. The private sector faces difficulties handling government agencies and legislation and issues due to a lack of incentives and recognition in effectively implementing adaptation plans. Academics and research organisations have limited opportunities, communication gaps and technological barriers. On the other hand, civil organisations and professional bodies have limited training opportunities, a gap between scientific knowledge and practice, and institutional barriers. The public or communities need clarity over information sources, more familiarisation with concepts, and a clear understanding of the climate change processes. Addressing these challenges through potential response strategies demonstrates a clear pathway for improving the contribution of built environment stakeholders for climate change adaptation.

Bridging urban resilience implementation challenges in tackling climate-related disasters

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Abstract

There have been several calls to make cities resilient in the recent past, such as MCR2030 Making cities resilient, launched by UNDRR; Cities Race to Resilience, launched by UNFCC; Cities Solve, Cities Deliver, launched by Resilient cities network; and City resilience framework by the Rockefeller Foundation. Though there have been many campaigns, tools, and frameworks for making cities resilient, none of these are specific to climate-related disasters. On the other hand, urban resilience implementation in relation to climate-related disasters remains a challenge, especially for developing countries. As the cities are typically at the forefront of the issues related to climate-related disasters, they must develop innovative actions and initiatives to meet the challenges. Accordingly, aim of this research is to review global campaigns, tools and frameworks on urban resilience with a particular emphasis on climate-related disasters and to explore the urban resilience implementation challenges faced by developing nations. A systematic review of global campaigns, tools, and frameworks for enhancing urban resilience to climate-related disasters in developing nations was conducted. The campaigns and frameworks identified highlight the global recognition of the need for proactive measures to mitigate, adapt and recover from climate-related disasters. Challenges highlighted in the literature range from resource constraints and institutional constraints to issues of governance, equity, and community inclusion. The diverse and complex nature of these challenges requires a context-specific approach that considers the unique socio-economic, cultural and environmental contexts of each developing country.

Theme 13:

Community and Local Approaches

Foretelling the Rains: The Dynamics of Knowledge Resources in the Drylands of Kenya and Somaliland

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Keywords: **_Drought, Forecasting, Traditional Knowledge, Water Security_**

Abstract

In the drylands of East Africa, access to reliable advice about the timing and quality of up-coming rainy seasons is, or ought to be, a precious knowledge resource. As meteorological services gradually extend their reach and capacities, recent decades have seen the introduction of new forms of forecasting knowledge to communities in the region. These provide advance information on expected rainfall patterns and issue early warnings of drought and flood risk, via extension workers, radio broadcasts and digital services. Yet they enter a knowledge space that is by no means vacant. People in the region have long turned to traditional forecasting experts for advice, as well as relying on their own specialist knowledge drawn from experience in working the land. Indigenous methods essentially involve the interpretation of visual signs within the environment.

As part of a broader research programme on water stress and climate change in the region, Down2Earth, a team of researchers and development practitioners analysed preferences for different sources of knowledge on seasonality in six sites in Kenya and Somaliland. We explored perspectives on information sources through 96 semi-structured interviews incorporating scenario exercises with men and women from the villages, combined with 15 local key informant interviews (including 8 traditional forecasters). The results present an interesting picture of change and tradition, with many different and co-existing shades of opinion, shaped by aspirations to modernization, but also by recognition of the value of indigenous knowledge sources, and by personally and socially differentiated relations of trust and experience. The increasing turn to modern sources may well be inexorable, but it is clear that this is not a simple dynamic, and many people actively draw advice from multiple sources (including some traditional forecasters themselves). Understanding knowledge resources and dynamics in-depth is key, we argue, for effective DRR and adaptation support.

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Outcomes and Enablers of Volunteer Participation in Flood Early Warning in England

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Keywords: ***Community-Based, Early Warning System, Disasters, Flood, Natural Hazard***

Abstract

Community participation in early warning for natural hazards is suggested to lead to improved early warning outcomes, such as strengthened communication and dissemination of warnings, and improved response of those at risk. The active participation of communities is therefore often suggested as a means to strengthen early warning. However, previous studies on participation in early warning have mainly focused on how participation takes place, and while the contributions of volunteers to flood risk management have been studied more widely, the outcomes of participation in early warning have not received much attention. It will be important to understand what outcomes of community participation can be expected if it is to be applied to strengthen flood warning. In England, flood groups and flood wardens are the primary ways community volunteers actively participate in flood warning. The aim of the study was to identify the perceived outcomes and enabling factors of volunteer participation in flood warning in England. A case study methodology was applied, with each case being a flood group or flood warden network operating in a local area. The different case studies represent different flood types (fluvial and surface water) and approaches (community-led or working with authorities). For each case, semi-structured interviews were carried out with the volunteers and a review of related documents (community plans, reports, news articles) was conducted. The data was analysed thematically using qualitative data analysis software. The findings will identify the main actions the volunteers are taking in relation to flood warning, and the outcomes the volunteers perceive to arise from their actions. The enabling factors and barriers to participation and achievement of the outcomes will be presented. Overall, the findings will provide an understanding of community participation in flood warning and indicate potential ways forward for the use of participation to strengthen early warning.

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Understanding the Contribution of Local Communities and Their Knowledge for Disaster Risk Assessment

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Keywords: ***Community Resilience, Local Communities, Local Knowledge, Disaster Risk Assessment***

Abstract

Previous studies have pointed out that holistic and general disaster risk reduction (DRR) measures do not capture the micro level changes, processes, and context (location) specific characteristics that influence disaster risk within local environments. Therefore, implemented DRR measures appear to be less productive, making communities vulnerable to the increasing frequencies and intensities of natural hazards. Scholars have identified that local communities have the capacities, expertise, and knowledge to explore, understand, and monitor their local environment. However, local communities have often not been involved in the decision-making level, especially when assessing the disaster risk prior to the planning stages of DRR measures. This study aimed to understand the contribution of local communities and their knowledge in disaster risk assessment. The study was carried out in Sri Lanka, which is prone to floods and landslides, and specifically in the major catchments of "Kalu" and "Kelani" rivers. Semi-structured interviews and focus group discussions were conducted with experts and local communities from two landslide prone communities and two flood prone communities. A cross-case comparison was carried out using a thematic analysis. The findings revealed that many experts who are involved in DRR believe that integration of local communities and their knowledge into disaster risk assessment is important because of their awareness about recent and historical changes, and the interconnected processes of their local environment that influences the disaster risk. However, a lack of policy and legislative support, institutional egos, conflicts between scientific and local knowledge, and lack of trust among local communities, have divided local and scientific communities when it comes to risk assessment. Compared to floods, experts who are working on landslide mitigation have successfully integrated local communities in disaster monitoring and mitigation, yet not in the risk assessment process. The findings suggest that involving local communities in disaster risk assessment may provide micro level understanding about local environmental processes that need to be addressed as part of efforts to make communities more resilient.

Women Leadership in Disaster Management: The Case of Beirut Blast (Award-Winning Thesis)

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Keywords: **Women's Leadership, Disaster Management, Desicion-Making Process, Resilience-Building**

Abstract

Disaster affects men and women differently. Some research shows that women are more vulnerable than men in disasters. Due to gender inequality, women are more affected disproportionately by disasters, such as they are more likely to lose their livelihoods and houses, gender-based violence, and loss of life pre- and post-disaster. Although that, women show their capability to respond and recover from crisis through building community resilience and participating in disaster risk reduction.

Some theoretical approaches indicate the possibilities for Women's grassroots and non-profit organizations to adopt self-protective action in disasters based on their community work. In addition, some research indicates that women describe themselves as transformational leaders which have effective and impacted roles in disaster response plans. Even though, there is still a lack of research on women and disaster, particularly women leaders' roles in disaster management.

This research explores women's leadership in disaster management in Beirut Blast 2020 focusing on disaster response, mitigation, and recovery phase. The importance of the research is to broaden the literature on women's leadership and disaster management and to identify the significance of women's leadership and building its resilience in disaster risk reduction and social change. Data were based on different resources, mainly the UNDRR which includes a collection of best practices based on documented experiences of mainstreaming gender in disaster risk reduction.

The present research will benefit researchers as a testimony to the crucial role of women leaders in disaster management in the Beirut Blast. Furthermore, the information generated by the interviewees allowed us to get a comprehensive picture of the status of Lebanese women leaders in Beirut Blast (roles, challenges, motivations, and actions). Revealed findings provide a specific roadmap for conceptualizing and enhancing Women's Leadership.

The United Nations plays a dual role in the roadmap: first, advocating for gender-inclusive disaster response in Lebanon with feminist activists and women's rights groups, emphasizing the importance of gender differences and women's involvement in decision-making. Second, UN Women in Lebanon has established a Feminist Civil Society Platform to implement pre-disaster plans, monitor disaster responses, and promote women's long-term needs, including lobbying and advocacy for women's equitable inclusion in the public sphere.

Theme 14:

DRR Education and Information Systems

Standards for Official Statistics on Climate-Health Interactions

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Abstract

Following the success of a £5million Wellcome Trust bid, UKHSA and ONS are working in partnership with Ghana and Rwanda to deliver a four-year project on Standards for Official Statistics on Climate-Health Interactions.

Project aims:

• Supporting global providers of climate change statistics.

• Enabling comparable and reliable evidence of health impacts

• Supporting global action and policy change on climate change

The intended outputs are a statistical framework and unified methods for official reporting of climate change impacts on health, at national and local levels. This project will provide tools to operationalise indicators consistently and help build expert capacity across countries.

The discovery phase was completed in April 2023. This included establishing the scope for statistical framework metrics and identification of climate and health data. Scoping visits were undertaken to identify research partners, a literature review completed, a series of user workshops with low-and middle-income country (LMIC) representatives and the establishment of expert and international advisory groups.

The stakeholder engagement with international, service-user and academic experts has been instrumental in shaping the future project phases. Work has commenced on indicator development across 12 thematic areas jointly identified with LMIC partners. Positive engagement with the UNGP has enabled conceptualisation of the knowledge-sharing platform with agreed scope and requirements.

Lessons learnt from the discovery phase include the complexity of onboarding process for LMIC partners and the importance of ensuring sufficient project time is programmed to enable effective onboarding. The importance of maintaining momentum with expert working groups through a variety of communication approaches has been key.

Engaging LMIC partners in the early stages of the project is critical, to ensure they have an equitable role in project development to meet their needs. It is important that projects in the climate-health sphere acknowledge the need for a multi-faceted, multi-professional approach and early stakeholder engagement.

UKADR ABS-2023-040

Inclusive Disaster Education: The Key to Building Stronger, More Resilient Communities

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Abstract

Inclusivity in education is crucial, especially amidst the new risks such as digital inequality and digital power concentration. The COVID-19 pandemic has changed the education landscape in many ways. The abrupt transition to the present new normal, i.e., online education, demanded reimagining online/distance learning education to better support the diverse DRR (Disaster Risk Reduction) community. The research collaboration INCLUsive Disaster Education (INCLUDE) was implemented to achieve that aim. INCLUDE is a collaborative research project co-funded by the EU Erasmus+ programme, which focused on combating the adverse effects brought on by the emergency shift of education to an online setting in the post-Covid era. The project has produced a cMOOC (Connective Massive Open Online Courses) platform (amongst several others) to personalise student-centred learning and an online research repository with open educational resources in response to limited research visibility issues. Furthermore, the links between the potential of disruptive technologies in narrowing the gaps in digital disaster education were studied. The project was kicked off by reflecting on the effectiveness of existing online teaching/learning approaches in DRR, providing novel insights on how inclusive DRR education should be envisioned within the online setting, respecting different learner groups and highlighting the underrepresented DRR areas. The key findings of the research suggest accessibility as the link between inclusivity and flexibility in DRR education amidst learner difficulties. It also highlights the need for co-creation and development of online means for education beyond a traditional view of learners as passive recipients of knowledge. It recommends designing and delivering online/distance learning without exacerbating existing educational and social inequalities. As an immediate step to act upon the number of recommendations from this study, a framework was developed to build the capacity of DRR educators to implement digital education through improved digital pedagogical competences.

UKADR ABS-2023-083

Disaster Risk Reduction and Online Education: Development of a Digital Competency Framework to Enhance Digital Pedagogical Competencies of Educators in Disaster Risk Reduction

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Abstract

The COVID-19 pandemic was a novel biological hazard that emerged in 2019 and significantly impacted many sectors of society. While sectors such as the economy and health were severely affected, the education sector was no stranger to the grave impact of the pandemic. When the pandemic called for regulations such as lockdowns and social distancing, the education sector was required to shift the classrooms into distance digital-based classrooms, which led to several grave impacts. In this context, the EU Erasmus+ co-funded project titled INCLUsive Disaster Education (INCLUDE) was initiated to explore the solutions to these adverse impacts in the emergency shift towards digital education in the field of Disaster Risk Reduction (DRR) Education with partners from Lithuania, Japan, Sweden, and the United Kingdom. This abstract presents the digital competency framework for DRR educators to build their digital pedagogical competencies, that was developed as part of this research collaboration. The methodology adopted to develop this framework was threefold. The process initiated with a literature review to trace the main types of digital pedagogical competencies. Next, other existing output reports of the project were evaluated to investigate the relevant digital competencies the DRR educators require. Finally, the framework was developed by mapping the findings of the first two stages, and it was validated with the inputs of relevant experts. The literature review illustrated that knowledge, skills and attitudes have been recognised as critical in developing a digital competency framework. Accordingly, the competency framework was developed based on the said dimensions within the DRR education throughout the stages of preparation, execution and reflection. Further, the framework was based on the main virtues of responsiveness, adaptability and flexibility to consider the multidisciplinary, context-specific challenges of online DRR education. As a way forward, the research team recommends considering the role of institutions as the primary regulatory stakeholders in providing digital DRR education.

UKADR ABS-2023-090

The Effective Communication of Risk: Insights from Cognitive Science

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Keywords:	***Risk Communication, Decision Making, Cognitive Science, Graphical Representations***

Abstract

Research into the graphical representation of risk information is vital for two reasons. First, the communication of risk often needs to be accessible to audiences with varying degrees of literacy and numeracy and designed to overcome the cognitive and perceptual biases that lead people to misinterpret information or make inappropriate inferences about it. A well designed graphical representation can be a powerful risk communication medium to reduce misunderstanding and combat misinformation. Second, the increasingly large and complex datasets being generated today require substantial processing to transform them into graphical representations that domain experts can explore and interrogate productively, often in real time. If visual features and spatial relationships are used appropriately, graphical representations can exploit people's cognitive and perceptual capacities and biases to make key information salient, facilitate reasoning, and support informed decision making.

In this talk I explore some of the central topics in the field of information design as it applies to graphical representations and illustrate my discussion with examples of more and less effective designs for communicating risk. In doing so, I highlight the crucial role that cognitive science plays in revealing the constraints on designs placed by the particular characteristics of human cognition and perception. My aim is to demonstrate the value of cognitively informed graphical representations for risk communication and to argue that a deep understanding human cognitive and perceptual biases is essential for the effective representation and communication of risk.

Theme 15:

Poster Presentations

Hospital Disaster Preparedness for Mass-Casualty Incidents at Emergency Units in Northwest of Ethiopia: A Cross-Sectional Study

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Abstract

Background: Ethiopian policies and strategies aim to make healthcare systems capable of dealing with emergencies. However, Ethiopian health care still lacks a comprehensive "all-hazard" approach and disaster preparedness program. Ethiopia is vulnerable to the multiple hazards and disasters caused by climate change. No empirical study has been conducted in the Amhara Regional State to assess hospitals' preparedness for mass casualty incidents. This study will improve Emergency Medical Services and enhance the quality of services for planning and responding to mass-casualty incidents (MCIs). Thus, this study aimed to assess the level of disaster preparedness in selected public hospitals for MCIs in Amhara Regional State, Northwest Ethiopia.

Methods: A descriptive cross-sectional study was conducted at general and comprehensive specialized hospitals (CSHs) in the Amhara Regional State, Ethiopia, using a World Health Organization (WHO) hospital emergency response checklist that included a domain on mass-casualty management (MCM) adapted from a literature review.

Results: Seventeen (17) hospitals were evaluated (response rate, 81%). Five (29.4%) were teaching hospitals (tertiary healthcare) and 12 (70.5%) were non-teaching (secondary healthcare) hospitals. With an average mean of 97.3 (SD = 33.68; range 31-160), most hospitals under the WHO required an acceptable level of preparedness. Two were at an Unacceptable (0-67) level of preparedness, 12 (70.5%) hospitals were in an Insufficient (68-134) state, and the other three had an Acceptable (135-192) level of preparedness. The study also found that most hospitals lacked a mass-casualty triage strategy that adhered to internationally accepted principles, guidelines, and contingency sites for MCI management. Furthermore, surge capacity, human resources, logistics and supply management, safety and security measures, and post-disaster recovery planning have been found to be insufficient.

Conclusion: The preparedness level of hospitals is insufficient for potential MCIs in this region and requires prior attention when implementing existing strategic guidelines to develop and activate hospital disaster plans when needed. The main key components were Insufficient, such as command and control, safety and security, post-disaster recovery, and MCM. Immediate actions are needed to improve a region's response to large-scale disasters. The top priorities include developing comprehensive triage strategies, surge capacity, and safety measures. Standardized incident management systems and staff preparedness must also be improved. Healthcare institutions should prioritize training, protocols, and communication to prepare better for future disasters.

Engaging Communities for Prevention of Climate Sensitive Disease Outbreaks: A Sri Lankan Experience

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Keywords: ***Climate Change, Community Engagement, Dengue Prevention***

Abstract

Dengue fever is a disease of public health concern with considerable morbidity and mortality in Sri Lanka. Two dengue peaks are observed during the year, corresponding with monsoon seasons in the country. However, during the last decade, magnitude and frequency of dengue outbreaks have increased, owing to abrupt weather changes and extreme weather events. With the impact of climate change such deviations have become a norm, rendering traditional preventative and control strategies obsolete. Hence, a novel community engagement programme was envisioned to empower at-risk communities on dengue prevention. The objectives were to empower communities to eliminate dengue mosquito breeding sites, educate on the importance of sustained preventative actions and inculcate good practices to prevent mosquito bites. Programme was implemented across 12 districts vulnerable to both climate and dengue risks. Sarvodaya, Sri Lanka's largest community-based organization, together with the National Dengue Control Unit (NDCU) and World Health Organization (WHO), selected and trained grassroots community leaders on the essentials of dengue prevention and community engagement across all 12 districts. In turn, these leaders formed community health circles at the grassroots level, to mobilize communities for action. NDCU provided technical supervision, while WHO assisted with logistics and coordination. A special dengue prevention and control week was declared in June 2022 where public health teams along with members of the community health circles visited almost 900 households, reaching 35,000 individuals. Identified dengue mosquito breeding places were eliminated and high-risk groups were educated through community meetings. Following the programme, a nearly 60% reduction in hospital admissions was observed in the intervention districts. No major outbreaks requiring national-level intervention were recorded from intervention districts. Although the impact of climate change on dengue has increased, through engaging and empowering at-risk communities, such impacts can be mitigated saving lives in a resource-poor setting.

Comparison of Key Nursing Human Resource Management Factors in General Hospitals and Geriatric Hospitals for Post-Infectious Disease Disaster Response

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Abstract

Recently, the importance of nursing staffs have been emphasized due to the experience of infectious disease disasters. Many nursing staffs faced difficulties due to inadequate preparation and response in crucial human resource management during infectious disease disaster responses. To prevent this and to prepare for post-pandemic situations, we aim to identify and compare the key nursing-human-resource-management factors in different types of general hospitals and geriatric hospitals. In this study, we conducted reviewed literature resources, interviews, and utilized the Analytic Hierarchy Process (AHP) targeting experts. Our goal is to proactively manage the prioritised key factors from the beginning and prepare for infectious disease disasters in advance through this approach. For the AHP, a survey consisting of four categories: (1) staffing support and protection, (2) workforce capacity enhancement, (3) staffing acquisition and reallocation, and (4) governance, along with 30 corresponding factors, was conducted with 24 nursing managers from general hospitals and geriatric hospitals. The results showed that both groups ranked 'nurse-to-patient ratio' as the top factor. However, differences were observed in other factors. Particularly, in the case of 'number of nurses capable of operating specialized equipment for critically ill patients,' geriatric hospitals ranked lower compared to general hospitals. Therefore, we propose establishing nursing human resource management preparedness plans and strategies that can effectively respond to infectious disease disasters by early detection of crises in nursing human resource management through a monitoring system based on key factors.

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Development of a HRM Warning System Based on BCMS for Healthcare Institutions: Focusing on Pandemics

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Keywords: ***Business Continuity, Human Resource Management, Organisational Resilience, Warning System***

Abstract

As the importance of disaster management is emphasised, many companies operate business continuity management systems (BCMS) to maintain the organisation's core functions even in the event of a disaster. Since the COVID-19 pandemic, healthcare institutions have also seen increased interest in BCMS. This is because increased medical demand and staff infection due to large-scale spread and long-term response threatened the business continuity (BC) of healthcare institutions. Since compared to other risks, human resource management (HRM) is particularly important in order to the BC of healthcare institutions in a pandemic, a warning system that can quickly respond to manpower loss must be combined with BCMS for management in an integrated manner. Therefore, in this study, the literature reviews on BCMS and the case analysis through interviews with managers of 11 healthcare institutions were conducted. And then using the key concepts of BCMS, the elements of the warning system were configured and the logic was developed. As a result of the study, the BC warning system consisted of four stages. Stage 1 is to prepare and check the plan before damage due to risk occurs. Stage 2 is to response to manpower loss by adjusting work to the minimum business continuity level (MBCO) in BCMS. Stage 3 is a crisis stage in which the scale of damage increases compared to Stage 2, so to response by adjusting the work to a minimum of core functions. If the scale of damage expands beyond the manpower required to maintain the organisation's core functions, stage 4 as emergency situation was declared. Through this warning system, the healthcare institutions can decide at what point to prevent an emergency situation by applying strategies such as recruiting personnel or requesting external support. This warning system combined with BCMS is expected to contribute to increasing organisational resilience to pandemics.

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A Machine Learning Approach to Predict Healthcare Workers' Stress Using Wearable Device Data During the Covid-19

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Keywords: ***Healthcare Workers, Machine Learning, Wearable Device, Work-Related Stress***

Abstract

Healthcare workers are vulnerable to stress in infectious disease situations, facing numerous occupational risks. This stress can escalate to burnout, which, in turn, adversely affects both patients and healthcare systems. This study aimed to develop an algorithm by constructing a machine learning (ML) regression model to predict the stress among healthcare workers. Real-time data were collected from 108 healthcare workers using smartwatches between October 2022 and January 2023. A total of 713,881 bio-signals were extracted from smartwatches, consisting of body temperature (BT), heart rate (HR), heart rate variability, SpO2, systolic/diastolic blood pressure (SBP/DBP), respiration rate (RR) and step count information. Additionally, a total of 1,712 daily records of subjective stress levels per event were also obtained. Seven machine learning (ML) algorithms were implemented to evaluate a stress prediction model developed using these biophysical data and daily records. These algorithms included Extra Trees, Random Forest, Extreme Gradient Boosting, Gradient Boosting, Decision Tree, Linear Regression, and Ridge Regression. The ratio of the training and test dataset was 3:1. As a result of evaluating the stress pr Therefore, it is crucial to proactively identify healthcare workers' stress levels and provide support to mitigate it, preventing it from progressing to burnout, ultimately leading to higher state of resilience.

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Is Resilience Useful, Usable, and Used? Outlining the Social Characteristics of a Resilient System

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Abstract

The COVID-19 pandemic has underlined the international priority to systemically operationalise resilience in the face of increasing prevalence of complex and cascading hazards. This concept study identifies the components of a resilient society, establishing the usefulness and usability of the application of 'resilience', and proposes the characteristics used by a resilient system. Through the review of case-based examples and previously published concept studies, the study aims to provide a concept analysis to understand and qualify the characteristics of a resilient society. Through extensive theoretical research, and critical analysis of disaster risk responses, practical applications of guiding policy on international and governmental levels both effective and not, the authors condensed the literature to identify the key components of a resilient society or system. To respond to this evolving landscape of disaster risk, community and governmental responses should be collaborative in order to be successful and sustainable to increase resilience across communities, societies and networks. To unpick the complexity of how communities and governments might promote resilience effectively, we explore whether community and organisational social capital are useful resources to create and sustain resilient approaches to disaster risk reduction and management. We consider that by exploring how social capital links, bridges and bonds actors within a system are qualitative key facets of a resilient community. A resilient system is the product of trust and collaboration between asset-based networks of bonded and bridged communities and risk and support-based networks of bonded and bridged organisations. To ensure the concept of resilience is used, networks of bonded and bridged communities need to be linked with networks of bonded and bridged organisations. By evaluating the usefulness and usability of the concept, we consider that a resilient system is an iterative learning process, asset based, trusting across power and resource gradients and is best built before or even if essential during a crisis. Noting that resilience is a dynamic process which requires integrated collaboration and continual adjustment to develop a sustainable framework, we consider that social characteristics of a resilient system are useful, useable and should be used.

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