CARE-RISK
UK-MALAYSIA PARTNERSHIP

Book of Abstracts

CARE-RISK: UK- Malaysia partnership
(**CA**pacity building to **RE**duce disaster **RISK** in the UK and Malaysia)

Universiti Teknologi Malaysia Kuala Lumpur, Malaysia
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CAPACITY BUILDING TO REDUCE DISASTER RISK IN THE UK AND MALAYSIA

CARE-RISK: UK- Malaysia Partnership

Book of Abstracts

Edited by

Dr Udayangani Kulatunga, Dr Siti Uzairian Mohd Tobi and Dr BinguIngirige

February 2015

Dr Udayangani Kulatunga, Dr Siti Uzairian Mohd Tobi and Dr BinguIngirige*(edited by)*
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Preface

Capacity building has been identified as a central strategy in the UK and in Malaysia as a mechanism to respond to disasters. CARE-RISK: UK- Malaysia Partnership utilises the principle of capacity building as a way of improving resilience of targeted groups for better disaster prevention, preparedness and response. The workshop provides a unique opportunity for early career researchers from Malaysia and the UK to develop a sustained long-term research network for capacity building for disaster risk reduction. The workshop will explore the current research needs, gaps, challenges and opportunities with particular reference to the local capacity building for disaster risk reduction. The workshop consists of key-note speeches, group discussions, poster presentations, networking activities, and academic and research skills development activities.

The book of abstracts is a summary record of the research work that has been carried out by the workshop participants. We hope that participants will obtain useful feedback to their current research work, ideas, gain insights from the work of others and forge connections that will endure into productive joint activity after this event. Further, we hope that you will find the workshop interesting and valuable for your careers

Dr Udayangani Kulatunga

Workshop coordinator- UK

Dr Siti Uzairian Mohd Tobi

Workshop coordinator- Malaysia

Acknowledgements

As the coordinators of the CARE-RISK: UK- Malaysia partnership, we are delighted to have the opportunity to organise this workshop.

Our thanks go to the members of the British Council Researcher Links team in the UK and in Malaysia for their timely responses for all our queries. Without the input of all of them, the workshop could not have happened and we are enormously grateful for their support.

Professor, HishamElkadi and David Baldry from School of the Built Environment, University of Salford, UK and Prof. Awaluddin Mohamed Shaharoun, Dean, UTM Razak School of Engineering and Advanced Technology provided unwavering backing and encouragement for the success of this workshop.

We also thank the guest speakers Dr. HariyatiShahrima Abdul Majid (MERCY Malaysia), Dr. Zuhairi (CIDB), Mr Nate (RedCross Malaysia) and Tuan Mohd AriffBaharom (National Disaster Control Centre) for their willingness to stimulate invaluable discussions and debate around the workshop theme.

We are also grateful for Professor Mohan Kumaraswamy for agreeing to publish a special issue in the Built Environment Project and Asset Management from the workshop participants.

We would like to extend our appreciation to Hayat Ezri for providing valuable support for the workshop organising activities.

Further, we would particularly like to acknowledge the support of our mentors Prof Christopher Preece, Assoc. Prof. Abdul Rahman, Prof Ormerod and Dr Ingirige for their continuous support in organising the workshop and their invaluable guidance.

Finally, we would like to thank all the participants from Malaysia and the UK for their valuable contributions made towards the workshop in making it a success. If not for their contributions, the workshop would not be successful.

Dr Udayangani Kulatunga, Dr Siti Uzairian Mohd Tobi

Coordinators CARE-RISK: UK Malaysia partnership

Workshop Organisation

Organised by
School of the Built Environment, University of Salford, UK
School of Engineering and Advanced Technology, Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia

Funded by
The Researcher Links Programme, The British Council, UK

Message from the Head, School of the Built Environment, University of Salford, UK

The Care-Risk Workshop is timely with the increasingly ecological and societal challenges that face many urban environments. Currently, the proposed cultural, socio-economic and technical transformative solutions to improve resilience in cities seem to be too little too late for a large number of metropolises in the face of more intensive and more frequent natural aggressions. In time of uncertainties, we are challenged to maintain the fit between existing internal structures and external realities; of how the externalities of social and ecological challenges would shift our false sense of securities in our cities resilient capabilities. Climate change, for example, will soon reach a point in many cities where the average coldest year would be hotter than any year of the last 40 years. The scientific journal *Nature* projected that the earth, overall, passes climate departure in 2047.

Regeneration of many cities is essential to enable their sustainable re-development and more importantly to maintain their resilience and their continuity. Many cities face major ecological challenges that require immediate intervention for their future survival. In the last five years, resilience tends to replace sustainability in every urban design, planning, and socio-economic studies of cities. Guria, the OECD Secretary, explained in 2013 that the two major challenges facing contemporary cities are inclusiveness and resilience; the Care-Risk workshop addresses both. The concept of the ability of cities to bounce back from adversities and/or natural disasters has captured the imagination of planners and designers. Disaster management and preparedness and response to these challenges are key to maintain the viability of the threatened urban environments.

The Centre for Disaster Resilience (CDR) at the University of Salford is one of the global leader research centres in this field. CDR continues to examine, anticipate, and promote innovative ideas and theories to support building resilience in many urban environments around the World. I am delighted to see CDR taking the lead with the Universiti Teknologi Malaysia, with the support of the British Council, in building capacity for future leaders and thinkers in questioning our mental abilities to change our internal structures to suit ever more visible destructive externalities. I am certain that the Workshop will provide a milestone for more innovative and creative knowledge to further protect our communities and our places.

Professor HishamElkadi
Head of School of the Built Environment
The University of Salford, Manchester
United Kingdom

Message from the Dean, Universiti Teknologi Malaysia

In the name of Allah, the Most Beneficent, the Most Merciful,

On behalf of Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia, I would like to warmly welcome you to this Workshop which has been kindly sponsored by the British Council, in association with UTM and involving several universities from the UK and Malaysia.

The aim of this Workshop is to bring together postdoctoral researchers who are setting out on their academic careers and focuses on the timely topic of capacity building for disaster risk reduction.

Disaster management and emergency planning has been evolving as a serious academic and research discipline for some time. In 2014 Malaysia was faced with several tragic events of regional and global significance and recently has been faced with serious flooding which has resulted in large scale devastation.

This Workshop is an opportunity to engage some of the brightest and dynamic young brains in coming up with ideas for potential international collaborative research which should have local, regional and global significance. It is hoped, the outcome for this meeting of minds will result in a few high quality and relevant topics for research.

I would like to thank the sponsored and organisers of this unique event for their hard-work and dedication and wish all delegates every success.

Prof. Dr. Awaluddin Bin Mohamed Shaharoun
Dean,
UTM Razak School of Engineering and Advanced Technology
Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia

Message from the British Council Researcher Links Programme

Researcher Links was launched in 2013 with the aim to give early career researchers across 20 countries the opportunity to form international connections through fully funded workshops and travel grants. Since the launch, thousands of researchers from across the various countries have benefited from Researcher Links. New international collaborations, networks and projects have already been formed directly from the first round of workshops.

In 2014 Researcher Links has continued in its original form and has also been included in the Newton Fund, with new partner countries. Over 600 applications were received in 2014, and new calls under the Newton Fund will be announced in 2015.

The British Council Researcher Links workshop in Malaysia will provide opportunities for early career researchers to interact, learn from each other and explore opportunities for building long-lasting research collaborations in the area of capacity building for disaster management. We hope that the workshop will be a fruitful experience for all.

Special Issue of Journal

CALL FOR PAPERS

Built Environment Project and Asset Management

Special Issue on: CAPACITY BUILDING FOR DISASTER RISK REDUCTION

An increasing number of devastating natural disasters have occurred during the recent years. Climate change is set to worsen their incidence and impacts even further making the risk of disasters a global concern. The increased extent and intensity of disasters has resulted in higher numbers of mortalities, social problems and economic losses. The growing complexity of disasters in terms of their diversity, magnitude, frequency and uncertainty requires, even the countries previously considered not being at high risk from disasters, to re-evaluate and strengthen their risk reduction strategies and capacities. Disaster risk reduction strategies aim to avoid (prevention) or limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development (UNISDR, 2004).

Disaster risk reduction strategies can be hazard-specific, sector-specific or commonly applicable across different types of disasters and involve multi-sectorial disciplines regardless of their nature and scale. Amongst them, capacity building has been widely accepted as a disaster risk reduction strategy that builds the resilience of targeted groups for better prevention, develops the preparedness and response strategies against disasters which can be focused at institutional, community and individual levels. Capacity building for disaster risk reduction sits at the interface of policymaking, engineering and scientific research due to the interdependencies and cascading impacts of disasters and calls a close and continuous exchange within these disciplines in order to provide effective and long-term solutions (UNISDR, 2013).

Given the increasing imperatives for the above, the Built Environment Project and Asset Management journal (BEPAM) will publish a themed special issue that focuses on multiple dimensions of capacity building for disaster risk reduction.

Selected topics within the scope of the special issue include, but are not limited to the following themes / areas related to capacity building for disaster risk reduction.

- Micro and macro-economic factors
- Development of skills and knowledge
- Protection of built environment assets
- Practical frameworks and tools
- Community based disaster risk reduction
- Critical infrastructure protection and disaster risk reduction
- Legislative and policy initiatives for disaster risk reduction
- Culture and disaster risk reduction

High quality original papers are invited within the “capacity building for disaster risk reduction” special issue theme. All papers will be subjected to the journal’s double-blind peer review process.

Submission guidelines:

Author guidelines must be strictly followed and can be found on the journal web site at:
http://www.emeraldgrouppublishing.com/products/journals/author_guidelines.htm?id=bepam

Authors should submit directly to the special issue through the ScholarOne Manuscript system at http://mc.manuscriptcentral.com/bepam

To ensure that all manuscripts are correctly identified for review for this special issue, authors should please select 'Special Issue on Capacity Building for Disaster Risk Reduction' when you reach the "Article Type" step in the submission process.

Submitted articles must not have been previously published, nor should they be submitted for consideration for publication elsewhere, while under review for this journal.

Further information about BEPAM is available at
www.emeraldgrouppublishing.com/BEPAM.htm

The Guest Editors will conduct an initial review of submitted papers. Those judged suitable for the special issue will be sent to at least two independent referees for double blind peer review, after which submissions may be recommended for revisions and further review, acceptance or rejection.

Overall Timescale:

Manuscripts must be submitted for review through the ScholarOne Manuscript system as above, on or before 22nd May 2015.

Accepted papers – i.e. accepted after reviews as above will be published in a BEPAM special issue targeted for about mid-2016.

We look forward to receiving your manuscript.

Dr Udayangani Kulatunga and Dr BingunathIngirige
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Guest Editors of the Special Issue

Abstracts

Empowering Social Resilience: To Bend Not Break

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Abstract

Different parts of the world have been affected by a variety of natural hazards and man-made disasters over the past three decades resulting in catastrophic impact on human wellbeing. The 2004 tsunami is an extreme case where, after almost a decade, the affected countries are yet to be completely recovered. Apart from the tsunami and other natural hazards, many countries are also affected by a long running civil war that results in random devastating attacks on human lives and property. Therefore, a clear understanding of disasters is becoming extremely important to people's lives with the increasing frequency and magnitude of hazards. Although most of these calamities are unavoidable, many of their tragic results can be significantly mitigated. People that become vulnerable to these disasters seek to be physically and psychologically comfortable and safe. Communities need to build their capacity to adapt to consequences of disaster and face the reality without losing critical social relationships, economic options and political stability.

All catastrophes have severe negative impact on community wellbeing. Social resilience is the ability of human communities to withstand and recover from stress, such as environmental change or social, economic or political upheaval. The principles and practices of 'resilience' (e.g. control, coherence, and connectedness) have been widely applied to ecological systems. The importance of extending them in to social systems is an absolute necessity. Having identified the adverse consequences of disasters, this research proposes to investigate and enhance means for improving social resilience to withstand disasters, through capacity building in developing countries.

Keywords: Disaster management, Social resilience, Capacity building, Developing countries

Disasters and Building Social Resilience

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Abstract

This paper/presentation based on the South Asian experience of how children and their rights are protected and practiced in the context of disasters, offers possible ways for social work practice and building social resiliency against disasters in the Asian countries. Disasters around the world disrupted the lives of millions of people, especially pushing many children in to armed conflict, prostitution, drug trafficking and other dangerous occupations resulting in violation of their rights. At the same time, approaches to disaster management continue to be largely technology centered, top down and isolated from human development processes. Children are the most photographed but least consulted, while making disaster management policies and programs.

The research for this paper was based on an earlier research conducted in Tsunami 2004 (India and Sri Lanka), and floods of 2004 in Tarai Nepal and the 2011 earthquake in Sikkim (India) and Nepal. A desk research and focus group discussions were carried out with children and members of Child Clubs involved and affected by disasters. Children rights perspectives were often talked about but seldom implemented. The families are also become vulnerable in the event of disasters making children further vulnerable to external shocks and threats. The rescue- relief-rehabilitation model of interventions resulted in treating children and families as passive beneficiaries and not as actors in the disaster management. The current models of disaster management largely failed in paying attention to the special needs and rights of the children and families. This paper also address the question that why some families are able to cope up during post disaster time compared to other families in the same community or village?

The field evidence from the South Asia study shows that only few nongovernmental organisations (especially Child rights based) are able to implement post disaster recovery activities from the view point of Children needs and rights. The role of professional social workers found lacking or limited. (315 words)

Keywords: Children, disasters, social work, coping, resiliency, south Asia

Application of Integrated Flood Analysis System (IFAS) for Flood Forecasting at Dungun and Kelantan River Basin

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Abstract

Flooding is the most frequent natural hazard that happened in Malaysia which caused great economic losses in term of properties, crops and even deaths. In recent years, rapid development within river catchment has resulted in an increase in the flood frequency and magnitude. Developments of a flood forecasting & warning system is highly expected as a quick and efficient means to reduce the flood disaster and minimize human damage. In this study, Integrated Flood Analysis System (IFAS) was used to forecast the flood by using ground and satellite-based rainfall. Topography, land use and satellite-based rainfall data can be obtained automatically in IFAS for flood forecasting. The simulated discharge is used to generate the flood inundation map within the catchment area for selected flood events by using hydrodynamic model known as Infowork RS. Kelantan and Dungun river basin are chosen as the study area due to the extreme rainfall intensity in both areas. The simulated discharges produced by IFAS for all events were compared to the observed discharges. According to the results, IFAS software is able to mimic the shape of the observed hydrograph. However, it is noticed that the satellite rainfall data was always overestimated the discharges compared to ground-based rainfall. This phenomenon is inherent as the satellite-based rainfall data obtained in the upper atmosphere which represent the overall catchment rainfall while the ground-based rainfall representing the point rainfall where the station located. The inundation location of flood simulated by Infowork RS was close to the observed flood inundation map. The results have proved that IFAS was able to predict and analyse the time and scale of flood accurately, even for insufficiently gauged river basins.

Keywords: Disaster, Flood forecasting, IFAS, Inundation, River basin

Systemic Risk and Moral Hazard: When Are Bailouts of Financial Institutions (Un) necessary?

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Abstract

This research focuses on risk management and business continuity of financial institutions in the context of distress (i.e. "financial disaster"). Its main objective is to support quick decisions of policy-makers, regulators and supervisors (e.g. government and central banks) when a financial institution is in distress and needs public resources (e.g. bailouts). The question is to be answered is: should that particular financial institution be rescued or not?

This is not a trivial question as any answer has potential negative consequences. Although the assistance of a lender of last resort, LOLR (usually central banks, governments or international organisations) is seen as necessary to prevent the spread of the failure of an institution to the whole economy (i.e. "systemic risk"), such financial support reduces the incentive of financial institutions to avoid risk which, in turn, increases the chances of future financial crises (this careless behaviour is known as "moral hazard").

So, there is a trade-off between the short-term benefits of a LOLR's assistance and its potentially negative consequences in the long run. This study aims at proposing quantitative measures that indicate when the failure of a financial institution in distress is likely to affect other institutions. Thus, the suggested indicators will signal if a particular institution should be bailed out despite the potential damage regarding more exposed institutions in the future.

The first contribution of this research refers to the focus on the decision about the possibility of bailing out financial institutions instead of simply measuring the impact of the failure of a bank on the possibility of failure of other institutions (as usually done in the literature).

The second contribution will be the application of novel quantitative methods to measure the impact of the bankruptcy of a financial institution on the probability of failure of other institutions. These methods are Copula Theory, Lead-Lag Analyses and extensions of Network Analyses.

The project is at an initial stage and other approaches (quantitative or qualitative) used by researchers in the area of disaster management may contribute to future improvements and result in multidisciplinary projects.

Keywords: Bailouts, financial institutions, systemic risk, moral hazard

Assembling Social Housing and Climate Adaptation

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Abstract

With the intensifying recoupling of environmental and political events in both public and private sectors, concepts of sustainability, emergency, development and resilience have offered institutional reassurances and continue to shape adaptation policy, research and disaster response technology in a variety of sectors and cultural milieus. Despite critiques of different interpretations and deployments of these ideas, alternative trajectories and historical continuities of inequality and social justice in the built and changing environment are seldom pursued concretely. The social housing sector, which comprises nearly 4 million properties UK-wide provides one such avenue.

Disaster is not an event, but a process whose conditions require the lengthening of analysis and relinking to the relevant physical and political economic drivers. The UK's social housing and the Climate Change are linked by a common origination process - human induced climate change is a consequence of the same fossil-fuelled industrialisation which produced the urban squalor of Victorian Britain to which social housing was a response.

This poster depicts an assemblage-orientated framework for understanding social housing and climate adaptation, in which humans and non-humans, like buildings, policies and facts, as well as their interrelationships are considered interactively. It draws on a case study and toolkit developed as part of a Technology Strategy Board Design for Future Climate Competition. In producing an adaptation management strategy for a London-based social housing organisation with 4000 properties in London a range of transferable stock profiling and prioritisation techniques were developed.

Property-based surveys and modelling also revealed specific and practical building policy contradictions between carbon reduction and adaptation concerns. The idea of schizophrenic buildings was developed to describe how climate policies intended to mitigate carbon emissions have increased overheating risks. Tools created for this purpose were extended to create citizen science methods and analytics for identifying climate risks in their local built environments; they may also be applied to any organisation with significant building stocks.

The poster forms part of ongoing research exploring the politics and the practicalities of current and future imaginings of socio-ecological welfare and tenure. To this end different kinds of disaster originations and responses are instructive.

Keywords: Built Environment, Assemblage, Social Housing, Schitzophrenic Buildings

Disaster and Climate Resilience of Industrialised Building Systems (IBS)

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Abstract

Industrialised Building Systems (IBS) is the term used to represent the prefabrication and construction industrialisation concept in Malaysia. It is a construction technique in which components are manufactured in a controlled environment, transported, positioned and assembled into a structure with minimal additional site works. The concept has been introduced as a method for delivering affordable housing and to answer key problems in the Malaysian construction industry such as reliance on foreign labour, high wastage. The Malaysian government through its IBS roadmap seeks to increase the use of IBS in Malaysia to over 70% IBS content for public sector building projects and over 50% for private sector building projects. However, adaptation of IBS contents to climate change impacts remains an issue that is little considered and explored yet. Therefore, further research is required to investigate how IBS in use in Malaysia can be adapted to changing climatic conditions; the resultant average weather conditions and extreme weather events/natural disasters. The proposed research seeks to bring together two distinct key strategic policy priorities of Malaysia; increasing the use of IBS and adapting to climate change, which are currently being addressed in isolation. Given that IBS are widely used in delivering affordable housing schemes, enhanced climate and disaster resilience of houses built using IBS will directly benefit recipients of these houses; people on low and medium income and people living at areas vulnerable to such impacts. Wider IBS adoption will limit reliance on foreign workforce in the Malaysian construction industry. This will gradually eradicate many inherent social and economic issues related to foreign labour. IBS promote sustainability through the use of controlled production environment, minimising waste, and energy efficient building material. A safer work environment for construction workers can be achieved through IBS, which will benefit Malaysian workers contributing to the industry.

Keywords: Climate change adaptation, Disaster risk reduction, IBS

A New Model on Disaster Preparedness

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Abstract

The study investigated the survivors' learning experience from the tsunami in Aceh in 2004. It examined the learning experience of the survivors as reports revealed that the lessons learnt had impacted the people's life socially and economically. Nevertheless, we had missed out things that we should have done during the disaster. Therefore, the need to record the journey people who had gone through the disaster is utmost important. Seven key informants were identified for the study. Additionally, a total of 103 respondents took part in the interviews and 450 participated in the survey. The SWOT analysis was conducted to recognize the unique learning experiences of the survivors.

The findings revealed that preparedness is most significant in reducing loss and damage. There is an urgent and strong need to educate people at risk of natural disaster. In addition, the findings confirms that the six areas, namely their capabilities, their limitations of handling the disaster, the challenges faced in terms of leadership, how resources were effective mobilized, public awareness and education, and community self-reliance are dominant domains in disaster preparedness. Most importantly, the understanding of the learning experience and lessons learnt among the survivors of the tsunami will inform and support those who might face a similar situation. It provides valuable information for them who would have to embark on the same journey if disaster ever strikes again.

Disaster cannot be prevented but preparedness is found to be the key of the most possible strategies. Eventually, a model on disaster preparedness was developed. It is an innovative, comprehensive and sustainable model pertaining to the notion of disaster preparedness. The model is the catalyst to enhance preparedness programs for disaster as it provides the framework towards designing disaster preparedness programs and activities. It serves as the basis for disaster preparedness in curriculum, co-curriculum and community engagement projects.

The paper aims to highlight the new model on disaster preparedness. It is one of the holistic integration of the six domains. The paper elaborates on elements of each domain based on the six areas presented. In sum, the study concludes that the model based on the themes obtained help individuals to enlarge their worldview, transform plans for future disaster management and enhance awareness towards disasters.

Keywords: Disaster, preparedness, tsunami, learning experience and model

Social, Psychological and Economic Impacts of Natural Disasters: Implications for Disaster Management and Risk Reduction

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Abstract

Natural disasters cause extensive losses and damages to human psychological wellbeing, economy and society. Cultural factors such as social values, traditions, and attachment to a location influence disaster relief and response efforts. There is a paucity of research in this area which is of importance to environmental and public agencies globally in helping to reduce disaster risk and aid disaster management. This study represents the first review to highlight the importance of interrelated factors such as cultural background in the assessment of economic effects, vulnerability to the psychological impacts of disasters, disaster preparedness, and provision of disaster services. We underline the importance of cultural competence in the planning and delivery of effective disaster health services. In addition we emphasize the need for disaster risk reduction efforts to address the varying circumstances of people with different cultural backgrounds and the effect on socio-psychological and economic functioning. This project expands our knowledge base in the field of disaster management and provides recommendations for better management and risk reduction in the field.

Keywords: Disaster management and risk, Health, Culture, Economy

Capacity Building of Institutions for Disaster Risk Reduction: Learning From Communities as First Responders

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Abstract

Most communities in humanitarian catastrophes have been experiencing disasters (including human made conflicts and technological hazards) for generations. Through these experiences communities have developed pragmatic mechanisms to deal with uncertainties and dangers produced by disasters. Religions, cultures and traditions have taught communities to effectively deal with the impacts of these uncertainties and dangers as well as develop new knowledge to deal with these issues. When we examine the communities in Africa, Asia and the Middle East the knowledge systems on infrastructure, built environment as well as social reconstruction after disasters are far more cost-effective and efficient than outside interventions.

The current disaster interventions and risk reduction however, do not necessarily take the community knowledge systems into account. Our experiences from Sri Lanka, Pakistan, Sudan and Somalia is that in most disaster interventions, communities do get marginalized and do not receive the opportunity to participate as equal partners of change.

This research is influenced by the previous work of Phil O'Keefe, Sultan Barakat and Barry Musnlow as well as Amartya Sen, Richard Sennett and PonnaWignaraja, who have argued for community centred interventions that are effective and efficient to deal with the uncertainty and dangers of life. This research examines the following three areas as an ongoing programme to understand and develop new knowledge for dealing with disasters:

1. Understanding of community mechanisms to deal with risks presented by disasters.
2. Evaluation of disaster responses that link towards sustainable development.
3. Increasing risks of urbanisation in Asia and Africa.

This research argues that learning between institutions and communities has to be mutual and on equal grounds. Although much has been done on capacity building of communities, no work has been done on institutional capacity building to learn from communities.

Taking a qualitative strand, this research follows the tradition of storytelling from Asia, Africa and the Middle East, where listening and learning from communities is important.

In this research, communities are not treated as monolithic but as knowledgeable, experienced and skilful as well as functioning within power structures, caste and class systems with multiple layers. In a practical sense, this research accesses lived experiences of women, men, youths, children, elderly and people with disabilities to

generate information for learning within specific cultural contexts that could be systematized to create new knowledge to deal with disasters.

Keywords: Communities, capacity building, disasters

Housing Information Modelling for Domestic Refurbishment Projects

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Abstract

Construction clients and communities are persistently seeking to achieve sustainability, maximize value and minimise risk/environmental impacts as sustainability has become a major consideration in the construction industry. In particular, it is essential to refurbish a whole house to achieve the sustainability agenda of 80% CO2 reduction by 2050 as the housing sector accounts for 28% of the total UK CO2 emission.

This research develops a housing information process and model as decision support and appraisal tools. It will integrate both Life cycle assessment (LCA) and whole life cost (WLC) methodologies to measure the environmental and economic impacts of the preferred and affordable refurbishment solutions in housing. This will allow alternative refurbishment options to be generated and assessed as an individual, package and whole-house optimised solution including offsite components, so as to enhance the practicality of housing refurbishment and explain variations in occupant's preference to energy efficiency environmental impacts and cost effectiveness for housing refurbishment in a way that a traditional LCA or WLC does not.

This proposed process and model will show not only how they are linked to the energy efficiency, CO2 emission and cost effectiveness, but also how they may interact to affect occupant's decision-making for homeowners, local authorities, housing related bodies and industrial participants.

In general, Dr Park's research interests lie in whole life appraisal, construction economics, sustainability, value/risk management and new technologies like off-site techniques for the construction sector. He has recently focused on housing refurbishment and sustainability issues in order to improve energy use, the well-being of residents, and reduce environmental and financial impacts on home improvement and refurbishment. Dr Park has a keen interest in a blend of theory and practice; it builds upon his knowledge gained in industry (e.g. combining real and model data, integrating different perspectives into a comprehensive system, using mixed quantitative and qualitative methods, etc.).

Keywords: Housing Refurbishment,Information modelling, Life cycle assessment, Whole life cost.

Towards Geospatializing National Landslide Hazard and Risk: Retrospective and Future Directions

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Abstract

The use of advanced and modern geo-information techniques has revolutionized disaster management cycles for hazard- and risk assessment, risk reduction planning, disaster preparedness, damage assessment and post-disaster analysis at regional, national, and global scales. Despite various multi-institutional efforts in reducing risks, the complete inventory and reliable hazard and risk maps are remained elusive and questionable. The scenarios are prevalent in the context of destructive disasters such as mass-movements or landslides, in a tropical environment. From the global issues, e.g. climate change, to regional and local scales, e.g. deforestation, and environmental degradation, the destructive capacity and frequency of landslides are substantially increased made our life highly vulnerable to natural hazards. Therefore, it is crucial to establish persistent policy, institutional and methodological framework with the support of modern and advanced geospatial data for a comprehensive disaster risk analysis and assessment.

This research provides a better insight into the use of multi-sources of geo-information for mapping and assessing landslide hazard and possible risk in Malaysia. An overview of modern spatial data for landslide susceptibility, hazard, and vulnerabilities and risk assessment will be presented. It critically discusses the past, current status and challenges and future directions of modern geospatial industry particularly dealing with mapping, monitoring and modelling of geological hazard. The retrospective and future directions of geo-information and earth observation tools are highlighted for developing and managing the effective strategies and integrated approaches towards preparing more resilient community. The emergence of geospatial technology has improved our ability to evaluate the landslide hazard assessment, model the hazard process, analyse the vulnerability and risk for understanding the landslide geomorphology in a changing environment.

This study put forth the critical and practical framework ranging from landslide inventory to landslide risk assessment as an attempt to support methodological development in Malaysia. Given the continuous national project on multi-hazard and risk assessment, a review is given of the trends in utilizing active remote sensing specifically topographic laser scanning system for developing a comprehensive landslide inventory and generating a plethora of spatial data required for landslide hazard and risk evaluation. The state-of-the-art and advancement of multistage processing sequence based on satellite-, airborne-, and ground-based remote sensing technology coupled with the satellite positioning system, advanced geographical information system (GIS) and expert knowledge promise a better understanding of the earth systems and processes and their dynamics in time and space.

Keywords: Geospatial technology; disaster risk; tropical landslides; Malaysia

Multi-stakeholders and multi-hazards approach to a resilient and sustainable built environment

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Abstract

Recent disasters in cities across the world have highlighted the fragility of built environments and increased concerns about the resilience of cities. It is therefore important for the numerous stakeholders involved with the construction industry to take some responsibility for integrating Disaster Risk Reduction activities into the planning, (re)design, construction and operation of the built environment, thus increasing resilience of the built environment. It is fundamentally important to understand which stakeholders should be involved and when their inputs should are needed. My research looks at the role of key stakeholders in the integration of DRR activities into the urban design and planning process and demonstrates that there is a general lack of consensus regarding the roles of stakeholders and their levels of participation. In order to increase capacity building, there is a need to engage a wider range of stakeholders and ensure interaction among them, as well as to enhance their understanding of multi-hazard approach.

Another area of my research is concerned with the issue that while 'sustainability' does not appear to be a cross-cutting theme in the majority of research on resilience and DRR, many aspects of sustainability play a role within these discussions, particularly with relation to the built environment. Whilst being one of the largest CO_2 emissions contributors, buildings are vulnerable to the effects of climate change (as highlighted by recent Thames flooding and summertime overheating in 2013). These issues emphasise the increasing importance of reducing its negative contributions to climate change and simultaneously in adapting to the risks posed by climate change by increasing resilience and investing in DRR measures. However, while sustainability and resilience are widely discussed, it is not always clear to what extent these concepts are interrelated (if at all). Central to this research is the idea of the 'turquoise' agenda (Perelman, 2008), which suggests that resilience (the blue agenda) and sustainability (the green agenda) – which are currently handled separately- should be synergised.

Keywords: DRR, resilience, built environment, sustainability, stakeholders' engagement

Variables Explaining Organizational Resilience Potential

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Abstract

Resilience, including organizational resilience needs to be understood not as an outcome but as a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance. Adaptive capacities include developing plans and behaviours to address organizational vulnerabilities. There are questions as to whether a causal relationship exists between disaster planning and effective post-disaster adaptive behaviours in crisis. Traditional planning has viewed the disaster plan as an outcome of a process to be utilized in a step-by-step fashion during a disaster. This research critically analyses this view and suggests an alternative strategy, one that focuses on creating organizational structures and processes for Organizational Resilience Potential (ORP). The broad objective of this research is to measure latent resilience, the prevalence of Summated Continuity of Operation Planning (S_COOP) and to test the validity of five hypotheses developed based on theoretical and conceptual framework. An analysis into the variables explaining Summated ORP (S_ORP) is conducted to examine the strength and direction of the relationships. An organizational resilience potential scale was constructed based on factors proposed by Larry Mallak and high reliability organizations theory. A questionnaire was developed and 450 Environmental Health and Safety professionals in Malaysian organizations participated in the survey. Structural Equation Modelling (SEM) was used to determine overall model fitness with Chi=795.213, p=0.00, df=371, CFI=0.934, RMSEA=0.050. Based on structural model regression weights estimate data, five alternative hypotheses were accepted, including all observable variables in the model are related to S_ORP, S_ORP observable variables are related to S_ORP, S_COOP observable variables are related to S_COOP, Variables Correlated to S_ORP (VC_S_ORP) observable variables are correlated to VC_S_ORP, S_COOP is related to S_ORP and S_COOP is related VC_S_ORP. Further to this, 10 out of 12 S-ORP observable variables are positively correlated to S_ORP. This research puts forth convincing arguments on the importance of nurturing adaptive post-disaster behaviours to reduce organizational vulnerability and enable flexibility in disaster management.

Keywords: Resilience, Resilience Potential, Vulnerability, Post-Disaster Adaptive Behaviours

Light Weight Radiation Shielding Material for Nuclear Disaster Management

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Abstract

Radiation contamination is the major negative effect of nuclear disaster which has been terribly observed in recent Fukushima case. In such catastrophe, total estimated financial loss is 250 to 500 billion USD apart from human life. This adverse effect has been accelerating horribly when radiation contaminated water. This leads to scarce of drinking as well as daily usage water for mass people. Hence, finally creates massive public disorder leading to national catastrophe and international biohazard. Currently, only available material to cover radiation emission is lead. However, lead function as a radiation blocking material with its heavy mass instead of radiation absorption. Moreover, lead is a heavy metal and not suitable for water treatment. In order to risk mitigation with disaster management, a light weight filter material is severely needed which is capable of absorbing such radiation. Therefore, the aim of the proposed research would be developing a novel light weight alloy which is capable of absorbing nuclear radiation. For initial studies, Gadolinium will be used as base metal for developing new alloy towards nano porous filtration. Caesium 137 will be used as radiation source in laboratory experiments to mimic Fukushima nuclear power plant model. Fresh water will be contaminated through radiation from the source Caesium 137. Radiation contaminated water will be pass through nano porous filter comprising proposed novel Gadolinium based alloy. Radiation contamination will be measured through Geiger-Mueller Counter for performance evaluation since it is the appropriate counting device for radiation induced events. It is expected that such research would greatly helpful for safe usage of nuclear technology in future alongside with solution for controlling sudden nuclear disaster.

Keywords: Nuclear Disaster, Gadolinium, radiation protection.

Role of construction management in disaster preparedness – An Indian perspective

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Abstract

Disasters are a serious disruption of the functioning of a community or a society which exceed the ability of the affected community or society to cope up using existing resources. Disasters usually interrupt the basic needs of our daily life and badly affect the health, social life, built infrastructure and economic condition of the country and have long-lasting impact if there is no preparedness and post disasters relief activities not properly planned; for examples hurricane Hugo in the year 1989, unnatural floods in Mozambique 2001, the Tsunami in 2004, earthquakes in Bam, Haiti and Gujrat in India. The report prepared by World Bank and Asian Development Bank identified lack of awareness and preparedness for post disaster rehabilitation programmes in India, not just in Gujrat earthquake but coastal Andhra Pradesh and floods in Uttarakhand and Bihar in north India. The destruction around the world proved that there are no 'safe heavens' in the world and made the researchers to review the existing body of knowledge related to disaster preparedness and resilient built environment as a matter of national importance and relevance. Despite the fact that the post disaster recovery has been a significant body of research during the recent past, the role of educating construction management professionals in constructing resilient structures, disaster preparedness of future rehabilitation and facilities management has not matched up with research in many cases . The proposed research is trying to address the issue of risk preparedness from Indian perspective. Initial literature review on the risk management strategies adopted by various stakeholder agencies revealed that knowledge and awareness of integrated approaches is poor.A survey of Indian professionals involved with disaster risk-management activities (i.e. emergency planning, resilient construction, urban planning, and other regulatory bodies as key stakeholders) will be undertaken to develop a framework to enable more effective disasterrisk-management strategies from construction management perspective.

Keywords: Disaster preparedness, management strategies, floods, India, stakeholders.

Risk Management of Fire Following Earthquakes in Urban Buildings

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Abstract

The possibility of fires following earthquakes (FFE) has attracted considerable attention from many researchers for over a decade. For example, in the 1906 San Francisco earthquake and the 1923 Tokyo earthquake, showed that in about 80% of cases, damage was due to the fires following the earthquake rather than the earthquake itself. This phenomenon leads to substantial loss of human life and damage to urban infrastructure and facilities.

There are various factors that can cause fires after an earthquake. Prior to the fire, the active and passive fire resistance system may be damaged by the earthquake. The probability of ignition is high because of toppled furniture, electrical malfunction, movement of hot equipment, and damage to fireproofing systems in buildings such as sprinklers and lifeline. Structures such as arterial roads and bridges damaged due to earthquake resulting in the increased difficulty and considerably more time is needed to extinguish the fire than in the absence of an earthquake. This time may increase if the rescue of those trapped under rubble takes priority. This may pose a serious threat to the structural integrity of buildings, and be detrimental to the life safety of the occupants and rescue workers.

In the context of structural engineering, the earthquake impact and fire design of a building are defined as two different fields, considered to occur separately. Essentially, structure design codes are relevant for designing a structure for an expected level of earthquake and do not consider fire safety. To obtain a well-engineered structure under both earthquake and fire loading requires further understanding in these areas. It is prudent to consider such scenarios in the design of buildings constructed in urban area.

The risk management covers both existing buildings, in terms of retrofit solutions, and those yet to be designed, where a FFE factor is proposed. To ensure the mitigation strategy meets the defined criteria, a minimum time is defined as the safety guaranteed time target where the safety of the inhabitants in a building is guaranteed. Hence, understanding the performance and response of structures in fires following earthquakes is important for risk mitigation purposes.

Keywords: Fire following earthquakes, risk identification, risk assessment, risk management, reinforced concrete structures

Remote Sensing for Disaster Management

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Abstract

Remote sensing is the observation of phenomena from a distance that is, without physical contact with the phenomenon/a being observed. In its most common application, it utilises satellite imagery to observe Earth's surface, thereby negating the requirement to visit a particular location but allowing data to be gathered regarding it. In relation to disaster management, perhaps the chief advantage of remote sensing is the fact that data can be obtained from a dangerous or disaster zone without the requirement of risking personnel on the ground; it is also cheaper than sending in fieldworkers and data can be made available to the relevant authorities in an automated and often more rapid manner. Research to be presented here will focus on the remote sensing of natural hazard phenomena, namely volcanic activity, with three specific aims: 1). to determine those volcanoes most likely to produce disastrous events; 2) to identify those areas in the locale of a volcano which are most vulnerable and 3) to provide some sort of early warning of impending hazardous activity based on long-term observed datasets. Based on data collected from NASA, we have been able to determine the most active volcanoes globally, and patterns in their behaviour, and this has the potential to inform the relevant authorities of the sorts of activity they are to expect in the future. In turn, it is envisaged that having been able to characterise the behaviour of various volcanoes, residents likely to be affected can be educated into tell-tale signs that might indicate impending activity, and early warnings of possible activity might soon be available. The data required to undertake such studies is freely available on the internet and as such, has great potential for assisting less wealthy nations manage the volcanic hazard.

Keywords: Remote sensing, volcanoes, early warning

Climate Change Risk and Mitigation Measures: Water and Building sectors

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Abstract

My main research areas and experience related to disaster management and building capacity include rainfall extremes analysis; this includes analysis of extremes events using Generalised Pareto (GPD) and Generalised Extremes Value (GEV) Distributions. This involves the effect of climate change on rainfall pattern, then urban drainage systems and river modelling can be carried out using these extremes for flood risk assessment. The outcome of this modelling exercise is enabled to identify the potential flood hazard in the flood plain and properties at risk using combination of hydraulic modelling and GIS. Then management can be introduces either policy or infrastructure measures (eg. sustainable urban drainage system, flood defence). This topic normally carried in a wet environment which is expected to be worse with the climate change. The analysis considers different scenarios of greenhouse emission recommended by Intergovernmental Panel on Climate Change which assumes different storey line about future evolution of human activities and socioeconomic growth.

Another area of interest is water quality modelling of groundwater and surface water with climate change. This involve develop a hydrological model based on the ground water aquifer characteristic and river flow properties using point source pollutants concentration from urban drainage system (water quality model) to assess the extends of pollution. Then policy measures can be applied to avoid this risk which would include toxic materials affects the human health.

Furthermore, river flow forecast and impact on dam reservoir operation for purpose of management of irrigation water requirement is another interest. This involve develop a mathematical model for flow, water level and evaporation forecast at reservoir dam using Artificial Neural Network. Then water balance equation with irrigation water requirement downstream of the reservoir can be applied to work out the emptying programme of this reservoir during the irrigation season. The outcome of this will enable to forecast the available water demand for agriculture especially with climate change in arid environment and investigation for potential drought risk.

Creating green buildings is the current project which is aiming to find sustainable solutions to the environmental risk of global warming includes using low and Zero Carbon technologies to reduce the CO2 emission. This include application of renewable energy and energy efficient strategies (water harvesting system, ground source and air source heat pumps, wind turbine, solar panel, Insulation, energy efficient glazing and lighting..etc.). This is done by Building Information and thermal modelling to identify the suitable passive solution.

Keywords: Climate change, drought, flood risk, pollution, sustainable buildings

Developing Societal Resilience to Disasters through an Academic Network

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Abstract

Using knowledge, innovation and education to build a culture of safety and resilience at all levels is one of the priorities for actions identified to achieve substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries. The United Nations Office for Disaster Risk Reduction (UNISDR) insists that disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience. Imparting sufficient disaster knowledge will help people to understand the process of mitigation and the process of recovery following a disaster. As such, making the disaster risk reduction knowledge available to a wider community is vital to achieve societal resilience and sustainable development. This indicates the importance of education in promoting and enabling disaster risk reduction. As such the key to disaster risk reduction is about sharing and using information and knowledge in a productive way through awareness-raising and educational initiatives so that people make informed decisions and take action to ensure their resilience to disasters.

Thus the field of education contributes to increase the public awareness on disaster reduction and to create an impact on the culture of disaster reduction in the long run. However, there is gap exists between the growing recognition of the importance of teaching about disaster risks and actually doing it, mainly due to the slower rate of incorporation of such issues within the educational curricula. This affirms the importance of developing the field of education in such a way so that it contributes to increase disaster resilience. Having realised the essential role higher education plays in increasing knowledge and awareness about disaster risk reduction across all sectors and stakeholders and in turn increasing the disaster resilience, it is vital that the education sector to be developed and promoted to achieve resilience. In this context a network for disaster resilience, called ANDROID (Academic Network for Disaster Resilience to Optimise Educational Development), was formed, that aims at gathering a wide and most advanced set of competencies in the field of disaster resilience in sharing knowledge, discussing methodologies, disseminating good practices and producing and promoting innovation, by bringing together a good mix of stakeholders addressing topics of direct relevance for the EU higher education policy. The network will also raise awareness and promote a common understanding among stakeholders of the importance of disaster resilience education and the essential role of European higher education institutions in improving society's ability to increase disaster resilience. More on the network can be found from http://www.disaster-resilience.net/.

Keywords: Disaster resilience, higher education, ANDROID

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Improving Community Preparedness against Flood through Visualisation Disaster Management Training

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Abstract

It is reported that there are about 1800 rivers in Malaysia with an estimated total length of 38,000km. These rivers serve different purposes to the human and the natural ecosystem. However, they might also be the largest threat to the entire corridor areas that contributes to floodings. Floodings are regular natural events in Malaysia which happen nearly every year during the monsoon season, starting December and ends in January. It affected the most population, area and socio economic of the communities. It is argued that the lack of understanding among communities about floodings and its disaster risk, and a poor level of knowledge about disaster reduction initiatives and preparedness are the important reasons for the annual monsoon flooding may turn into a disaster.

It is understood that readiness for disaster will help reduce casualties and risk of structural damage. Community should be aware, knowledgeable and prepared against flood disaster. Study shows that the most critical element in the set of activities associated with the flood-loss reduction is emergency preparedness and response activity. Flood disaster preparedness through interactive disaster training programme will help the community and rescue team to plan and manage flooding efficiently thus, will reduce the costs in human, social and economic welfare. Current approaches in disseminating information through media or even social media are ineffective to prepare the communities against flood disaster. The communities must be prepared on how to manage a disaster by providing them hands-on-training and situation awareness especially during flooding.

The research will focus on the use of visualisation technology for Disaster Management Training, specifically related with flood disaster. The area of study is related with disaster informatics. Disaster Informatics or crisis informatics is the study of the use of information and technology in the preparation, mitigation, response and recovery phases of disasters and other emergencies.

Keywords: Disaster Management Training; Awareness; Preparedness; Visualisation; Community.

Sticks and Carrots for implementing Disaster Resilience

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Abstract

Although the importance of disaster resilience has been well recognised at policy level, its implementation shows varying levels of success. As a result, fatalities and damage to physical infrastructure is still reported. For example, despite the existence of many policy and practice measures developed following the 2004 Asian Tsunami, Sri Lanka suffered the second largest natural disaster during the latter part of 2014. Non-implementation of the recommended measures has been cited as the main contributory reason. This situation is not uncommon in many other countries, giving rise to the question "Why do policy decisions not get implemented effectively?"

One of the approaches to implement disaster resilience is by means of regulation. This involves setting up of legislation, regulations, procedures, institutions and penalties for non-compliance. Another approach is to use incentives to encourage action towards implementation of necessary measures. A closer inspection indicates that putting policy into practice requires the alignment of regulations and incentives across many layers of governance, public and private institutions, various industries and sectors of the economy, and of the society.

Therefore, this research proposes the development of a framework to facilitate effective flow-down of incentives and regulations through organisation and process alignment and collective improvement, for successful implementation of disaster resilience. In doing so, attention should be paid to the appropriate mix of regulation and incentivisation, and the sustainability of such measures over time.

Keywords: Disaster resilience; implementation; incentives; regulation; alignment

Experiences of Coping with Flood Disaster during and Aftermath in East Coast of Malaysia: A Lesson Learnt From the Household Perspectives

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Abstract

East coast of Malaysia were devastated by an unprecedented flood recently and forcing the evacuation of an entire affected population. It has been reported that nearly a total of approximately 200 000 flood victims were being sheltered in 436 flood relief centers across the country. Households of every level looked to be particularly vulnerable during the flood disaster due to affects their quality of life and health. It is also altering their well-being and everyday life routine. The vulnerability of a person within the households require their capacity to anticipate, cope with, resist and recover from the impact of the natural hazard. Therefore, determining vulnerability is a major challenge, particularly for continuing their everyday living needs during and aftermath of flood disaster. There are no data available in regards to their experiences coping with this undesirable effect. Moreover, the truth and natural information received from the victims (elders, adults, teens, and kids) includes ethnic minorities and those on low income could also bring response and recovery that potential to reduce the adverse health effects of floods. This is because there is currently inadequate evidence of such information for the policy maker for improving the response and recovery includes the health care delivery response during the flood disaster. The main research question for this study will be 'how was the experience of households dealing with the flood disaster during and after the flood'? The purpose of this study to gain a richer understanding of households experiences and their coping strategies during and aftermath. A qualitative descriptive study guided by phenomenology methods will be employed to resolve the central research questions. The study finding should be able to contribute knowledge on households experience and provide information for the readiness and preparedness for the future flood disaster management at every level. On top of that, the output of this research project will develop a 'household emergency kit' checklist for flood disaster preparedness that can be utilized whenever an evacuation is required.

Keywords: Flood Disaster, Household, Coping, Emergency kit, and Kuantan

Risk Management in PPPs: How Governments in Transitional Nations Sustain Public Values

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Abstract

The article investigates challenges and tools of risk management in public-private partnerships (PPPs) in two ex-Soviet nations – Kazakhstan and Russia through the prism of the PPP impact on sustainability. Whilst the latter entails multiple aspects, they manifest themselves in public values that the government attaches to partnerships. From the government perspective, it is critical to ensure that public values are served in PPPs as this would provide justification for the government efforts aimed at extensive PPP deployment both in Kazakhstan and Russia. Many of these values are beyond the value-for-money concept, such as long-term postponement of privatisation in social infrastructure. The article argues that a qualitative assessment of PPP performance is required in order to appreciate social value that partnerships bring along.

Using a qualitative approach based on the interview data, the article asserts that the governments in Kazakhstan and Russia intentionally design PPP projects as low risk for a private partner, which means that the governments bear most kinds of risk. Whilst the government approach to risk management in a PPP does not match the generally accepted principle (i.e., that risk must be borne by a party best able to handle it at the least cost), the government focuses on PPP broader benefits to society. These benefits include the long-term availability of public services provided by PPPs; generation of business that supports the principal PPP activity; job creation and income generation; long-term positive impact on economic development at the regional and local levels; and enhanced collaboration and trust between the public and private sectors. The PPP benefits can be summarised as the set of positive externalities that, from the government perspective, outweigh the budget outlays and the government financial support to PPPs. The article concludes that having adopted the approach that focuses and incorporates the PPP broader benefits to society, the government supports this approach by certain risk management tools aiming to ultimately ensure society's greater sustainability.

Keywords: Public-private partnership (PPP), risk management, public value, public management, sustainability

Challenges of Resource Management Model for Disaster Risk Reduction System

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Abstract

Requirement engineering of software development for disaster recovery should be tackled in a way to resume operations for the preparation on the worst-case scenarios. Most of the applicable systems recently concentrate on the technical aspect of security and safety to prevent the implication from disaster. However, in real, the victims were too close with the resources requirements. The most worrying thing is a disaster such as floods, earthquakes and fires. Despite various efforts undertaken at all times it occurs in the world, but improvements are still needed. Recently, torrential floods occurred in Malaysia and said as a small tsunami. Most of the victims were evacuated to a nearby evacuation centre. There are various sources of needs is still not enough and not to help immediately. This study will be used an observation and reviewing a literature to come out with the enhancement of resource management system for disaster rick recovery. Based on observation, there are constraints regarding resources necessary requirements in each area having researched e-flooding system. Existing systems are not able to tell the exact needs of each area or place of displacement. Therefore, this study will be an alternative to the flood victims in helping them with the resources information and management. Indirectly, it becomes a system of high interest to the non-profit agency to deliver aid precisely. The aim of this study will provide recommendations for model improvements disaster recovery for the scope of resource management. Every detail will be in the state based on the criteria of challenges. The presence of this model, in the future prototype will be implemented more easily.

Keywords: Requirement Engineering, Disaster Risk Reduction, Resource Management, Flood.

Social Media as Main Medium for Disaster Awareness in Malaysia: An Initial Study- December 2014 Big Floods

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Abstract

In the past decade, the rising usage of social media tool called Facebook has been quite famous in Malaysia. A social medium which is focusing on Facebook become a perfect channel for any kind group of people to share their knowledge. Therefore, this study aims is to explore the knowledge-sharing behaviour during flood disaster happen last December 2014 mostly in East of Malaysia. From social media, we seems to seek a better understanding on how the society react and share their knowledge and the perspective would influence their sharing knowledge behavior in give help the humanities support to flood victims. It includes updates on the location flood happen and how the critical the condition of flood victims and types of support are should be given. Hence, we discover ways in collecting and preparing information how the acceptance from local community in nurturing the sharing behavior expertise through Facebook pages or personal account. From this initial study, we analyzing the content of Facebook page and personal account belong to the person who work out voluntarily in help the floods victims within one month from 20 December 2014 to 20 January 2015. The analyses done through content analysis based on existing theoretical framework, which is Knowledge Sharing Behaviour Theory Framework .This theory framework include Theory of Planned Behavior, Social Capital Theory and Social Cognitive Theory. Furthermore this framework also supports Dooyewerds Theory for the related aspects in disaster awareness. From the analysis, this study proposes a model that contains potential perception may influence of knowledge sharing behaviour among volunteer people and related community for disaster risk reduction.

Keywords: Social Media, Volunteerism, Knowledge Sharing, Facebook, Knowledge Sharing Behaviour Theory Framework

A Framework of Business Continuity Management for Public and Private Construction Organisations

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Abstract

Business Continuity Management (BCM) in construction is the process of identifying potential disasters that threaten construction organisations, formulating and implementing viable continuity strategies to preserve and protecting its business in the short and long term periods. It covers a broad spectrum of vulnerabilities in business and management disciplines, including risk management, disaster recovery and crisis management. The vulnerabilities in construction organisations can be categorised into seven (7) key areas: reputation; supply chain; information and communication; sites and facilities; people; finance; and customers. As such a comprehensive BCM is crucial for the fact that the construction organisations is constantly correlated to internal and external pressures, which are expected to initiate costly errors if caught unprepared in the events of disasters. For instance, flood occurrence in 2011, has affected the double track construction project in Malaysia resulting time overrun for a period of 18 months and loss and expenses of ringgit Malaysia 150 million to both public and private construction organisations. Based on the 10th Malaysian Plan (Thrust 4-Developing a Climate Resilient Growth Strategy), both public and private construction organisations is recommended to establish business continuity management framework to identify the potential impacts of disasters and its strategies. Hence, the aim of the research is to develop a Business Continuity Management (BCM) framework for public and private construction organisations. In order to achieve the aim, three (3) research objectives are established: to investigate the vulnerable sources of disasters facing public and private construction organisations; to explore the disaster impacts (i.e., time, cost, quality and resources); and to establish the BCM adoption and acceptance in public and private construction organisations. The empirical research will be conducted in two phases: Preliminary Survey (i.e., semi-structured interviews – large public and private construction organisations) and Case Studies to public and private projects involved in disasters. The findings from the research will be synthesised and used to developing a framework of business continuity management for public and private construction organisations. The framework could serve as a guideline for construction industry practitioners to combat disaster impacts in preserving and protecting business in construction organisations.

Keywords: Business continuity management (BCM); construction industry; disaster; Malaysia; public and private construction organisations;

Community Engagement and Participation in Psychosocial Reconstruction during Post-Disaster Event: Design and Development of Learning Modules

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Abstract

Conventionally, psychosocial intervention on post-disaster impacts has focused on individual trauma and psychosocial distress. However, emerging research began questioning its effectivenessin preventing long terms psychological disturbance. Many research also indicate that psychological distress is often more reflective of the hardships encountered during recovery and rebuilding rather than the impact characteristics of the event. Hence, psychological impacts of disasters cannot be sufficiently analysed within the individual paradigm. Rather it is better examined within a socio-cultural perspective which takes into account not only the individual's capacity to overcome material and physical losses but the underlying social, economic and political relationship which determine recovery capacities. My interest in this area is due to the importance of interdisciplinary aspect to recovery which emphasizes the role of collaborative social and community processes. Previous research has shown that the pressures associated with restoring housing and patterns of life can have as much impact upon psychological wellbeing. Although crisis intervention, counselling and education has its place in disaster response, these practices are in many cases helpful to only a small percentage of the population, and lack relevance to a vast number of people who are better served through tangible assistance, advice and information. Thus, this research aims at designing and developing relevant modules on community engagement and participation in psychosocial reconstruction at a broader level during post-disaster event. The modules will become guidelines for community to acquire adequate awareness, knowledge and appropriate skills to affectively deal with the psychological and psychosocial impact of disasters. The modules can facilitate recovery by helping families and neighbourhoods reclaim their autonomy and self-efficacy in the face of social disruption. This would help give sense of partnership and ownership in managing emergencies and recovery. It will also lead to better preparedness in anticipating and recovering from natural disasters. Thus, the capacity to cope with extreme events is best considered within a larger societal and communal context. Tangible support and efforts are needed to rebuild social networks and sense of community as well as to enhance the psychological health of disaster victims.

Keywords: Community engagement, socio-cultural framework, psychosocial reconstruction, inter-disciplinary approach.

Conceptualisation of Organisational Resilient Potential Framework

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Abstract

This paper presents the conceptualisation of a framework of organisational resilient potential for disaster management. Past research advocates for mitigating vulnerabilities through recognising uncertainties and subsequently developing post-disaster adaptive behaviours. A review of the literature was conducted for two major objectives: (i) to establish theoretical foundations with relevant constructs and variables in understanding organisational resilient; and (ii) to identify the gaps in the process of managing disaster. Four theoretical frameworks were identified i.e. the vulnerability model, two measurements, one for organisational resilient potential; another for continuity for operations planning; and lastly a framework for determining variables correlated to organisational resilient. Based on these, the research framework was conceptualised comprising of three main constructs; namely, summated score organisational resilient potential; summated score for organisational continuity of operations planning; and variables correlated to summated score for organisation resilient potential. Six research questions represented by six hypotheses were developed. The study subscribes to positivism, designed to survey a large population of groups of managers responsible for disaster management. The data collection instrument was a set of questionnaire on observable variables addressing the three major constructs. Responses were solicited based on a 5-point Likert scale. Data analysis was strategized at two levels. Firstly to determine model fit of the three major constructs. Secondly to establish the relationship between (i) the observable variables and their respective construct; (ii) the three major constructs; and (iii) organisational variables and summated organisational resilient potential. The findings of this study institute a model that measures organisational resilient potential and continuity of operations planning. The model also informs the variables that impact organisational resilient potential. The findings advocate for the need to for adaptive post disaster behaviours, which is beyond conventional disaster planning.

Keywords: Organisational resilient potential, disaster management, adaptive post disaster behaviours.

Cost Optimization Modelling on Rectification for Seismic Hazard Mitigation of School Building

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Abstract

Malaysia is a country with very low seismic activity. However, Malaysia is bordered by Philippines and Indonesia, which are two of the most seismically active countries and certain degree of surface waves could still be felt in our country. Earthquake effects on the building structure vary from site to site and mostly depend on the site location, structure material, foundations and building configuration. School buildings are considered as a very important structure because it contains a high density of student and teacher at most of the times. Engineers need more earthquake related knowledge to understand all the vital information that is much needed in designing the earthquake resistant building. It is vital to assess the precaution measures that can be taken and consider them in the future building design. Therefore, a systematic optimizing method needs to be implemented to help in selecting the best method of structural rectification proposal. This research aims to formulate a modelling system to design and optimize earthquake resistant school building. Borehole data for various locations in Johor Bahru will be utilised in the micro zonation analysis. All the data are compiled and used in the optimization programming that can help to identify the high potentially hazardous earthquake affected location and necessary earthquake risks mitigation which can be planned ahead. The optimization programming not only able to let engineer to distinguish area of higher earthquake risk but it could be a good reference to engineering community for future earthquake resistant building development. Optimization factor involve in the design of the earthquake resistance building are rectification cost, rectification time and rectification efficiency. The optimization programming will help engineer to design the most affordable, lowest cost, shortest construction period and highest efficiency earthquake resistance building.

Keywords: Optimization programming, hazard mitigation, earthquake, structural rectification

A Framework of Disaster Resilience for Hospitals

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Abstract

A disaster resilience hospital is the capability of the hospital to resist, absorb, and respond to the shock of disasters while still retaining their most essential functionality (i.e., pre hospital care, emergency medical treatment, critical care, decontamination and isolation). As a result, the hospital could recover to its original state or a new adaptive state. Likewise, safe and resilient hospitals are those that provide services efficiently, structurally strong, organised with contingency plans, and continue to function at maximum capacity during disasters. In spite of its importance, hospitals are themselves vulnerable to numerous types of disasters and can get damaged risking the lives of patients and health workers. Over the past few years, there is a growing body of evidence that the impacts of disasters are affecting negatively towards public and private hospitals' resilience in Malaysia. Of late during the flood occurrences at East Coast Malaysia, it has led to breakdown in electricity, water and food supply to a few hospitals albeit Malaysia has pledged the safety of 3,231 hospitals, including clinics for One Million Safe Hospitals initiative. Hence, the aim of the research is to develop a framework of disaster resilience for public and private hospitals in Malaysia. Four (4) research objectives are established: to explore the vulnerability components influencing the capability of existing public and private hospitals for disaster resilience; to assess the vulnerability level; to investigate the challenges hindering the capability in achieving disaster resilience; and to establish adaptive strategies. The empirical research will be undertaken in the form of survey and case studies. Initial Survey were employed to seven respondents (focus group approach) and eight documents (document analysis). As a result, an assessment tool (questionnaire) is developed to 40 respondents (public and private organisations). The results of the survey will be underpinned by case studies (public and private hospitals). The findings from the research will be used to develop a framework of disaster resilience for hospitals which was validated to confirm its external validity. The framework may serve as a guideline for hospitals' stakeholders in achieving a better performance of hospital services during disaster occurrences.

Keywords: Disaster resilience; hospital disaster resilience; Malaysia; public and private hospital; survey and case studies

Acoustic Mapping Technology for Various Underwater Applications

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Abstract

There are many situations where details information is required underwater (at sea, rivers, lakes) such as for search and rescue mission, wreck and hazard detections, geological seabed identification, marine and fishery studies and many more. Although direct inspection using underwater cameras and divers are possible, these techniques are time consuming and difficult for example with high current at deep water, limited visibility (high water turbidity) and also not practical for large area. To overcome these problems, many agencies, institutions, researchers are starting to use underwater remote sensing to detect, study and acquired seabed (or riverbed and lakebed) properties and information using acoustic sensors from the water surface. This study will highlight the concept of acoustic mapping technology that can be used to extract seabed profile and detect objects. There are three main acoustic mapping techniques often used in underwater applications; single beam echo sounder (SBES), side scan sonar (SSS) and multi beam echo sounder (MBES). Although these three mainly used in mapping applications, there were originally developed for defence and military purposes. SBES provides the ability to record water depth using signal transmitted from the sonar's transducer and returned back. By using two-way travel time of the signal and sound velocity in the water, depth can be computed. Apart from depth, some SBES systems have the capability to measure the level of energy (intensity returns) reflected by different sediment types where it could be used as proxy for seabed identification. SSS on the other hand only recorded intensity level but offered a better spatial coverage and high resolution intensity image resolutions as compared to SBES. This system is commonly used to provide initial information for search and rescue mission and object detection on the seabed. It also has been used to map and identify coral reef areas and complex seabed structures. MBES system, which is designed to transmit hundreds of signals at one time (up to 500) at different beam angles, capable of achieving high resolution bathymetry with 100% spatial coverage. With the latest advancement, current MBES not only provide depth, but also co-located intensity returns as the SSS where this data is important for geological and biological studies. With various acoustic mapping sensors, users will have a better chance of 'looking' remotely underwater without having to do direct inspection using traditional or conventional methods. Data from these acoustic sensors could be used for various applications including for disasters and rescue mission and for marine conservation purposes.

Keywords: Underwater inspection, sonar technology, acoustic mapping, search and rescue, marine conservation

Force Majeure Clause in Standard Form of Contract: Revisiting the Unforeseen and Beyond Control of Construction Contract

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Abstract

The primary aims of construction contract provisions are to clarify responsibilities, obligations, liability and allocation of risk among parties to the contract. It extends the roles and mechanism to execute the contract that strikes risk balance to the construction project. Risk allocations in contractual provisions rely heavily on the contract drafter who normally captured as much possible spectrum of risk in minimising impact to the contracting parties. It is impossible to include every identifiable risk in the contract provision therefore leaving behind fraction of risk imbalance. Disaster risk is one of the risks that were occasionally defined clearly in the contractual clause. Parties to the contract are normally left with minimal remedies option in any event of disaster. Most insurance and loss/expense clauses in standard form of contract covers limited capacity and rarely have an extensive scope for disaster. As an alternative, a force majeure clause is introduced as means to cover wide range of unforeseen and beyond control events (not limited to disaster) that caused by both nature and man-made. It exists to temporarily relieve parties to the contract from performing their contractual obligation when any unforeseen event strikes. However, the remedies offered under force majeure clause normally in the form of extension of time and to an extreme condition, contract termination as a result of prolonged force majeure event. The impact of such remedies may give positive or detrimental effect to contracting parties. The force majeure definition itself is debatable and each standard form of contract adopts the clause and interprets its scope differently. The issue of comprehensive definition, scope and remedies of force majeure clause are central to this study in an attempt to infuse disaster risk into the contract clauses. Comparative study between standard forms of construction contract revealed that there is a need for an improved definition and interpretation of several contract clauses that will assist in leveraging the risk allocated among parties to the contract.

Keywords: Force majeure, disaster risk, contract clause, risk allocation

Exploring the Role of Human Factors and Ergonomics in Disaster Management

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Abstract

My research focuses on human factors and ergonomics with a special emphasis on the application of user-centred design that spans across different disciplines. I am particularly interested in exploring the versatility of heuristics evaluation (analytical evaluation by experts) as a method to indicate usability of a system and goes beyond simply using it to evaluate graphical user interface (e.g. its application to evaluate any other designs such as building, multi modal transportation, etc.). I am currently establishing a methodology on how heuristics for specific domain and purposes should be established, verified and validated. The work is currently ongoing with two use cases served to validate the methodology. I am also interested in the application of participatory ergonomics in developing countries as a means to involve users and stakeholders while solving existing health and safety problems. I have started collaboration in this area with academics from Indonesia. I have found that the uptake of participatory ergonomics was low and potentially one of the sources of ongoing health and safety problems in Indonesia. For the past three years, I have also been involved in the application of virtual reality technology to support training. This involves utilisation of a highly immersive environment such as CAVE to less immersive environment but using natural user interface such as Kinect Technology and WiiMote. As a result of project completion, I have gained practical knowledge on best practices in integrating these tools as part of virtual training. In addition to this, I have also acquired knowledge in translating training into virtual training modules and establishing appropriate measures for evaluation of trainees' performances.

I am specifically interested in two aspects i.e. 1) exploring the possibility of expanding heuristics evaluations and the principle of participatory ergonomics approach within the context of disaster management and 2) identify the gap and limitation towards the use of virtual reality in disaster management especially for developing countries and identify ways to minimise the limitation.

Keywords: Human factors, heuristics, participatory ergonomics, virtual reality, disaster management

Urban Flood Risk Management in a Changing World

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Abstract

Flooding presents a significant and growing challenge to the United Kingdom and the wider world. Urbanisation coupled with climate change caused by anthropogenic activities is expected to increase the flood risk. This threat is likely to escalate. Traditionally, hard engineering measures (grey infrastructure) such as embankments, sewer system, flood walls, etc. are used in the cities to minimise the flood risk. However, grey infrastructure generally fails to accommodate other aspects of integrated water management such as water quality, ecological values and public perception. Although, grey infrastructure as flood protection measures are very beneficial during flood conditions they are much less useful in non-flood conditions. In the UK, there is a paradigm shift from grey to green imitative is a more promising concept for sustainable urban flood risk management. This paper outlines two UK EPSRC research projects on urban flood risk management.

The first project 'Blue Green Cities' is to recreate a naturally-oriented water cycle while contributing to the amenity of the city by bringing water management and green infrastructure together. This is achieved by combining and protecting the hydrological and ecological values of the urban landscape while providing resilient and adaptive measures to deal with flood events. Blue-Green Cities generate a multitude of environmental, ecological, socio-cultural and economic benefits. The innovative Blue-Green approach to water management in the city aims to satisfy the demands of urban drainage and planning via coherent and integrated strategies, and places value on the connection and interaction between blue and green assets. More information about the 'Blue Green Cities' project can be accessed through (http://www.bluegreencities.ac.uk/).

The second project 'SESAME' aims to develop tools that encourage Small Medium Enterprises (SMEs) to discover ways of becoming more resilient to floods and to appreciate how adaptation can help protect them from on-going flood risk. Many of the UK's 4.5 million SMEs are exposed to the effects of flooding. As SMEs represent almost half of total business turnover in the country, their protection is a vital part of the country economy. However, few have measures in place to ensure the continuity of their activities during a flood and its aftermath. This project also assesses the impacts of flooding on economic systems both within and beyond the immediately affected urban area and explores how changed behaviours could influence these impacts. Further information on the 'SESAME' project can be accessed through (http://sesame.uk.com/index.php).

Key words: Blue Green Cities, Urbanisation, Climate change, SMEs, Flood resilience

De-Signing the Future

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Abstract

The idea of city 'fabric' suggests a continuous whole produced from smaller, interlocking, interdependent fibres whose individual identity are lost or given up to the idea of the whole. The strength of the fabric is reliant on how well that fibre is embedded within the whole. The idea of 'city fabric' is then an idea of the beauty of efficacious subservience (how gauche!) to the whole.

Design means to designate, to define, to assert control. The harder the edges the better, the more clearly defined the authors' handwriting the more the object is "lifted" from the whole.

Ideals of DESIGN it seems then are at odds with the ideal of fabric. I wish to build on this schism and introduces the idea of DE-SIGN.

DE-sign - to eliminate the need for signs

DE-sign - to obscure the creator's signature

DE-sign - to allow for multiple interpretations of use

My Research explores a trend for ever increasing hyper-specificity and controlled identity - the object as 'figure'.

Versus

A continuous platform for the support of life where site and building become indistinguishable as 'ground';

or Design versus De-sign.

De-signing involves identifying the nature of duality, pluralism and contradiction and reacting with rather than against it. What was once regarded as a weakness to be avoided at all costs might be the strength upon which a new urbanity could be based. Using constructivist principles of factura and tektonika we map city fabric and identify space and time and not style but as the definitive agents of social utility.

By "tectonic" we mean the act of creation, the idea or fundamental concept based on social utility; and by facture we mean the natural propensities and innate expression of materials.

'Fabric' is defined through connected autonomy as the basis of resilience.

Keywords: Design, City Fabric, Resilience, Autonomy.

A Framework for Sustainable Electronic Court Records Management System

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Abstract:

Malaysia has embraced e-Government environment in providing its public services to the people since the last decades. The institutionalisation of technologies in the judicial setting in Malaysia has taken place since 2009 when a number of e-Court applications were implemented. The Case Management System, Electronic Filing System, Queue Management System and Court Recording and Transcribing System are well in place and manage to reduce the case backlogs and expedite the current case management process and justice dispensation tremendously. However, the sustainability of the system is not guaranteed due to the fact that the e-Court applications have not been properly implemented based on an established sustainability framework for long term preservation and disaster preparedness. This research aims to develop a sustainability framework for electronic court records management which consist of two layers, first being the requirement to follow the appropriate electronic records management lifecycle; and second, the legal compliance framework, which requires every electronic system to comply four (4) level of legal requirement i.e. the ISO standards, the legislations, the national policies and the organisational policies which focus on the sustainability domain including secure backup procedures, audit trail and other risk management features. Failing to conform to these requirements posts a risk of non-compliance which can result a severe consequence such as legal penalties, bankruptcy or total loss. In evaluating issues related to electronic court management, a number of related theories were applied such as risk management and sustainability development theories. These theories are interesting to be tested in such environments and relates very much with the issue of risk at organisational, national and international level.

Keywords: E-Court, Risk Management, Sustainability Development, E-Government, Courtroom Technologies.

Landslide Susceptibility Mapping From High Resolution Remotely-Sensed Data

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Abstract

Rapid population growth has intensified urban, mountain and coastal development in the Asia and the Pacific region, which are increasing human-induced landslide hazard and landslide vulnerability in urbanized areas. Application of landslide prevention technology is required in areas such as cultural heritage sites and other locations of high-societal values, where relocation and early warning are not possible or very difficult. The most cost-effective measure to mitigate landslide disasters is early warning and evacuation. Timely prediction and early warning technology, suitable for the Asia and the Pacific region should be developed. Landslide occurrence depends on various interrelating factors which consequently initiate to massive mass of soil and rock debris that move downhill due to the gravity action. Remote sensing techniques for landslides studies are undergoing swift developments. The possibility of acquiring 3D information of the terrain with high accuracy and high spatial resolution is opening up new ways of investigating the landslide phenomena. One of the most advance technology in remotely sensed application is Light Detection and Ranging (LiDAR). LiDAR has become a progressive approach in mitigating landslide by permitting the formation of more accurate DEM compared to other active space borne and airborne remote sensing techniques. The objective of this research is to assess the susceptibility of landslide in UluKlang, Selangor area by investigating the correlation between past landslide events with geo-environmental factors. A high resolution LiDAR DEM was constructed to produce topographic attributes such as slope, curvature and aspect. These data were utilized to derive second deliverables of landslide parameters such as topographic wetness index (TWI), surface area ratio (SAR) and stream power index (SPI) as well as NDVI generated from IKONOS imagery. Subsequently, a probabilistic based frequency ratio model was applied to establish the spatial relationship between the landslide locations and each landslide related factor. Factor ratings were summed up to obtain Landslide Susceptibility Index (LSI) to construct the landslide susceptibility map.

Keywords: Disaster, Landslides, Remote Sensing, LiDAR

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