cabaret

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REGIONAL INNOVATION HUB
TERMS OF REFERENCE & WORKPLAN

VERSION HISTORY

Version	Date	Comments
1.0	10th January 2018	Initial draft that sets out plans for initiating sandpits
1.1	12th April 2019	Updated with sandpit arrangements and workplan

DISCLAIMER:

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1. Introduction

This document introduces a regional innovation network on multi-hazard early warning (MHEW) that will assist in strengthening MHEW Systems at all levels in Asia, while also facilitating knowledge transfer with Europe and other regions. The network will seek to influence policy and decision-making processes as means to meet the cognitive and normative challenges in positioning MHEW systems and preparedness in the wider context of social change in the coastal societies and communities at risk. Thematic areas will be identified to promote innovation, and disseminate knowledge, lessons learnt and experiences. The forum will also seek to further stakeholder engagement, capacity building and knowledge sharing, building upon the priorities identified in the regional position paper. The network will achieve its objectives through sandpit events, short term scientific missions and training workshops. The network will be self-directed by its members, initially drawn from partner representatives. This document is a Terms of Reference and work plan to govern the network. The network will also provides a means to sustain the regional cooperation after the CABARET project has finished.

1.1. CABARET project

This regional innovation hub has been developed as part of CABARET (Capacity Building in Asia for Resilience EducaTion), a project co-funded by an EU Erasmus+ programme within the European Union that aims to strengthen research and innovation capacity for the development of societal resilience to disasters. CABARET is providing support to build capacity for international and regional cooperation between HEIs in Asia (region 6) and Europe, and among Asian HEIs themselves, to improve MHEW and increase disaster resilience among coastal communities.

CABARET is addressing the cognitive and normative challenges in positioning early warning and preparedness in the wider trajectories of social change in societies and communities at risk. It is an imperative to take an integrated and holistic approach to early warnings for multiple hazards and risks tailored to user needs across sectors.

The new UN Sendai Framework for Disaster Risk Reduction, agreed by member states in 2015, includes a strong call for higher education to support the understanding of disaster risk and promote risk-informed decisions and risk sensitive planning from local to global levels. Researchers and academics, therefore, must work at the regional level, and with policy makers and practitioners to co-design and co-produce research that can be used effectively. Higher education must also play a vital role in translating that research into action through its educational programmes. Capacity should be developed through scientific research and development of knowledge bases as well as through education and training.

CABARET runs for three years, from October 2016 to October 2019. The project is led by the University of Huddersfield's Global Disaster Resilience Centre (GDRC), based in the United Kingdom. They are joined by a consortium of 15 European and Asian HIEs from Bulgaria, Indonesia, Latvia, Maldives, Malta, Myanmar, Philippines, Spain, Sri Lanka and the UK. Further the project works with 3 associate partners of Asian Disaster Preparedness Centre (ADPC), IOC/UNESCO and the Federation of the Local Governments Association in Sri Lanka (FSLGA).

The project sets out to identify research and innovative capacity needs across Asian HEIs in Indonesia, Maldives, Myanmar, Philippine and Sri Lanka, and to build capacity to broaden early warning to provide a comprehensive, multi-hazard framework.

This innovation hub provides regional innovation infrastructure to promote scientific cooperation and knowledge transfer. It will stimulate EU-Asia and Asia-Asia peer-to-peer cooperation by bringing together experts, including academia, government and civil society, on MHEW issues. It will promote the piloting and testing of locally prioritised actions for MHEW and communicate results and lessons through regional knowledge networks.

WP4 will also support innovation in HE at the regional level towards reaching the most remote and vulnerable population with timely, meaningful, and actionable warning information. Several gaps persist due to weak coordination among the actors and agencies concerned at the national and regional level, low

public awareness and participation as well as insufficient political commitment. Additional efforts are needed to institutionalise and strengthen multi-hazard, end-to-end, people-centred EWS for all communities, and to deliver warnings from one authoritative source or "voice", as wellas as to address key gaps such as cascading consequences. WP4 will provide a context to catalyse new collaborative projects, connect perspectives, and build capabilities through training and courses.

1.2. Why is an Innovation hub required?

As highlighted in the national and regional position papers published by the CABARET project (Haigh, Amaratunga and Hemachandra, 2019), the Asia-Pacific region is regularly labelled as the most disaster-prone in the world due to a long history of both major catastrophic disasters and frequent small and medium-sized events. However, climate change, environmental degradation and other factors have resulted in a risk landscape for the region that is increasingly uncertain. Specifically, acute vulnerability to drought in so-called least developed countries, such as Myanmar, contributes significantly to the regional risk level.

The CABARET regional position paper made clear the relationship between disasters, climate change and sustainable development clear. Climate-related hazards are particularly prevalent along coasts, which is where many Asian cities are located. Urban areas also concentrate risk and many of the region's urban population lives in informal settlements. People living informally will be the worst affected by disasters, because they lack access to basic services and security of tenure and do not have the voice or means to substantially improve their living conditions.

In order to address such disaster risk, the regional paper also stressed the important of effective, multi-hazard warning systems. Traditionally, many countries have been reactive to disasters experiencing significant losses in lives and livelihoods of their citizens. Adoption of the Hyogo Framework for Action (HFA) 2005–2015, and more recently, the Sendai Framework for Disaster Risk Reduction 2015-30, has led to a paradigm shift in disaster risk management, from emergency response to a comprehensive approach which also includes preparedness and preventive strategies to reduce risk.

The Sendai Framework for Disaster Risk Reduction 2015–2030 recognises the benefits of multi-hazard early warnings systems and enshrines them in one of its seven global targets: "Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030".

1.3. What are the priorities for the innovation hub?

The five in-country analyses and regional paper prepared by CABARET identified the need for a cooperative mechanisms on MHEW, so that countries will be better able to share good practices, expertise and capacities in assessing risks, developing sustainable monitoring and warning services, creating proper dissemination and communication systems, and coordinating with communities to increase response capabilities. Higher Education, as a key actor in developing capacity and developing scientific knowledge, has an important role in improving this type of regional cooperation, as illustrated in Figure 1 (Haigh, Amartunga, & Hemachandra, 2018).

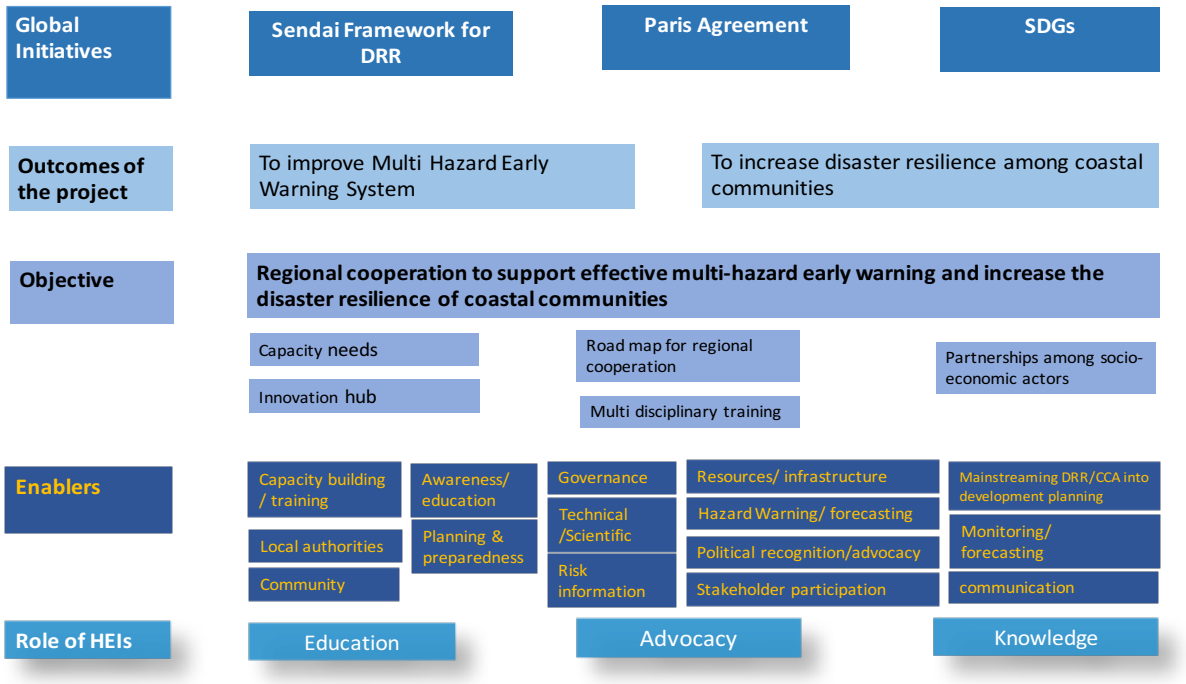

Figure 1: Conceptual framework to describe how could HEIs contribute to achieve global initiatives through the development of effective MHEW

The innovation hub has been established to address the gaps and priorities identified in the five in-country analyses and regional papers. A summary of these gaps and recommendations are provided below.

Improve capacities for tsunami preparedness

Hazard and risk assessments

1. Increase engagement of other national, regional or international actors in the carrying out of tsunami hazard and risk assessments
2. Increase the availability of publicly accessible data for tsunami hazard and risk assessments
3. Increase the capacity for tsunami hazard assessment, especially in the areas of evacuation mapping, hazard mapping and inundation mapping
4. Capitalise on the existing capacity in Member States for delivering training on hazard mapping and inundation mapping
5. Increase the capacity for city, village and community level tsunami risk assessments
6. Increase the capacity for developing products from tsunami risk assessments, such as risk maps, evacuation maps, guidelines and action plans

Policies, plans and guidelines

7. Provide support to increase availability of tsunami policies, plans and guidelines at the prevention and mitigation, preparedness, and recovery and reconstruction phases of disaster management
8. Provide support to increase availability of tsunami policies, plans and guidelines at the local level, either as standalone or as part of a multi-hazard approach

Detection, warning and dissemination

9. Provide support to increase the capacity for analysing real-time seismic and sea level data for tsunami threat
10. Provide support to increase the capacity for tsunami modelling to support generation of threat forecasts
11. Undertake a further study to examine whether there is a need for so many different software tools to be used to analyse data for tsunami threat or tsunami modelling

12. Increase the frequency of tabletop or similar tsunami warning exercises to review and test SOPs, and reduce the potential for complacency among countries that have not experienced a recent tsunami event

Public awareness, preparedness and response

13. Provide support for countries to improve their SOPs at the interface between upstream and downstream, including the operation of a 24/7 emergency operation centre, receiving information from the NTWC, and response criteria and decision making, as well as the associated human resources and infrastructure
14. Provide support for countries to improve their SOPs to address warning dissemination, communication with the NTWC, communication with other stakeholders, evacuation call procedures, communication with local government and media arrangements, as well as the associated human resources and infrastructure
15. Provide support for the development of community level evacuation SOPs
16. Capitalise on the willingness of countries to share their SOPs to share good practices across Member States

Evacuation infrastructure

17. Provide training and share Member States' experience of different types of evacuation infrastructure

Tsunami exercises

18. Provide support to incorporate tsunami level exercises into cities, villages, communities and schools

Public awareness

19. Provide training and share Member States' experience of different public engagement materials
20. Develop educational materials such as teaching kits, and encourage the incorporation of tsunami awareness into the school curricular
21. Raise awareness of the Global Disaster Risk Reduction Day and Tsunami Awareness Day

Improve capacities for MHEW

22. Significant efforts must be made to assure the adequacy of existing EW and communication of EW to reach "last mile" in the region.
23. Continuously evaluate and monitor the current status of existing early warning systems
24. Develop mechanisms for regional cooperation, including greater knowledge sharing and networking
25. Mainstream early warning into development planning
26. Increase disaster education and awareness raising
27. Develop inclusive and context specific disaster preparedness plans
28. Develop supportive policy and institutional frameworks
29. Develop technological systems for real time monitoring and forecasting
30. Increase multi-stakeholder partnerships, collaboration and networking

Increase engagement of HEIs in capacity development for MHEW

Education

31. HEIs should engage in capacity building among community through education, awareness and training
32. Develop more curriculum that address disaster risk reduction and resilience

33. Understand the needs to employers, including public authorities, NGOs and the private sector, to ensure that programmes for disaster risk reduction meet sector needs
34. Encourage students to conduct research in the area of disaster management, resilience and MHEW to facilitate evidence-based policy making
35. Incentives can be offered to encourage faculty to support capacity-building of stakeholders
36. Encourage the natural curiosity of students towards sciences in the midst of cultural expectations

Knowledge development

37. HEIs should be a place for training and technician incubators on disaster management in Asia
38. Build collaborations between HEIs and governments in conducting applied research
39. Deloading schemes are needed to allow faculty more time for research
40. Encourage relevant research with long term societal impact, fostering reflexive research attitude in young researchers
41. Provide an institutional environment that support trans disciplinary contextual research
42. Formulate and conduct research that integrates aspects such as long-term sustainability and resilience of communities as key focuses

Advocacy

43. Establish communication mechanisms between governments and HEIs to deliver outcome of evidence-based research
44. Create inter-ministerial cooperation
45. Give opportunities to more engage in local processes, as well as in international bodies and technical working groups
46. Academic staff should be trained to work with government organisations that have the specific mandates in the fields of MHEW and disaster resilience
47. Continuous dialogue is required among agencies to encourage better coordination, encouraging and supporting researchers to work with other stakeholders
48. HEIs should not be limited to evidence-based policy making but also need to create industry – HEI linkages for mutual benefits
49. Inter-HEI exchange (national and international) can be used as a way of increasing the role of HEIs in resilience education

1.4. Definitions

Hazards: A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation (UNISDR, 2017).

Disaster Risk Reduction: Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development (UNISDR, 2017).

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UNISDR, 2017).

Multi-Hazard Early Warning: An early warning system is an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events (UNISDR, 2017).

Higher Education Institutions: Higher Education Institutions are referred in the report as institutions that provide higher, post-secondary and tertiary education to students.

Region 06: According to the European Commission, following countries are categorised within the Region 6: Afghanistan, Bangladesh, Bhutan, Cambodia, China, DPR Korea, India, Indonesia, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam.

Members states of the Indian Ocean Tsunami Warning and Mitigation System: Twenty-eight (28) Member States within and boarding the Indian Ocean: Australia, Bangladesh, Comoros, Djibouti, France (Indian Ocean Territories), India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Singapore, Somalia, South Africa, Sri Lanka, Tanzania, Thailand, Timor-Leste, United Arab Emirates, United Kingdom (Indian Ocean Territories) and Yemen.

2. Methodology

A series of research sandpits were established in March 2018 at the CABARET workshop held in Kandy, Sri Lanka.

Sandpits are commonly used in the UK by research councils to stimulate new research ideas that they will then look to support / fund. They are interactive workshops over multiple days and participants from across the partners. The sandpits have a highly multidisciplinary mix of participants to drive lateral thinking and radical approaches to address major regional challenges in multi-hazard early warning, whether they be related to policy, research or education. The sandpits are intended as intensive discussion forums where free thinking is encouraged to delve into the problems on the agenda to uncover innovative solutions.

2.1. Approach to developing sandpits

Guidance for proposing sandpits was issued in January 2018, with a view to finalising the sandpits in the March 2018 workshop. Each sandpit is led by a nominated representative from the partnership who defines the topic and facilitates discussions at the event.

The process included: Defining the scope of the issue; Agreeing a common language and terminology amongst diverse backgrounds and disciplines; Sharing understanding of the problem participants' expertise; Using creative and innovative thinking techniques in break-out sessions to focus on a problem; Turning sandpit outputs into a project or defined action.

Participants at the workshop were invited to provide ideas and interest for broad topics that will be addressed in the sandpits, and also volunteers to lead them. Ideas could be linked to a person's own areas of interest, but should address the national and regional capacity analysis studies.

Proposals were submitted in advance of the March meeting using the template in Table 1. Seven proposals were received and the proposers were invited to present their idea on Friday 9th March during the workshop. Due to some overlap between two proposals, those were combined to form a single group. Six sandpit groups were taken forward.

Table 1: Template for proposing sandpit group

Title of topic for the sandpit:	
Proposed leader of the sandpit:	
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	

All workshop delegates were then invited to join a sandpit group. Partners were encouraged to spread themselves across different groups to ensure an international, multi-institutional and multi-

disciplinary composition. The sandpits had a series of initial meetings during the Kandy workshop and were required to complete the reporting template shown in Table 2. A rapporteur from each sandpit summarised the outcomes of the discussion to the plenary group.

Table 2: Discussion and reporting template for sandpit group

Title	A short title for sandpit
Research area	A brief summary of the broad research theme or issue being addressed – this should be presented by the proposer or nominee
Group members	Who is taking part, including any roles assigned (leader, rapporteur etc.? Ask all group members to introduce themselves, their expertise, and initial areas of interest concerning the topic
Scope of the challenges *relevant to the sandpit*	Explore initial scope of the sandpit, based on proposal. This may evolve during the discussion. Identify any boundaries.
Problems and challenges identified by group members	Agree a common language and terminology amongst diverse backgrounds and disciplines – define any key terms. Share understanding of the problem or challenge from the perspective of participants' expertise. Identify what type of expertise is required to address each problem / challenge, including any synergies. Identify a list of specific problems or challenges that you wish to address.
Proposed activities with time frames	What activities are you proposing to address this problem or challenge? What expertise is required? Over what timescale are these activities to be undertaken? What support do you need from CABARET?
Expected contribution from the proposal	Outcomes are not pre-determined but will be defined during the sandpit. A variety of outputs and outcomes are envisaged, ranging from a single large research project, to several smaller projects, feasibility studies, networking activities, overseas visits and so on.

2.2. Anticipated outcomes and resources

A variety of outcomes for the sandpits are envisaged, ranging from a single large research project, to several smaller projects, feasibility studies, networking activities, overseas visits and so on. Outcomes are not pre-determined, but are defined during the sandpit. Where possible, we will use CABARET

resources/funding to support follow up activities that emerge from the sandpit, for example through short term scientific missions.

Facilitate short term scientific missions

Selected staff from partners will benefit from meaningful exposure to the other institutions, as per the processes set out in WP5 and WP6 of CABARET. The missions will be intra and inter-regional, including Asia-Asia and Asia-Europe, exposing staff to different cultures and a range of stakeholders, including private enterprises (including SMEs), non-profit or charitable organisations, international organisations, and national & local governments with a focus on scientific/ technological knowledge through individual/personalised projects. Selection procedures including key dates, who can apply, how to apply, what information needs to be submitted along with the application, assessment procedures will be established which are open, efficient, transparent, supportive and internationally comparable, as well as tailored to the type of opportunities available.

Deliver innovation training workshops

A series of face-to-face workshops will be held in Asia:

October 2018	Yangon, Myanmar
March 2019	Manila, Philippines
January 2020	Bandung, Indonesia

The precise content will be developed based on the regional position paper (WP1) and the workplan of individual sandpit groups. The training will seek to optimise open knowledge sharing on MHEW at the regional level. It will also foster the capacity of partners to use and learn from the latest innovation expertise and methodologies. The workshops will support capacity development with an increasing emphasis on expanding collaborative and networking functions and mechanisms.

2.3. Management of sandpits

All sandpits are led by an institutional lead from across the CABARET partnership. Sandpit leads should report progress to the steering committee on a six-monthly basis. Decision making within the sandpits should be made democratically among the membership. Where necessary, conflict resolution procedures follow the same process as set out in the CABARET Terms of Reference.

1. The parties will try to resolve the conflict between them in a friendly and informal way;
2. If this attempt fails, it will be discussed during the first scheduled meeting of the Steering Committee, or if the issue is urgent, an ad hoc meeting of the Steering Committee will be convened by the Project Coordinator, at the request of at least two partners;
3. The issue will be examined thereby;
4. If consensus cannot be reached, decisions will be taken by majority vote of the Steering Committee;

2.4. Sustainability of the sandpits after the CABARET project

The future of individual sandpits is to be determined through the sustainability plan of the project.

3. Innovation sandpits

Title of topic for the sandpit:	Enhancing Disaster Resilience Education in Asia
Proposed leader of the sandpit:	Charlotte Kendra Gotangco & Crisanto Lopez, Ateneo de Manila University, Philippines
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	Outcomes of the national assessments of Asian partner countries of the CABARET project revealed the need to enhance disaster resilience education in our respective countries and in the region. Specifically, there is a need to encourage inter- and trans-disciplinary approaches which integrate theory, methods and skills in both the physical and social sciences in a solutions-driven and systems-oriented program. This sandpit event can serve as a venue for participants to share their experience and lessons learned from existing disaster resilience education initiatives, and to exchange ideas for how to expand and strengthen these efforts. Outcomes of the sandpit can include proposals for exchange programs among Asian partners and between Asian and EU partners (i.e. to immerse in and learn from institutions who are offering disaster resilience education and research programs); proposals for joint workshops or short courses; and a list of potential funding agencies for curricula/program development and implementation. Also crucial to the design of educational programs is first understanding what the barriers and opportunities are for implementing these, from the perspectives of both the offering universities and their target students. The sandpit event can also serve an opportunity to develop a concise research plan to identify and understand these helping and hindering factors.

Title of topic for the sandpit:	Evacuation planning, delays and vulnerable groups
Proposed leader of the sandpit:	Dr Chaminda Bandara, University of Peradeniya, Sri Lanka Dr Chandana Siriwardena, University of Moratuwa, Sri Lanka
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	This sandpit proposal is to discuss and find answers to three identified questions: (1) knowledge and accuracy of early warning issued by authorities and the trust of end users (people) on these early warning, (2) reasons for late reactions of end users after receiving the early warning and (3) what are the plans for evacuating people with special needs immediately after early warning as a prioritized activity. These three questions are coming under the following three broad areas; (1) Hazard risk assessment (knowledge & accuracy), (2) Warning and dissemination (response of people for warning) and (3) Evacuation and evacuation centers. To find answers to these three questions, innovative ideas from a diverse group comprised with academics of HEIs in Asia and Europe are expected. Then a road map and an action plan will be prepared. Having the answers, the expected main outcome would be early warning authority and end user engagement towers trust building, quick actions and proper evacuation. This may be achieved through awareness programmes for the early warning authorities and end users. Journal / conference publications are expected to reveal the outcome.

Title of topic for the sandpit:	Local Government and Risk Mapping at local level
Proposed leader of the sandpit:	Dr Febrin Ismail and Dr. Taufika Ophiyandri, Andalas University, Indonesia
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	This particular event is focusing on how HEIs can contribute in enhancing the capacity of local government in conducting risk assessment at the local level. Background: - Local government is very important in DRR - Local government has low capacity in Disaster Risk Knowledge - Low contribution of HEIs The discussion will include: - Why local government has low capacity - How HEIs can involve in increasing capacity of local government - Method for conducting disaster risk assessment - DRR Guidelines The intended outcomes: - Research proposal. - Workshop and training proposal. - Academic papers

Title of topic for the sandpit:	Uptake and implementation policies on Public Private Partnership (PPPs) to stimulate private sector engagement and investment for Multi-Hazard Early Warning (MHEW) Systems for Coastal Resilience in Asia
Proposed leader of the sandpit:	Dr Champika Liyanage, University of Central Lancashire, UK
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	Multi-hazard early warning systems provide a single, cost-effective channel for addressing all types of hazard. They can deliver alerts on cyclones, storms surges, and temperature extremes, as well as on the resulting impacts such as floods, diseases and physical damage. This is important because different hazards can influence one another or occur simultaneously (World Meteorological Organisation, 2015). For example, tropical cyclones cause wind damage but can also lead to storm surges and coastal inundation. State-of-the-art multi-hazard early warning systems (MHEWs) should be integrated with national development planning and investment for climate resilience and preparedness. This more sophisticated, full-spectrum approach to disaster risk reduction, which relies on building partnerships among different agencies and sectors, can greatly reduce the damage caused by multi hazards. Government representatives from different sectors – including health, transport, environment, agriculture, finance, development cooperation - require hazard information for better planning; whilst private sector entities that play a major role in the provision of data and information, and the operations of systems key to MHEWS efforts (UNISDR, 2017). Moreover, both these sectors, i.e. public and private sector, also play a key role in investing in the implementation of State-of-the-art MHEWs. Therefore, cautious emphasis should be given to public-private partnerships (PPPs) as a mechanism not only to finance such state of the art systems but also to implement activities relating to capacity building and knowledge sharing of activities relating to MHEWs, in order to reap the benefits of such systems fully.

Title of topic for the sandpit:	Disaster and Climate Change Resilience in Small States, Islands & Archipelagic States & Remote Regions
Proposed leader of the sandpit:	Ruben Paul Borg, University of Malta, Malta
Co-proposers of the sandpit (if applicable):	Fathmath Shaziya, Maldives National University, Maldives
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	BACKGROUND: Small island developing states (SIDS) have been identified as particularly vulnerable to natural disasters and climate change. However, although SIDS have similar geographical features, natural hazards produce different outcomes in different states, IMF (2016) ▪ Small developing states are disproportionately vulnerable to natural disasters. ▪ One-third of small developing states are also highly or extremely vulnerable to climate change in the lifetime of the current generation. ▪ Well-designed domestic policies can reduce the direct human and economic costs of climate change and natural disasters. ▪ Financing is needed for risk reduction and response to natural disasters and climate change. ▪ On climate change, financing has been oriented toward mitigating greenhouse gas emissions rather than helping small states adapt to global warming. ISSUES TO ADDRESS: ▪ Small Island States, Archipelagic States & Remote Regions present specific and different challenges; Remoteness & Archipelagicity ▪ Assessing disaster risks: what kind of knowledge is required? who produces the knowledge? How can the knowledge be applied to increase preparedness, early warning systems, contingency planning? ▪ Capacity Building: Internal capacity for small islands and remote regions for disaster response: essential development and resources; essential considerations; capacity building and enabling wide audience; ▪ Resources: Limited resources management; isolation: why are regions isolated and how is this addressed; Connectivity between Islands

	facilitated; connections with neighbouring larger regions and countries; Communication systems; ▪ Development Planning & Resilience: Development planning and economy; Resources and Waste startegies; FOCUS: Coastal communities and their vulnerabilities; Built Environment; early warning system and preparedness; Multidisciplinary approach;

Title of topic for the sandpit:	A detailed study of the technical, legal and socio-cultural complexities involved in communicating coastal based multi hazard early warning to jurisdictional agencies and response partners
Proposed leader of the sandpit:	Professor Dilanthi Amaratunga, University of Huddersfield, UK
Co-proposers of the sandpit (if applicable):	
Scope of the issue (this may evolve / be refined during the sandpit, but will be used to encourage people to join) / maximum 200 words	This study will focus on the interface between upstream detection of the coastal hazards, to the downstream response, including potential evacuation of the exposed communities. This interface involves a wide array of jurisdictional agencies and response partners, including national contact points, and a range of sub-national emergency operational centres and related actors. Protocols and standard operating procedures for processing and issuing warnings vary greatly at the national and sub-national levels and it is possible that same agencies are involved in multiple hazards. Experience over recent years of the impacts of hazards has shown that inadequate preparation for, and response to, emergency situations have contributed to widespread damage and the avoidable loss of lives and livelihoods. These hazards set back economic development in both developed and developing economies, and tend to disproportionally affect the most vulnerable in society. The shortcomings in preparation have been due to a lack of warning through poor regional detection and communication systems, but they also reflect inadequate awareness, planning and coordination. Recent studies and practical experiences from the Indian Ocean region suggest that more attention needs to be paid to the cognitive and normative challenges in positioning the early warning systems and preparedness in the wider context of social change in the coastal societies and communities at risk, and for critical reflection of 'on-the-ground' experiences and lessons learnt. National legal frameworks within member states do not enable them to issue evacuation warnings directly. This is the responsibility of each country, which have varying legal frameworks, technical capacities to forecast potential impacts, and socio-cultural approaches. For example, the ability to create accurate, real-time tsunami warning information through tsunami energy estimates, flooding maps, and tsunami-induced currents, varies across countries, but can be critical in determining potential local impacts. Using whatever information is available and depending on the legal frameworks of a country, the decision on whether to evacuate may be taken at the national or various sub-national levels, sometimes down to local emergency operation centres. There is considerable debate as to which

	level is best able to make such decisions. However, there is a lack of understanding into the approaches of different countries, or their effectiveness. This sandpit proposal seeks to provide a much clearer insight into what is happening at the national and sub-national levels, and the options available h to improve their standard operating procedures. The planned activity will involve an initial detailed study and comparison of coastal based multi hazards and their downstream activities. The results of the study will be presented at the next ICBR Conference and a journal paper and intial briefing report will be prepared. Intial findigns will also be presented at the Inter-Governmental meeting, to inform future policy and capacity development, including its 2019-2021 works programme. This provides an opportunity to achieve significant impact from the work. It is anticipated that the results will lay the foundation for a wider study, for which external funding will be sought.

4. Membership

Sandpit	Group member	Institution
Enhancing disaster resilience education in Asia	Prof Kendra Gotangco	Ateneo De Manila University, Philippines (P13)
	Dr Cris Lopez	Ateneo De Manila University, Philippines (P13)
	Mr Abby Favis	Ateneo De Manila University, Philippines (P13)
	Dr Mario de Leon	De La Salle University Philippines (P12)
	Ms Fathmath Shadiya	Maldives National University, Maldives (P11)
	Ms Maryam Humra	Maldives National University, Maldives (P11)
	Mr Chamal Perera	University of Moratuwa, Sri Lanka (P8)
	Dr Mais Dewo	University Andalas, Indonesia (P10)
Gaps in evacuation planning for coastal communities	Prof. Ranjith Dissanyake	University of Peradeniya, Sri Lanka (P8)
	Dr. Chaminda Bandara	University of Peradeniya, Sri Lanka (P8)
	Dr. Chandana Siriwardana	University of Moratuwa, Sri Lanka (P7)
	Mr Raymond S Rodolfo	De La Salle University Philippines (P12)
	Dr. Seinn Lei Aye	University of Yangon, Myanmar (P15)
	Dr. Lei Lei Aung	Mandalay Technological University, Myanmar (P14)
	Mr Naw Klay Paw	Mandalay Technological University, Myanmar (P14)
	Dr Saw Htet Thura Lin	Mandalay Technological University, Myanmar (P14)
	Mr Gimhan Jayasiri	University of Moratuwa, Sri Lanka (P7)
	Mr Sameera Hippola	University of Peradeniya, Sri Lanka (P8)
	Mr Darshana Jayasooriya	University of Peradeniya, Sri Lanka (P8)
Local government and risk mapping at the local level	Dr Taufika Ophiyandri	University Andalas, Indonesia (P10)
	Francesco Romegliayni	Riga Technical University, Latvia, (P6)
	Prof Abdul Hakam	University Andalas, Indonesia (P10)
	Dr Febrin Ismail	University Andalas, Indonesia (P10)
	Ms Mariyam	Maldives National University, Maldives (P11)
	Prof Day Aung	University of Yangon, Myanmar (P15)
	Dr Marlon Era	De La Salle University Philippines (P12)
	Dr Ezri Hayat	University of Huddersfield, UK (P1)
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