

Capacity Building for Research and Innovation in Disaster Resilience 2019



International collaboration for enhancing research and innovation in the context of disaster resilience

Chamal Perera^{a*}, Champika Liyanage^b, Chandana Siriwardana^a,
Gimhan Jayasiri^a, Chameera Randil^a, Dilanthi Amaratunga^c

^a Department of Civil Engineering, University of Moratuwa, Sri Lanka

^b School of Engineering, University of Central Lancashire, UK

^c Global Disaster Resilience Centre, University of Huddersfield, UK

Corresponding author.

Tel.: +9471 2482872

E-mail address: ra-chamal@uom.lk

Abstract

International Collaboration (IC) is very important for the improvement of resilience of countries to disasters. The rapid growth of science and technology is pivotal in this context to assist the resilience building process through innovation. Especially, when it comes to Asia, IC can assist Higher Education Institutions to carry out research activities that are robust and significant and strive towards research excellence to achieve global recognition. However, the knowledge on levels and issues for collaborative research work in Disaster Risk Reduction (DRR) in the Asian region is limited, which urges the necessity of conducting regional studies to identify possible areas of improvements. This paper aims to fill this gap.

Keywords:

Higher Education Institutions (HEIs); International Collaboration (IC); Disaster Risk Reduction (DRR), Disaster Resilience; Research and Innovation (R&I)

1. Introduction

More than half of the population of the world live in cities and this number is expected to increase up to 70% by 2050 (UNISDR, 2017). With the rapid uncontrolled growth of cities, societies are facing greater threats from disasters. According to UNDP reports, 75% of the population in the world live in areas at least once affected by natural disasters during 1980-2000 (Tarhan, Aydin, & Tecim, 2016). In developing countries like Sri Lanka, when a disaster/ hazard occurs, the impact caused to the communities is high and more time is taken for the recovery process. The resilience of these people is very low and government agencies also do not prioritize vulnerable communities, until something bad happens. Thus, improving the resilience of these communities is very important because it helps in reducing impact and

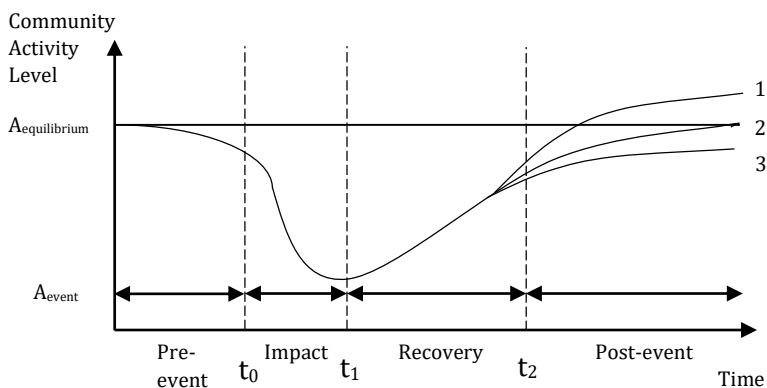


Figure 1. Conceptual depiction of resilience capacity with event occurring at time t_0

societies can rebuild to a better state thereafter.

More resilient societies can be represented as in the curve 1 of graph 1. After impact, even though the level of activities decreases, these societies come back to a better state. Some communities return to the same level after an impact and the community activity level of less resilient societies is represented by curve 3. Thus, the purpose of building resilience must be to achieve what is represented by curve 1.

To build resilience of communities and to achieve the level of curve 1, it is necessary to identify gaps, barriers and the requirement of the

respective regions. This study is based on an ERASMUS+ project titled ASCENT – Advancing Skills Creation for Enhancing Transformation. The findings of the paper are based on a comprehensive literature review and questionnaire survey data. Altogether 382 questionnaire survey responses were collected from academic and research staff from 08 Higher Education Institutions (HEIs) involved in the ASCENT project from Bangladesh, Sri Lanka and Thailand. The questionnaire included questions on level of IC, reasons to pursue IC, benefits of IC and barriers to IC.

2. The object of the study

The objective of this research is to identify gaps in international collaborative research in the context of disaster resilience in HEIs in Bangladesh, Sri Lanka and Thailand and thereby to propose strategies for the development of IC research activities. Further, it is expected to identify current levels of IC, to identify reasons of pursuing IC, to identify benefits from IC, to identify barriers to IC and to identify the government/ institutional support for IC.

3. Methodology

3.1 Research method

The research method used for the study was a survey, using questionnaires as the data collection tool. The questionnaire was developed by a few academics who are involved in the ASCENT project from the University of Central Lancashire, UK and University of Moratuwa Sri Lanka. Then, the questionnaire was sent to chief investigators of the ASCENT Project from the University of Huddersfield, UK. After their comments, the revised version of the questionnaire was used to conduct a pilot study in University of Moratuwa and the survey was refined based on the comments from the participants. This survey was then made available on an online platform of UClan (University of Central Lancashire) and was distributed among academics from 8 universities from Bangladesh, Sri Lankan and Thailand. The universities involved in the survey were 1.) University of Dhaka, Bangladesh, 2.) BRAC University, Bangladesh, 3.) Patuakhali Science and Technology University, Bangladesh, 4.)

University of Moratuwa, Sri Lanka, 5.) University of Colombo, Sri Lanka and 6.) University of Ruhuna Sri Lanka, 7.) Chiang Mai University Thailand and 8.) Naresuan University, Thailand.

The Snowball sampling technique, which is a non-probabilistic sampling method was used when selecting participants for the survey. The survey was available for 3 months and analysis of the results was conducted thereafter. The survey was designed to receive responses in a five-point Likert Scale.

3.2 Tests performed on the data set

3.2.1 Cronbach's alpha test – Reliability and Validity check

This test was performed to check the reliability and validity of the data set as it is important to identify internal consistency of the data set. The overall Cronbach Alpha value of the data set was 0.965 which is close to 1, which indicates that the data set is reliable.

3.2.2 KMO – Bartlett's test

KMO and Bartlett's test was done to check the sample adequacy. The value range for the index is from 0 to 1. As a thumb rule it is accepted that an index over 0.6 is sufficient for a given sample. For this data set, all the values for the KMO – Bartlett's test was above 0.9 which was more than sufficient.

3.3.3 Missing data

A total of 382 academics participated in this survey. The percentages of missing data for each question of the questionnaire were within the acceptable limit which is below 10%.

3.3 Composition of the questionnaire

Out of the participants of the research, 65.4% were males and 30.6% were females. The other respondents did not want to identify with respect to gender in filling the questionnaire. When considering the job titles of academics who were involved in the research, 38% percent were senior lecturers (including 25.4% professors), 48.7% were lecturers and 13.3% were junior researchers.

4. Research Findings

4.1 Current Level of International Collaboration

There are very few initiatives to create international research collaborations in Sri Lanka and the “International Collaboration Research Programme (ICRP)” initiated by the National Science Foundation (NSF), Sri Lanka in 2017 is an example for this. To take part in this programme, a local researcher affiliated to a Sri Lankan University or Research Institute should submit a proposal to the NSF with the involvement of a researcher from a foreign university or a research institution (“International Collaborative Research Programme (ICRP),” 2017). In terms of disaster resilience research, apart from the EU funded ASCENT project and CABARET project, there had not been many projects aiming to develop research in the context of disaster resilience. This is also similar in the Bangladesh and Thailand context. Apart from the involvement with a few EU funded projects, they don’t show much research collaboration in the context of disaster resilience. However joint research collaborations are very important because natural hazards like Tsunamis, Earthquakes and Cyclones can affect multiple regions at the same time.

The first section of the survey attempted to identify the level of IC of the three partner countries and Table 1 reveals the findings.

Table 1. Overall findings related to forms of international collaborations

Form of IC	Bangladesh	Sri Lanka	Thailand	Overall
Participation in international conferences and seminars	3.8	3.5	3.2	3.55
Jointly authoring papers	3.4	3.1	2.8	3.15
Membership of international scientific bodies	3.4	3.1	2.6	3.12
Participation in International Collaborative R & D Projects	3.1	3.1	2.7	3.0
Visiting/Using International research facilities	3.3	2.9	2.6	2.95
Research mobility and capacity development	2.9	2.7	2.6	2.75
Purchasing of research and technological services	2.7	2.4	2.2	2.45

When comparing the overall figures, only the first three criteria show above average values and other aspects are on the lower side. When

comparing scores country wise, it is clearly evident that Bangladesh and Sri Lanka show more international research collaborations than Thailand in every aspect. However, all these three countries need to improve their involvement in aspects 4 to 7. Apart from these findings, the research further highlighted that most academics in these countries are mostly engaged in consultation-based collaborations which are mostly on a short-term basis. Thus, the exposure of researchers to these kinds of collaborations is limited. This is even true in the context of Bangladesh and Thailand. These kind of consultative basis collaborations are mostly linked to leading international scientific bodies, including the World Bank, Asian Development Bank, UN, UNESCO etc. Further, when the involvement of academics in international collaborative research work is considered, majority of their research collaborations are linked with universities and higher education institutes. They show limited involvement in collaboration with public sector establishments, governments & policy makers, research funders, small and medium size businesses and large businesses (Table2).

Table 2. Involvement of the academics in international collaborative research works

Forms of IC	Bangladesh	Sri Lanka	Thailand	Overall
Universities & Other HEIs	3.6	3.6	3.0	3.43
Public sector research establishments	3.0	3.0	2.5	2.84
Government & Policy makers	2.9	2.7	2.2	2.68
Research funders	2.8	2.7	2.4	2.63
Small and Medium Size businesses	2.1	2.2	2.1	2.13
Large businesses	1.9	2.0	1.8	1.89

University-Industry collaborations are very important to encourage knowledge and technological exchange, but unfortunately the findings clearly show that collaborations with industrial organizations are very low in these three countries. In terms of region-wise collaboration levels, most are with South Asian countries and East Asian countries. A moderate level of involvement was identified with European countries, but collaboration is very limited with the American region, Middle East, Russia and Africa.

4.2 Reasons to Pursue International Collaboration

The intentions of different researchers for collaborative research works can vary and the second part of the questionnaire was designed to identify this factor. The outcomes show that most academics engage in collaborative research to pursue excellence in research & innovation and to gain access to the world's major research and innovation facilities. Apart from that, they also show interests in gaining access to global funding, access to global leaders in research and innovation, for personal satisfaction, to strengthen impact and competitiveness and to access strategic partnerships. However, the views of academics further highlighted that they do not seek IC with the motive of promotions, reduced allocated teaching time and financial rewards. In-fact, it is very prudent that intentions of academics are to improve research and innovation and is not centred or based on personal reasons.

4.3 Benefits of International Collaboration

Identifying the aspects beneficial for researchers was done through the third part of the questionnaire survey. From the responses, it was evident that improved access to knowledge and expertise, improving the strength of research collaboration, increased technological capabilities, increasing the robustness of research outputs, improved visibility and reputation, increased rate of innovation, contribution to global societal challenges and improving national competitiveness as the main beneficial aspects. Although the three partner countries do not acquire a great deal of benefits from international collaborative research, the researchers are aware about benefits they can gain from international collaborative research activities.

4.4 Barriers to International Collaborative Research

The researchers were asked to rank the barriers to international collaborative research works and the ranking of all the three countries showed a similarity. The overall ranking is as follows:

- 1.) Financial Issues
- 2.) Lack of resources to support IC
- 3.) Lack of institutional support IC
- 4.) Bureaucratic issues

- 5.) Lack of networking opportunities
- 6.) Finding partners with same research interests
- 7.) Enforcement of intellectual property rights
- 8.) Language Differences
- 9.) Cultural differences

The top three barriers were ranked by most academics of the selected universities. The financial barrier was identified as the most significant as indicated by more than 70% of the researchers. This is clearly evident from the proportion of allocation of the GDP for Research and Innovation in Sri Lanka. This value has been declining and the present allocation level is 0.1%. This is very low compared to other developed countries in the region including Singapore 2.2% (2014), India 0.63% (2015) and Malaysia 1.3% (2015) (“Research and development expenditure (% of GDP),” 2019). The allocation for Research and Innovation in Bangladesh is less than 0.1% (“Research and development expenditure (% of GDP),” n.d.)

4.5 Government/ Institutional Support for International Collaboration

The academics of the three partner countries were of the view that their governments provide reasonable support for training and mobility schemes. However, the support in freeing up time, gaining leave and assistance in networking activities from government institutions is found to be less. On the other hand, the burden on academics related to administrative and paper work in freeing up time for foreign research visits can be seen as a main factor that reduces efficiency. For example, in the case of Sri Lanka, permanent academic members need to gain approval from the ministry to leave the country for foreign collaboration and these processes are time consuming.

5. Discussion and Conclusions

The overall results of the survey show that selected universities from Bangladesh, Sri Lanka and Thailand lack international collaborative research programmes in the DRR sector. This reflects the status of DRR related collaborative research in the respective countries as well. The major issues which impede progress are financial barriers and poor institutional mechanisms. However, these universities hope to get

involved in more international collaborative programs to improve their knowledge capabilities and to stride forward in research and innovation. Collaborative international projects like ASCENT can substantially assist universities to develop their capacities through training programs, workshops, joint publications and mobility schemes.

6. Recommendations

- 1) Government initiatives should be introduced to fund international collaborative research programmes and thereby assistance should be provided for the development of the capacities of academics in respective fields.
- 2) A unit should be established at the ministry of higher education and a dedicated staff should be allocated to assist international research programmes. This initiative should aim to improve the efficiency of the processes by reducing paperwork.
- 3) Incentives should be introduced for academics who are involved in international research programmes and they should be motivated by recognizing their contribution.
- 4) Institutional mechanisms should be enhanced to strengthen international collaborative platforms.
- 5) University mechanisms should be developed to ease University-Industry Collaborations.

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