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## Development of Research and Innovation Capacity Index of HEIs on Disaster Resilience Related Studies

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### Abstract

Research capacity development is one of the most critical challenges facing HEIs in the Asian countries. Growing the number and quality of researchers is a strategic issue. For academia, developing research capacity can help enhance academic fulfilment as well as provide career advancement. The notion that excellent people are a resource to be treasured has led to increased attention being paid to how to attract, support and retain them, thereby building research capacity.

This paper is part of an Erasmus plus co-funded project called ASCENT, which focuses on building the research and innovation capacity (R&I) of Higher Education Institutions (HEI) on disaster resilience related studies. This paper particularly aims at reviewing the current context and gaps in the literature with regards to the indices used to assess the research capacity of the higher education institutions.

Qualitative systematic review approach was adopted at the initial stage, followed by three-round Focus Group Discussion with high-level academics from 14 countries in Asia and Europe. Twenty-one Key Performance Indicators (KPIs) of HEIs Research and Innovation Capacity were identified, which were grouped into three themes: Structure, System, and Policy; Skills and Training; and Staff.

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## 1. Introduction

Research is a powerhouse of knowledge creation. At a time when the world is transformed into what is widely dubbed as the knowledge society, the importance of knowledge creation has become ever more critical and ever more crucial, consequently placing universities at the centre of national development. Countries are striving to raise their global competitiveness through Research and Innovation (R&I) by revamping their higher education system.

Developing countries suffer from a lack of both financial and human resources in R&I [1, 2]. They need to improve their capacity to produce knowledge domestically and absorb the knowledge produced elsewhere. This can happen when human resources are trained in adequate numbers and an institutional framework to carry out R&I activities is created.

Among many communities in the EU and beyond, disasters pose significant concerns and challenges. With growing population and infrastructures, the world's exposure to hazards - of both natural and man-made origin - is increasing. According to UNDP [3], natural disaster events are scattered across the world and strike 75% of the world's area at least once in the last three decades. The geographical distribution of natural disasters has also been unequal, leaving some regions being more vulnerable to disaster than others. In the last three decades, EM-DAT [4] records of the natural disasters for the period of 30 years between 1984 and 2013 shows that Asia experiences the most disasters. The statistical data suggests that the three most destructive natural disasters - storms, earthquakes and flood, frequently occur in the developing countries. In addition to the loss of life, disasters greatly hamper the social- economic capacity of the affected communities.

A major contributory factor to disaster risk is capacity. This capacity needs to be deployed before the hazard visits a community in the form of pre-disaster planning. Effective mitigation and preparedness can greatly reduce the threat posed by hazards of all types. Likewise, capacity can also be deployed following a major disruptive event. The post-disaster response can impact the loss of life while timely reconstruction can minimise the broader economic and social damage that may otherwise result. Global funders and policymakers have increasingly considered as key priorities: the potential of networked models to enhance the impact and efficiency of investments in DR research capacity-building in Asia; the importance of ensuring stronger local ownership of initiatives; and, the importance of building sustainable research institutions. These key priorities are significantly important as strengthening the capacity of developing partner countries to do and use research is widely viewed as vital for meeting long-term innovation in creating disaster resilience societies. Consequently, identifying the R&I capacity development index is argued as one of the most critical exercises towards overcoming challenges facing HEIs in the partner countries, where growing the number and quality of researchers is considered to be a strategic issue.

The aim of the study is to develop a set of Key Performance Indicators for assessing the Research and Innovation (R&I) capacity of Higher Education Institutions (HEIs) in disaster resilience related subjects. The results of qualitative systematic literature review highlight the different dimensions and indicators of research and innovation capacity. It further discusses the use of FGD approach in the process of developing a set of key performance indicators (KPIs) as a tool to assess HEI's research and innovation capacity at the institutional, national and regional level.

## 2. Methodology

The development of the tools adopted a qualitative systematic literature review approach. At this stage, the exercise was focused on the identification of research and innovation capacity indices in the literature. Google Scholar was used as the source of publications, and "innovation capacity index" and "research capacity index" were used as the search keywords. The search results were limited to publication title only by adding "allintitle:" in the keywords and also limited to exclude patents and citation. Publications where full-text were not available or where full text was not in English were also excluded for further analysis.

At the next step, relevant publications was analysed for the objectives, context, and the R&I indices used in the study. Furthermore, using the content analysis technique, each of these publications were further examined to identify measures relevant to the R&I capacity framework. The measures included challenges and enablers of R&I capacity development with regards to policies, infrastructure facilities, and other contexts. Based on their similarities and relevance, the identified measures were linked to the R&I indices; further labelled as Key Performance Indicators

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