EURASIA: Role of Construction Education in Capacity Building for Facilities and Infrastructure Development within a Developing Country Setting

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ABSTRACT:
Natural disasters undoubtedly bring stress to any country be it a developed or a developing country. However, the developing countries generally report significantly higher number of mortalities during a disaster and require much longer time to recover, specifically to re-establish the country's much needed facilities and infrastructures devastated. One reason behind this is the lack of required capacity in respective local governments. While lack of financial capacity may be the most burning issue, lack of intellectual capacity is a major inhibitor specifically towards the implementation post disaster recovery strategies. In the light of this it has been identified that construction education has a major role to play to enhance the country’s capacity required to implement post disaster recovery strategies such as re-establishment of infrastructures and facilities. EURASIA project was implemented to address this need specifically within the post tsunami recovery context in Sri Lanka. Up to date the project managed to create significant impacts on its target groups and partners towards achieving its objectives as discussed in the paper.

Keywords: Disaster Management, Construction in Developing Countries, Capacity Building, Construction Education.
1. BACKGROUND

1.1. Developing countries and disaster recovery

According to the recent “gap report” by RICS (RICS, 2006), 24 out of 49 low-income developing countries face high levels of disaster risk and six are hit by two to eight disasters each year. Furthermore, developing countries experience higher levels of mortality. For example, the earthquake which hit central California in 2003 with a magnitude of 6.5 on the Richter scale, took two lives and injured 40 people. In comparison, the earthquake which hit Iran four days later with a magnitude of 6.6 on the Richter scale, killed over 40,000 people. This mammoth difference in the death toll is not related to population densities, as both events took place in areas with high-density populations (DFID, 2005). Not only do the developing countries experience higher levels of mortality during a disaster, they generally require longer periods for post disaster recovery. Although it is generally accepted that there is always a link between humanitarian actions in immediate rescue/relief programmes and long term recovery and development processes, there is currently no consensus concerning the extent to which humanitarian action should support longer-term needs (ALNAP, 2006).

Long-term recovery, however, has always been identified primarily as a national, sub-national and local government-led matter, making the donors and other organizations work towards humanitarian relief pay lesser attention to this aspect of disaster managements. Not surprising, developing countries often fail to launch successful long term disaster recovery programmes normally due to high financial and intellectual resource demands.

1.2. Post tsunami facilities and infrastructure development needs in Sri Lanka

On 26 December 2004, an earthquake of the West Coast of Northern Sumatra set off a series of other earthquakes lasting for several hours which resulted in a Tsunami in the Indian Ocean. This led to shocking devastation particularly in Sri Lanka, India, the Maldives, Indonesia and Thailand, with damage also in Malaysia, Bangladesh, Somalia, the Seychelles and Kenya. Sri Lanka, the ‘pearl of the Indian Ocean’, generally known as a “safe heaven” with fewer natural disasters, faced one of the worst natural disasters recorded in its history. The Tsunami struck a relatively thin but long coastal area stretching over 1,000 km - two thirds of the country's coastline. At least 40,000 people are known to have died and thousands more are missing (BBC, 2005). It destroyed more than 100,000 houses and the number of homeless people is estimated at between 800,000 and 1,000,000, from a population of nineteen million (UNEP, 2005). The overall damage to Sri Lanka is estimated at $1 billion, with a large proportion of losses concentrated in housing, tourism, fisheries and
transportation (Steele, 2005; ADPC, 2005). Coastal infrastructure, namely roads, railways, power, telecommunications, water supply and fishing ports were also significantly affected. Some of these infrastructure facilities have been continuously used without any significant capacity upgrade for nearly 100 years. For example, the railway network in Sri Lanka has not been extended since it was introduced under the British rule. Moreover, based on a study conducted, the Industrial Development Board of Sri Lanka says micro, small, medium, and large scale industries affected by Tsunami need a minimum Rs. 1.2 billion to re-establish their businesses. This study surveyed 4,389 manufacturing ventures across the island which suggested that the re-establishment of infrastructure facilities such as the road and rail networks and telecommunication facilities may be a major pre-requisite to the re-establishment of their businesses and livelihoods. In fact, the nation’s very recovery from the trauma of the tsunami is very much dependent on the successful and speedy recovery of its facilities and infrastructure base.

As such, even though the immediate priorities of the post-tsunami recovery activities were centred on the provision of basic requirements such as food, shelter and medicines to affected communities, the necessity to recreate public and commercial facilities destroyed during the disaster needs to be considered as a priority when establishing the long term recovery measures (ADPC, 2005).

1.3. Role of construction in post disaster recovery

Although it may not be very significant during immediate relief attempts, construction’s role as an essential part of reconstruction activities following disasters, both natural and human-caused, is well documented. In particular, post-disaster reconstruction has been the subject of a continuous discussion with particular emphasis on the developing countries who are less able to deal with the causes and impacts of disasters [for examples see: Karim, (2004), Lizarralde and Boucher (2004), Nikhileswarananda, (2004), Young, I (2004)]. Thus, the importance of improving the construction industries of the developing nations is widely recognized, highlighting a need to equip them to manage the post-disaster scenario (Ofori, 2002). Construction is typically engaged in a range of critical activities: temporary shelter before and after the disaster; restoration of public services such as hospitals, schools, water supply, power, communications, and environmental infrastructure, and state administration; and, securing income earning opportunities for vulnerable people in the affected areas (World Bank, 2001). Further, there is growing recognition that the engineering community has a valuable role to play in finding and promoting rational, balanced solutions to what remains an unbounded threat (Sevin and Little, 1998) and that the construction industry has a much broader role to anticipate, assess, prevent, prepare, respond and recover from disruptive challenges. Peña-Mora (2004) suggests construction professionals have a key role to play because they
are involved in the construction of the infrastructure, and therefore should also be involved when an event destroys that infrastructure. Specifically, he emphasises that construction engineers possess valuable information about their projects and that information can be critical in disaster preparedness, as well as response and recovery. The information they possess, he argues, may be the difference between life and death. Sevin and Little (1998) further suggest that computerized building plans, structural analysis programmes and damage assessment models may all facilitate rapid rescue and recovery of victims in the aftermath of a disaster, and that these all require the active involvement of the construction professions.

Moreover, the impact of Built Environment related disciplines to the disaster recovery management are not limited to the so-called hard sciences. More managerial and strategic issues such as management of public and commercial infrastructure facilities require a fine mixture of knowledge with regard to the technological and human aspects of Built Environment. Although the knowledge related to these aspects of Built Environment is significantly developed within western and European countries, developing countries such as Sri Lanka do not possess this knowledge at the desired level. Conversely, available built environment knowledge around the world does not reflect adequate coverage required to address the current disaster recovery related issues. For example, despite the fact that the most advanced Facilities Management (FM) curricula is available within Europe today, they often show clear gaps related to specific disaster management issues, which can often be improved through the potential lessons to be learned from current natural disaster related cases such as the Indian Ocean tsunami. To address therefore the current disaster recovery management requirements within a global scale, two mutually beneficial actions are required from the global built environment education point of view. These are: to update the current global body of knowledge in built environment to address the current disaster management recovery issues, possibly learning lessons from current global disaster recovery attempts; and to disseminate the related knowledge globally so that the desired local knowledge is available when and where required.

1.4 Capacity building for post disaster recovery

One of the problems that the governments of developing countries often face in relation to post disaster recovery is their response capacity. Generally, capacity at local government level to plan and implement recovery strategies is usually very limited and often incapacitated as a result of the disaster itself. In view of this, strengthening national capacities for the recovery and reconstruction process including disaster preparedness and long term disaster risk management has been identified as a main strategic objective in United Nations report on post tsunami recovery and reconstruction (UN, 2006).
Strengthening national capacities of developing countries towards post disaster recovery predominantly demands financial incentives. Since the financial incentives provided by donors during a disaster, generally goes towards short term relief efforts rather than for long term recovery programmes, often the governments of affected countries (specifically developing countries) are financially incapable of launching successful recovery programmes. As such, it has been identified within various reports (e.g. RICS, 2006; UN, 2006), that the main focus of the donor organizations should be to achieve the appropriate balance of fund allocations between the immediate/short term relief and the medium/long term recovery. Donor organizations such as UN have recognized this as a timely requirement as a UN publication (UN, 2005) states that while UN system capacities for disaster response and humanitarian assistance are widely recognized and developed, there is currently a vacuum in terms of capacities and accepted system wide mechanisms for post-disaster recovery, particularly those with a risk reduction focus.

While lack of financial ability has been identified as the major contributory factor, lack of appropriate intellectual capacity has also been identified as a major factor hindering the implementation of successful post disaster recovery plans. In this scenario, lack of intellectual capacity refers to lack of expertise and lack of training related to post disaster recovery. With specific reference to post tsunami recovery in Sri Lanka, a report by the Ministry of Disaster Management and Human Rights, Sri Lanka (MDMHR, 2006), stresses that an important aspect of any disaster management is to anticipate the requirements for disaster related public awareness, education and training. The major programmes identified under this theme include increase capacity among key institutions through training of officials and training aids/tools.

Taking the above discussions into context, certain issues emerged as key problem areas which need to be addressed to achieve successful post disaster recoveries, specifically within a developing country setting. With specific reference to post tsunami in Sri Lanka, it is clear from the above discussion that it needs significant development in terms of both its public and commercial sector facilities and infrastructures. However, it has further been identified that Sri Lanka lacks the required capacities (financial and intellectual) to achieve the desired levels of achievement. In the light of this it can be argued that one of the primary requirements for successful post tsunami recovery in Sri Lanka is to build the required intellectual capacity related to facilities and infrastructure development through appropriate enhancement of construction education.

2. THE EURASIA PROJECT

Addressing these requirements on a manageable scale, a European Commission funded international collaborative research project, the
EURopean and ASian Infrastructure Advantage (EURASIA) provides the required basic infrastructure and aims to address these requirements. Five project partners are working in collaboration within this project; three European higher education institutes and two Sri Lankan higher education institutes; namely the University of Moratuwa and the University of Ruhuna. The two Sri Lankan partners are specifically the leading higher education institutions that produce construction specialists for the country. The three European partners are located within United Kingdom, Estonia and Lithuania namely, the University of Salford (United Kingdom), The Tallinn University of Technology (Estonia) and Vilnius Gediminas Technical University (Lithuania). There have been a number of Facilities Management (FM) developments since the early 1990s, with the University of Salford being the leading UK based institution. Over 95% of UK based FM courses are at a Postgraduate level. However, the problem at present is that current UK provision lacks contextual knowledge on facilities and infrastructure management (particularly in association with the natural disasters such as Tsunami) in the South Asian developing economy. Collaboration with Sri Lankan institutions will increase the relevance of such programmes with up to date embedded case studies. Both Sri Lankan partners are located within the tsunami affected areas; one being situated within the worst affected southern province will be able to contribute to the development of case study material in support of the programme. This will be a direct contribution towards support for implementation of capacity building.

2.1 Project aims and objectives

The main aim of the project is to foster cooperation in Higher Education institutions in both Europe and Asia, improve reciprocal understanding of cultures, exchange best practice and strengthen mutual awareness of programmes specifically related to disaster recovery management and capacity building. The specific objective of the project is to enhance the capacity of the partner institutions for training, teaching and research activities required for the creation and long-term management of public and commercial facilities and elements of infrastructure associated with post-tsunami activities in Sri Lanka. The project will achieve this by developing and improving the Sri Lankan and EU’s staff and postgraduate student professional and research skills associated with the creation and management of facilities and infrastructure. This in turn will utilize the teaching experience of the EU University partners to develop a curriculum on the creation and long term management of public and commercial facilities and elements of infrastructure.

The project will also improve and consolidate academic networks by encouraging systematic exchanges so as to establish a sustainable link between EU and Sri Lankan partner Universities. It will develop joint institutional systems and procedures for the provision and monitoring of
training, teaching and research activities associated with the creation and management of facilities and infrastructure; provide career development opportunities to junior staff through postgraduate study and training programmes with partner Universities; and, disseminate knowledge and interpret information through joint publications and by conducting lectures, seminars, workshops and conferences.

2.2 Methodology

This project is designed to be delivered through 7 work packages (WP). Each work package is administered by at least one lead partner, with all partners assuming responsibility for at least one package. The outline objectives of each work package are as follows:

WP1 – Project Management and Evaluation - manages partner roles, coordinates the delivery of project outcomes and, develops and manages infrastructure to: Establish working procedures and reporting structures; Provide management time, administration, co-ordination functions, organize the Steering Committee, progress reports and maintain all records of expenditure; Manage work package activities and deliverables against agreed milestones; and Submit a final report to the funding body and relevant agencies.

WP 2 – Curriculum Assessment, Systems and Procedures - manages the development of a joint curriculum at postgraduate level, and joint institutional systems and procedures, for the provision and monitoring of training, teaching and research activities associated with the creation and long term management of public and commercial facilities and elements of infrastructure.

WP 3 - Module Development - manages the development of a structured database of world-class teaching materials in support of a curriculum on the creation and long term management of public and commercial facilities and elements of infrastructure.

WP 4 – Split-Site PhD Coordination - manages a split-site PhD programme to develop long term human resource capacity in the two Sri Lankan Higher Education institutes. The purpose is to carry forward the joint curriculum and to provide career development opportunities for Sri Lankan Higher Education junior faculty members to follow postgraduate level study in partner institutes.

WP 5 - Training Programme - manages the development and delivery of a training programme on the creation and long term management of public and commercial facilities and elements of infrastructure. The objective is to develop capacity in the Sri Lankan and EU Higher Education institutes to carry forward the joint curriculum and to enhance the skills of educators involved in the delivery of the joint curriculum.

WP 6 - Staff Exchange Coordination - manages academic staff exchanges to provide external perspective in developing a joint curriculum for the creation and long term management of public and commercial
facilities and elements of infrastructure and improve the mobility of teaching and research staff at partner institutions etc.

WP 7 – Dissemination - manages the dissemination of findings to communicate the results of the project, including the joint curriculum, research findings, exemplary strategies and practices.

Figure 1 below illustrates how the work packages integrate with respect to inputs and outcomes, to meet the objectives of the project. For example, the joint outline curriculum to be produced as the outcome of the work package 2 is expected to be an input to the work package 3 which will take the contents of that into consideration when producing the modules and teaching materials as its outcomes.

3. IMPACT TO DATE

It is expected that the outcomes of this project will be beneficial to different groups in different ways and in varying degrees. Groups which are likely to receive the potential benefits of this research are identified as target groups. The impact on each target group is discussed below. In addition, the impact on the project partners has also been discussed.

3.1 Impact on target groups

EURASIA is planned to create human resource capabilities of target groups towards the long term management of public and commercial facilities and elements of infrastructure to ensure the controlled and regulated development of facilities which meet a diversity of needs. It has been planned for these aspects to be achieved mainly by means of
professional skills development through knowledge transfer and exposure to professionally accredited postgraduate education programmes.

Education and knowledge possess power to generate the values and consciousness necessary to overcome many socio cultural issues and problems confronting the humankind today. However, education and knowledge cannot effectively and efficiently combat these issues unless they are understood and the knowledge and experiences shared, when creating the awareness and taking the necessary actions both locally and globally. Hence the need of the day is to create systems and programmes that enable this independent society to learn and act together for a shared future. In this context, this project helps beneficiaries not only to understand the issues and share knowledge but also help communities to mutually benefit. Accordingly, how the project has improved the situation of specific target groups so far are listed below:

Postgraduate students – The main impact on this group is expected through the introduction of the joint curricular for Facilities Management (FM) postgraduate programmes. The development of this joint curricular is expected to be completed in the near future. Once this is fully developed, the students in Sri Lanka will benefit through curricular designed to match their specific requirements. European Union students will benefit through a deeper understanding of Asian FM applications particularly relating to business continuity management following natural disasters, such as tsunamis.

The intention of the project is to provide students from both EU and Asia with a more effective transfer of experience. New programmes and modules will be developed by building on the best practices available within the partnership and based on the live case studies in Sri Lanka with a more practical and international perspectives. The project is highly relevant to students as it provides additional skills and knowledge, and the ability to assess FM within specific contexts. Currently, significant progress has been demonstrated in the light of developing the joint curricular, specifically:

- 18 module specifications were collected from partner institutions to be part of the joint curricular
- The module comparison framework and skills audit frameworks are fully developed and ready to use for the purpose of creating the joint curricular

It is envisaged that the full impact of the project on this target group is to be achieved after the second year of the project, and the project is progressing as planned to achieve that milestone.

Teaching and administrative staff – Staff from partner institutions have benefited during past 12 months from exposure to cross cultural environments, programme development, updated teaching and learning activities and assessment procedures, and the arrangement of split-site PhD training in a related field. The major direct impact on staff during this period was triggered through the staff exchanges, with over 40 staff directly
Researchers – Over 30 researchers from the partner institutions were given access to the Virtual Environment for Built Environment Researchers, a virtual workspace developed as a part of the EURASIA project (http://veber.buhu.salford.ac.uk). This virtual workspace was developed specifically with the Built Environment research needs in mind. This has gone through several evaluation cycles with online user feedback systems. From the most recent evaluation it is clear that VEBER has been serving the researchers as an information hub, actively creating a successful knowledge transfer among the researchers from Asia and Europe. In addition, more than 8 presentations made to date at various international conferences broadening the boundary of these benefits to include appropriate knowledge dissemination to research communities worldwide.

Public and private sector organisations – Project deliverables have been disseminated to additional bodies such as the European Commission, the Royal Institution of Chartered Surveyors (RICS) and the Institute of Engineers Sri Lanka and Institute of Quantity Surveyors Sri Lanka during the last 12 months. These organizations have mainly benefited through knowledge disseminated through the project website, various reports submitted, special discussion sessions and debates organized in various international conferences and special seminar and workshop sessions during staff exchanges.

3.2. The impact on beneficiary and partners

During last few months, the project has created an impact on the Beneficiary and the partners in several ways. From the Asian partner's point of view, the major impact is on their capability enhancements through staff exchanges and modern research infrastructure facilities introduced through the project. With the shared knowledge on Facilities Management from Europe, the Asian partners have laid the foundation to enhance their intellectual capabilities on FM. The impact created by these capability enhancements has created spin-off impacts on matters such as post tsunami recovery in Sri Lanka. With the introduction of the VEBER, the Asian partners could reach world renown research communities which as contributed significantly to diversify their research focus. For example, the Department of Civil and Environmental Engineering has started investigating more managerial issues related to their discipline, whereas prior to the project it was known predominantly for its research on “hard sciences”.

From the European partners’ and the Beneficiary’s point of view, the major impact is based upon the opportunity to interact with different cultural backgrounds and the opportunity to understand the problems of different phenomena of their respective disciplines under different economical, cultural and geographical conditions. During the last year, the development of the module compatibility assessment and the skills audit frameworks
have triggered the opportunity for the above impact, as during that process, different economical, cultural and geographical conditions of the different partners were treated sensitively. Moreover, the staff exchanges have given the European partners the opportunity to experience the nature of the Built Environment related issues in Asia first hand. This has also enhanced the enthusiasm of both European partners and Asian partners to improve research collaborations between two regions creating a regional impact.

3.3. The enhancements of technical and management capacities of partner institutions

Since Sri Lanka is considered a country with a lower rate of natural disasters, it was not equipped with proper national level disaster management strategies at the time of the Tsunami 2004. There are no direct examples of implementation of projects of this nature and scale within Sri Lanka in the recent past. Thus, there were no straightforward mechanisms to assess its capacity or the expertise with relation to this problem. In this context, this project has contributed to improve the managerial capabilities of the direct beneficiaries in Sri Lanka. During the reporting period a solid foundation has been created to develop an understanding of how to manage facilities and associated infrastructure, project risk evaluation, portfolio management, change management and future developments and trends has been transferred from EU to Asia. This foundation has been created largely through the process of the development of the joint curricular and the workshops/seminars organized during the completed staff exchanges.

Conversely, insight into facilities and infrastructure management in the Sri Lankan context, particularly after a major natural disaster, the impact of government and donor legislations, cultural elements, and contingency planning has also started to be transferred from Sri Lanka to EU. This initiative has also triggered largely through the staff exchanges initiated during the reporting period. Undoubtedly, the complete outcome of the above capacity improvements will realise only after the successful completion of the project. However, the progress so far has shown signs of successful project execution with relation to successful partner capacity enhancements.

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5. REFERENCES


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