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# **EURASIA: DEVELOPING A FRAMEWORK TO CREATE A JOINT DISASTER MANAGEMENT CURRICULAR TO ENHANCE EUROPEAN AND ASIAN HIGHER EDUCATION CAPACITIES**

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## **Abstract:**

Poor response capacities related to public and commercial infrastructure and facilities management have been identified as a major inhibit for successful post tsunami recovery attempts in Sri Lanka. Lack of proper knowledge related to disaster management has been identified as a main attribute of the above poor response capacities. Being more specific, none of the Sri Lankan higher education institutions possess a curricular with the ability to produce disaster management expertise within the country. Addressing this issue, European and Asian Infrastructure Advantage (EURASIA) research project has been initiated which aims at developing a mechanism to develop a joint curriculum for Built Environment education through an international collaboration between five European and Asian Built Environment educational institutions. It is anticipated that this international collaboration will enhance the capacities of both the European and Asian partner institutions in their teaching, training and research activities in the Built Environment related disciplines.

## **Keywords:**

Capacity Building, Curriculum Development, Disaster Management, Facilities and Infrastructure Management, Post Disaster Recovery

## **1. Introduction**

On 26<sup>th</sup> December 2006, Sri Lanka, the ‘pearl of the Indian Ocean’, faced one of the worst natural disasters recorded in its history. Morning that day a series of massive sea waves struck a relatively thin but long coastal area of Sri Lanka stretching over 1,000 kilometers - two thirds of the country's coastline creating a Tsunami condition. 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 put 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.

### ***1.1 Disaster Management and the post tsunami Sri Lanka***

The Royal Institution of Chartered Surveyors highlights the fact that, 24 out of 49 low-income developing countries face high levels of disaster risk (RICS, 2006) and they experience higher levels of mortality compared to developed countries in an event of a disaster. Not only the developing countries experience higher levels of mortality during a disaster, they generally require longer periods for post disaster recovery.

Even though the developing countries such as Sri Lanka normally receive financial support and other humanitarian supports from international communities, non governmental organisations and donor agencies as immediate relief aids just after a disaster, generally the long-term recovery has been identified primarily as a national, sub-national and local government-led matter. As such the donors and other organisations work towards humanitarian relieves pay lesser attention to the long term recovery aspect of disaster managements. Thus, not surprisingly, developing countries who witness disasters, fail to launch successful long term disaster recovery programmes especially due to lack of financial and intellectual resources.

During the post disaster investigations, among many other reasons, lack of awareness has been identified as one of the major reason behind the reported mammoth number of loss of lives (Karim, 2005). Indeed, the term “Tsunami” was heard by most of the ordinary Sri Lankans only after this devastation. Thus, undoubtedly, disaster awareness and preparedness are major requirements to prevent immense losses of human lives in future.

The scope of disaster management should continue beyond the pre- disaster stage into immediate relief and long term recovery, should the worst happen again. This demands proper information and knowledge dissemination strategies in Sri Lanka, as this has been highlighted as one of the reasons behind unsuccessful post-Tsunami recovery activities. This pit-fall is not unique to Sri Lanka, but visible within many of the developing country settings. Supporting this, Banerjee(2005) highlights lack of prior knowledge and proper point of references have made most of the recovery plans guessing games, eventually failing without adding appropriate values to the recovery attempts.

## **2. Educational Capacity Building for successful Disaster Management**

After 2 years, Sri Lanka is still to recover from the devastation triggered through the December 2004 tsunami. UNDP report (2005) highlights the factors such as pre-existence of very high densities of unplanned settlements in the Southern part of Sri Lanka as influential factors for the operation of the rehabilitation programs. Add to this, the post-Tsunami rehabilitation operations have been affected due to the lack of response capacities in local government institutions to address the needs of such a magnitude. This is mainly due to the fact that, before the Tsunami, Sri Lanka was known to be a safe haven where outrages of nature scarcely occurred and the strategic and operational level capacities of the institutions responsible for public and commercial facilities were not expected to cater for a devastation of this nature or the scale. As such it has been identified that the capacities of relevant authorities in Sri Lanka need to be improved to launch successful post tsunami recovery programmes and to face any future challenges of the same nature (UNESCO, 2005; ADPC, 2005). As identified by Lagcao (2003), the primary goal of capacity building is to increase an organization's access to information and technical know-how by improving internal management structures, processes and procedures, as well as strengthening partnerships among the various players in the development process. Accordingly, within the context of post – tsunami recovery in Sri Lanka, the aim of providing access to information and technical know-how to the authorities responsible for public and commercial infrastructures, largely resides within the capacity and capability of Higher Education (HE) institutions in Sri Lanka.

Moreover, in order to achieve the desired capacity and the expertise for the re-creation, long term maintenance and management of public and commercial facilities; teaching, training and research related to the discipline will have to be strengthened within the country. While teaching and training sessions can be more appropriate in developing the required capacities in short term, development of a proper research base within the country is required to establish the capacity to ensure successful maintenance and management of these facilities continuously within the country. Thus, from an academic point of view, the post tsunami rehabilitation in Sri Lanka demands an established academic knowledgebase in facilities and infrastructure management.

However, within Sri Lanka, there are no universities with postgraduate degree programmes offering courses within this discipline. Despite the increasing recognition of the importance of establishing facilities management (FM) as an important knowledge area, it has been identified that the higher education institutions in Sri Lanka do not have the required capacities in delivering training, teaching and research extensively in the area of FM in terms of initial local expertise and knowledge. Thus, there is a clear and timely requirement to enhance

the capacities and research profiles of Sri Lankan HE institutes to support recreation and long term maintenance of the public and commercial facilities, and related infrastructure through the external (foreign) facilities management expertise.

Moreover, the application of direct foreign knowledge within the given context is not appropriate as there may be mismatches in knowledge application within the Sri Lankan context due to some influential country specific characteristics such as economic condition, government policies and cultural sensitivity. Thus, it is important to make sure that the capacity building related to the facilities management discipline in Sri Lanka is an attempt to use the foreign knowledge on the subject matter to create appropriate knowledge to suite the values, requirements and demands of Sri Lanka.

On the other hand, the current global infrastructure and facilities management knowledge does not reflect adequate coverage required to address the current disaster recovery related issues. As an example, despite the fact that the most advanced Facilities Management (FM) curricula is available within the Europe today, those often show clear gaps related to specific disaster management issues. It is apparent that these gaps can be improved through the potential current natural disaster related cases such as the Indian Ocean tsunami. In context, to address 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. Those are; firstly, to update the current global body of knowledge in built environment to address the current disaster management recovery issues, possibly by learning lessons from current global disaster recovery attempts such and to disseminate the related knowledge globally so that the desired local knowledge is available when and where required. Secondly, to disseminate currently available knowledge in appropriate form to the areas in need such as to the counties affected by the recent disasters.

### **3. The EURASIA project**

The EUROpean and ASian Infrastrucuture Advantage (EURASIA) is an international collaborative research project with the specific aim of addressing the above highlighted requirement. Five project partners are working in collaboration within this project; three European higher education institutes and two Sri Lankan higher education institutes. The two Sri Lankan partners are specifically the leading higher education institutions that produce construction specialists for the country; namely the University of Moratuwa and the University of Ruhuna. 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 respectively. There have been a number of 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.

In addition to the benefit to the Asian partners, this collaboration is beneficial for the European partners creating a vital win – win situation.

### ***3.1 Project Aims and Objectives***

Addressing the above highlighted problems and requirements, the EURASIA project sets out its aims and objectives as follows; the project aims 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 infrastructure. It will target (direct) postgraduate students, and junior and senior faculty members from the EU and Sri Lankan partner institutions and (indirect) researchers, other public sector organisations, consultancies and industry. Thus, in addition to the specific requirement of capacity building within the post tsunami rehabilitation setting in Sri Lanka, the project aims at addressing the facilities management related capacity building requirements within the European Union.

The overall objective 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.

The project will achieve this by: developing and improving the Sri Lankan and EU's staff and postgraduate students' professional and research skills associated with the creation and management of facilities and infrastructure, with a clear provision for ensuring equal opportunities and equitable participation of different genders; utilising 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; improving and consolidating academic networks by encouraging systematic exchanges so as to establish a sustainable link between EU and Sri Lankan partner Universities; developing 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; providing career development opportunities to junior staff through postgraduate study and training programmes with partner Universities; and, disseminating knowledge and interpreting information through joint publications and by conducting lectures, seminars, workshops and conferences.

### **3.2 Methodology**

This overall methodology for this project based on 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. However, partners are encouraged to participate in each of the work packages.

WP1 is responsible for administering the project. All other work packages report progress to WP1, which coordinates work packages and monitors overall progress of the project against objectives, and reports to the Commission. WP2 is primarily responsible for developing a joint outline curriculum on the creation and long term management of public and commercial facilities and elements of infrastructure, which forms the basis for the activities of the Module Development work package (WP3). WP3 is to develop module specifications and associated teaching materials in support of the joint outline curriculum. Work packages 4, 5 and 6 are concerned with developing the human resource capacity of partner Institutions in order that they can support and deliver the new curriculum. These three work packages will focus on addressing the skill requirements and research gaps identified in WP2. WP5 is concerned with developing the skill base of teaching and research staff, and WP6 will expose staff to different cultural working environments and facilitate exchange of working practices and knowledge between partner Institutions. In this sense, WP5 and WP6 aim to develop the human resources capacity to deliver the new curriculum. WP4 aims to develop longer term capacity in the two Sri Lankan Higher Education Institutes. It focuses on developing two junior members of staff from Sri Lanka, specifically in relation to their research skills. Their studies will focus on specific research gaps in the creation and long term management of public and commercial facilities and elements of infrastructure. The research undertaken and skills developed during the studies will help to develop the curriculum after the project. WP7 is responsible for widening the impact of the project beyond the partner Institutions, thus ensuring that other Asian and EU institutions, as well as industry and relevant bodies, can benefit from the work undertaken. Under WP7, the project will culminate in an International Conference in Sri Lanka that is targeted at academics, industrialists and policy makers concerned with the creation and

long term management of public and commercial facilities and elements of infrastructure.

#### **4. Development of the joint Curriculum**

As identified in the previous section, one of the major tasks of the EURASIA project is to develop a joint curriculum related to facilities and infrastructure management compiling the existing European knowledge in the subject area with current case materials from the post Tsunami recovery scenarios in Sri Lanka. The joint curriculum is expected to share among both European and Sri Lankan partners and expected to adopt it to suit the localised needs. The rest of this paper discusses the applied methodology to carry out this task with the intention of evaluating its appropriateness and the academic rigor.

##### ***4.1 The Curriculum Development Methodology***

The biggest challenge of developing the joint curriculum was to achieve the required standards and still keep it flexible to suite individual needs of all the potential participants. The EURASIA approach to address this need was to identify and address the above aspects of the curriculum within key parameters of the development process. The overall joint curriculum development process can be illustrated as follows.



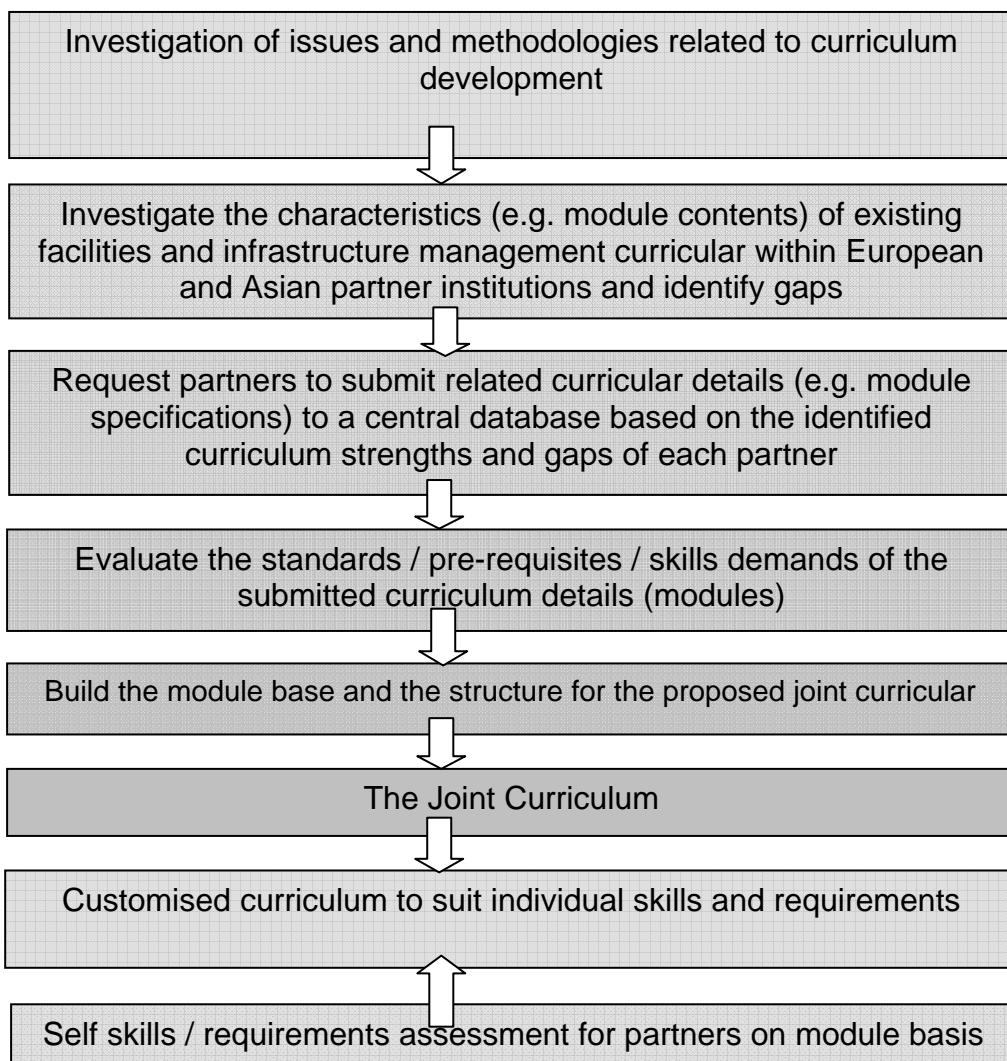


Figure 1 - The joint curriculum development process

#### ***4.2 Issues and characteristics of joint curriculum development***

The first step of the process was to investigate the issues and methodologies related to the curriculum development. The main focus of this stage was to explore existing literature related to the subject. The scope of this search was determined by the scope of the problem and the scope under which the EURASIA project is operating. As such the literature search was particularly aiming at the curriculum development methodologies and issues at post graduate level. The search was further refined to capture details related to the joint curriculum development related to the following subject themes.

- Built Environment
- Disaster management
- Facilities and Infrastructure management

A detailed analysis about this literature review is in preparation to be published elsewhere and is beyond the scope of this paper. However, through the above search followings have been identified as issues and characteristics related to the joint curriculum development.

1. There is a tendency that the final outcome of the process to be a generic and imbalanced curriculum due to the fact that, it has been designed to cater for different objectives and needs of different participants.
2. The curriculum needs to be flexible enough to cater for different market, quality and skills requirements or different participants.

#### ***4.3 Development of the modules base***

During the next stage of the curriculum development the focus was mainly on the module structure and the content proposal. The approach was to first investigate the module structure of the existing facilities and infrastructure curricular within European and Asian partner higher education institutions. As mentioned earlier, the Sri Lankan higher education institutions did not have any direct examples of facilities and infrastructure management curricular within their institutions at postgraduate level. However, there were very strong examples of built environment curricular available at these institutions. Moreover, at these institutions, both managerial and engineering disciplines related curricular were present with some indirectly related modules to the infrastructure and facilities management disciplines.

From the European partner's point of view, there were number direct examples of facilities and infrastructure curricular being taught at the partner higher education institutions. However, as mentioned before, the contents of these are conventional and show lack of up to date research knowledge to cater for modern world needs.

As the next step of the process, all the partners were asked submit any appropriate module specifications that they may have at the time to a central module base. This module base is actually an electronic work space created through a virtual research environment (VRE). This VRE has also been developed as a part of the EURASIA project and is known as VEBER – Virtual Environment for Built Environment Research. (This VRE is accessible via the following URL: <http://veber.buhu.salford.ac.uk>).

#### ***4.4 Standardising the module base***

The next challenge of the curriculum development process was to bring the collected modules to a uniform comparable standard. For this purpose, as a part of the EURASIA project a module compatibility framework was developed. The basic premise of this framework is to evaluate each module submitted to the module by using a common toolset. During the process of this framework development, six key areas were identified as main parameters within which the modules should be evaluated. Those are;

- Relevance
- Innovation
- Flexibility
- Interactivity
- Language
- Quality

As the outcome of this process a tool was developed to measure the compatibility of each module submitted. The tool is basically a questionnaire with a Liker Scale. It consists of 14 questions to test the above 6 parameters of the modules within the module base. This questionnaire was made available within VEBER and each time a when a partner submits a module to the module base this questionnaire will have to be filled and a compatibility assessment is done. This in effect is the mechanism to create the module base for the joint curricular.

#### ***4.5 The skills and requirement audit***

During the development of the module compatibility assessment framework, it has been realised that the skills of individual partner organisations have a major impact upon the success of the joint curriculum. The skills differ from organisation to organisation, so as the compatibility of the curriculum within the individual setting. The figure 2 illustrates this link.

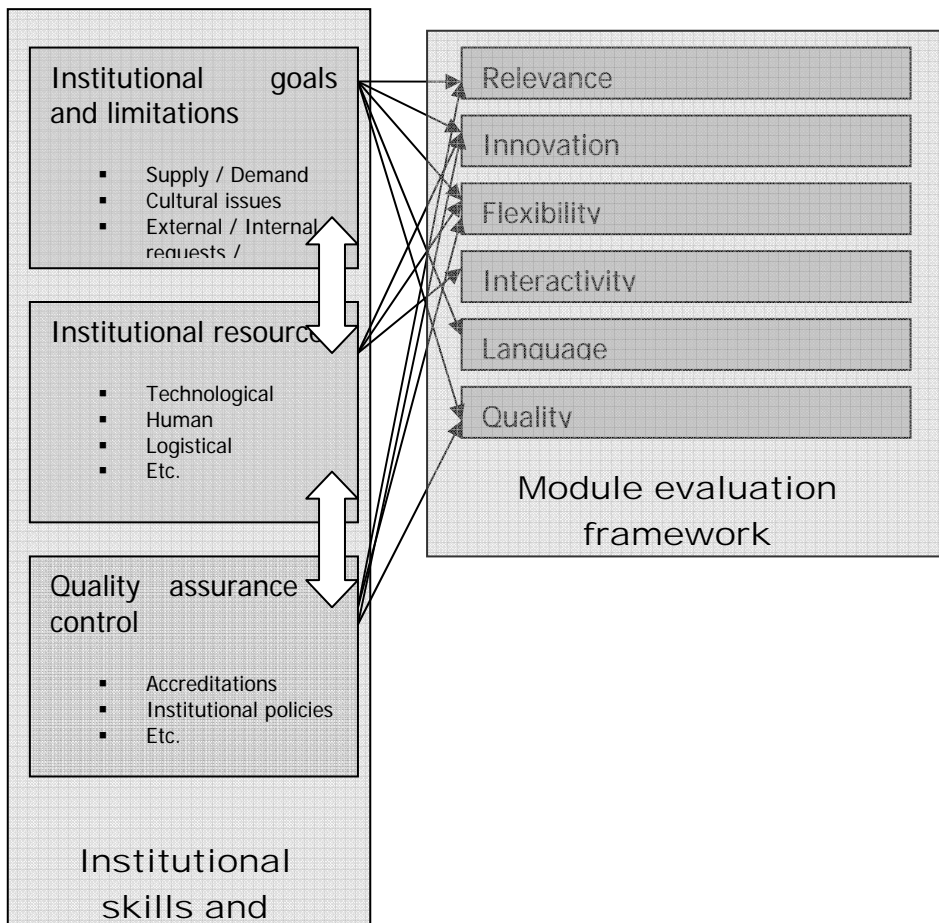


Figure 2 - The Link between the curriculum compatibility and the institutional skills and requirements

With the identifications of the above links, the need for auditing the skills and requirements of the partner institution has been realised. For this purpose, a skills audit framework has been developed within the EURASIA project. This framework again presented in VEBER as a questionnaire with ten questions with a Liker Scale.

#### 4.6 Curriculum customisation

As identified above the institutional requirements and skills differ from a partner to another. This reality defeats the whole purpose of developing a joint curricular if that is to be taken in its literal meaning. Due to this reason, the dissemination of the developed joint curricular takes an innovative approach with the context of the EURASIA project. Rather than forcing all the partner institutions to use a uniform

curricular, the EURASIA encourages to build a custom curriculum to each partner based on their skills and requirements, by selecting different combinations of modules from the module base. The module compatibility assessment framework and the skills assessment framework in combination provide the appropriate tools to make this process feasible. However, unlike with the module compatibility assessment framework, the skills and the requirements audit has been planned to be carried out during the module requisition stage, so that at the time of building the custom curricular, each institution can test each module against the actual skills and the requirements of the institution.

#### ***4.7 Current situation and the conclusion***

The EURASIA is now in its second year and development of the joint curriculum is ongoing. However, the methodology for developing the joint curriculum is fully developed and finalised. This methodology development process provided the basis for this paper.

At present the module base for the joint curriculum is being built by collecting appropriate modules from the partners. So far more than twenty modules were submitted and have gone through the module compatibility assessment process. Module customisation process is the next planned step of the joint curriculum development process. The actual implementation of the customised modules within individual institutions is beyond the scope of the project, however it is the aim of the EURASIA to ensure the joint curricular is ready for the practical implementation at the end of the project duration.

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#### **References:**

- ADPC (2005) Report on Post Tsunami Rapid Assessment in Sri Lanka, ADPC, Bangkok Thailand
- BBC(2005)[online]<http://news.bbc.co.uk/1/hi/world/asia-pacific/4126019.stm>
- [http://www.undp.org/bcpr/disred/documents/tsunami/srilanka/pt\\_recovery\\_strategy.pdf](http://www.undp.org/bcpr/disred/documents/tsunami/srilanka/pt_recovery_strategy.pdf) Accessed: 27/12/2006
- Karim, N (2004) Options for Floods and Drought Preparedness in Bangladesh. Proceedings of the Second International Conference on Post-disaster reconstruction: Planning for Reconstruction, 22-23 April 2004, Coventry University, UK.

- Lizarralde, G. and Boucher, M. (2004) Learning from post-disaster reconstruction for pre-disaster planning. Proceedings of the Second International Conference on Post-disaster reconstruction: Planning for Reconstruction, 22-23 April 2004, Coventry University, UK.
- NEIC (2003) U.S. Geological Survey, National Earthquake Information Center World Data Center for Seismology, Denver [online] [http://neic.usgs.gov/neis/eq\\_depot/2003/eq\\_031222/](http://neic.usgs.gov/neis/eq_depot/2003/eq_031222/), <http://earthquake.usgs.gov/eqcenter/eqinthenews/2003/uscvad/> <http://www.earthquakeadvisor.com/articles/00069.html> Accessed: 27/12/2006
- Nikhileswarananda, S. (2004) Post Disaster Reconstruction work in Gujarat on behalf of Ramakrishna Mission. Proceedings of the Second International Conference on Post-disaster reconstruction: Planning for Reconstruction, 22-23 April 2004, Coventry University, UK.
- Ofori, G. (2002) Developing the construction industry to prevent and respond to disasters. Proceedings of the First International Conference on Post-disaster reconstruction: Improving post-disaster reconstruction in developing countries, 23- 25 May 2002, Universite de Montreal, Canada.
- Pena-Mora, W. (2005) Collaborative First Response to Disasters Involving Critical Physical Infrastructure. O'Neal Faculty Scholar Seminar from University of Illinois, September 19, 2005.
- RICS(2006), Mind the Gap! Post-disaster reconstruction and the transition from humanitarian relief, Royal institution of Chartered Surveyors
- Sevin, E and Little, R. (1998) Mitigating Terrorist Hazards. The Bridge, 28(3), Fall. Tobin
- Steele, P (2005) Phoenix from the Ashes? Economic Policy Challenges and Opportunities for Post-Tsunami Sri Lanka. Research Studies: Working Paper N0.7. April 2005. Institute of Policy Studies, Colombo, Sri Lanka
- UNEP (2005) Natural Rapid Environmental Assessment – Sri Lanka, UNEP Sri Lanka Country Report – 2005
- UNDP (2005) Post-Tsunami Recovery and Reconstruction Strategy, United Nations Development Programme
- World Bank (2001). World Bank and Asian Development Bank Complete Preliminary Gujarat Earthquake Damage Assessment and Recovery Plan. [online] <http://www.worldbank.org/gujarat>; <http://www.adb.org/>. Accessed: 01/01/2007
- Young, I (2004) Monserrat: Post Volcano Reconstruction and Rehabilitation – A Case Study. Proceedings of the Second International Conference on Post-disaster reconstruction: Planning for Reconstruction, 22-23 April 2004, Coventry University, UK.