



University of HUDDERSFIELD

University of Huddersfield Repository

Malalgoda, Chamindi and Amaratunga, Dilanthi

A disaster resilient built environment in urban cities

Original Citation

Malalgoda, Chamindi and Amaratunga, Dilanthi (2015) A disaster resilient built environment in urban cities. *International Journal of Disaster Resilience in the Built Environment*, 6 (1). pp. 102-116. ISSN 1759-5908

This version is available at <http://eprints.hud.ac.uk/id/eprint/27101/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

A disaster resilient built environment in urban cities: the need to empower local governments

Structured Abstract:

Purpose: Disasters make a huge impact on the built environment. In turn, failure of the built environment can create significant impacts on social and economic activities. Thus, when moving towards safer cities, it is important to develop the built environment in such a way that it can withstand threats posed by natural disasters. Various stakeholders need to get involved in the process of making a disaster resilient built environment, out of which the local governments need to play a critical role, as they are the closest government body to the local community. However, local governments are facing a number of challenges in responding to city resilience activities. This research aims at making recommendations to empower the Sri Lankan local governments in creating a disaster resilient built environment.

Design/ methodology/ approach: The research adopts case studies as its research strategy and investigates three cities in Sri Lanka which are potentially vulnerable to disasters. A number of expert interviews have also been conducted to supplement the case study findings.

Findings: The paper presents the challenges faced by the Sri Lankan municipalities in creating a disaster resilient built environment and provides recommendations to empower municipalities to effectively contribute to city resilience. The paper suggests amending policies related to establishment of municipal councils and disaster management in order to provide more authoritative powers for municipalities to effectively engage in city resilience building. Findings also revealed the importance of addressing financial and human resource issues, which were the main drivers of hindrance. Furthermore, all relevant urban development plans, risk maps, disaster resilient planning, construction and operation guidelines and resilient land use practices need to be integrated into existing planning and building regulations, and proper monitoring and control mechanisms have to be established to ensure compliance with the regulations. In doing so, it is important to raise awareness of council officials of disaster risks and resilient practices by way of organising educational programmes such as seminars and workshops. It is also suggested that municipal officials should be involved in national level decision making with regard to their local areas and to establish proper communication channels to exchange decision and information related to city resilience.

Research limitations/ implications: The paper is based on case studies in three cities and a number of expert interviews, which are limited to the Sri Lankan context. Inputs from other cities from developed countries may further validate the recommendations.

Originality/ Value: The paper highlights the challenges faced by the local governments in creating a disaster resilient built environment within Sri Lankan cities and provides recommendations as to

how the local governments could be empowered in creating a disaster resilient built environment within cities.

Keywords: Empowerment, Local governments, Natural disasters, Built environment, Sri Lanka, Cities.

Article Classification: Research Paper

1 Introduction

Sri Lanka is a developing country experiencing severe impacts of natural disasters caused by coastal erosion, droughts, floods, landslides, lightning, sea level rise, storm surge, tropical cyclones and tsunamis. During 2013, approximately 500,000 people were affected due to various natural disasters, out of which 90% was due to floods (DMC, 2014). Strong winds were the second highest impact during 2013 where over 400 houses were totally destroyed and over 8800 houses partially damaged (DMC, 2014). While investigating the disaster occurrences during the past decade, it is evident that the country is increasingly susceptible to various natural disasters, which require a coordinated approach in attaining disaster resilience in all development activities. With the current trend of urbanisation, it is expected that 50% of country's population will live in urban local authorities by 2020 (UN-Habitat, no date). The country is urbanising rapidly and heavy concentrations of human settlements have been observed in urban areas, especially in some of the urban coastal areas (Climate Change Secretariat, 2010). Urbanisation has created a series of linked issues such as environmental problems due to the increasing need of basic resources, over extraction of natural resources, wetland reclamation, pollution, etc. The occurrence of flooding has increased in the country due to the loss of flood retention areas and poor drainage systems in most of the areas (Climate Change Secretariat, 2010). An increased demand for land in cities led to settlements in hazard-prone areas such as flood plains and sloping lands, all of which increase the risk of disasters. A growing urban population and increasing population densities have therefore increased the risk of disasters in urban cities of Sri Lanka. Furthermore, a majority of the country's economic activities are taking place in urban areas and are not distributed geographically, making the country more vulnerable to disasters. For example, in 2009 the manufacturing, construction, and services sectors, which are primarily urban-based, accounted for 83.3% of GDP (Climate Change Secretariat, 2010). All these have resulted in a very strong need to increase the resilience of urban cities and making them resilient to natural disasters.

Built environment is a core component in every city, which facilitates the everyday life of human beings. Any disruption to the built environment would disturb the proper functioning of the society, and the economic and social development of the country (Malalgoda et al, 2013). Recent disasters in Sri Lanka have highlighted the vulnerability of the built environment and the lack of proactive measures for the mitigation of disasters. Unsafe buildings and infrastructure in the country further aggravate the risk of disasters and therefore, when making cities resilient it is very important to provide the built environment with an effective degree of resilience which can withstand the threats

posed by natural hazards. In this context, building a disaster resilient built environment in urban Sri Lankan cities has become an important research area, which requires serious attention in research and policy.

Effective implementation of disaster risk reduction is a multi-disciplinary and multi-sectoral mission (Haigh and Amaratunga, 2010), which requires collaboration of a large number of stakeholders. Some of the main stakeholder groups include three spheres of governance (national, provincial and local), the private sector, civil society, non-governmental organisations, community-based organisations, research institutions and institutions of higher learning (Niekerk, 2007). Out of these stakeholder groups, local governments have been identified as a key stakeholder in the process of making a disaster resilient city as they are the main governing body rooted at the local level, where disasters happen (Bendimerad, 2003; MacManus and Caruson, 2006; Kusumasari et al., 2010; Manyena, 2006; UN-ISDR, 2010; Malalgoda et al, 2013). Moreover in Sri Lanka, local governments are the primary agency in the country, involved in providing planning approval for new buildings, alterations and enlargement of existing buildings, changes of use of buildings and changes of land use (Malalgoda et al, 2013). As such, local governments are expected to play a major role in developing a disaster resilient built environment in the country. However, the inadequate contribution of local governments towards implementing disaster risk reduction initiatives has been highlighted on numerous occasions. This emphasises the need to develop the capacity of local governments in order to implement proper disaster risk reduction. It is important to identify the challenges faced by the local governments when implementing disaster risk reduction initiatives and to understand how local governments could be empowered to ensure successful implementation of disaster risk reduction initiatives at the local level. Consequently, this research set out to recommend the ways and means of empowering Sri Lankan local governments to create a disaster resilient built environment within cities under their jurisdiction. The paper provides evidence on how Sri Lankan local governments implement risk reduction actions and discusses the ways of providing an enabling environment for local DRR and resilience. The paper proposes the ways and means of overcoming existing challenges, and provides recommendations as to how the local governments could be empowered in facilitating city resilience-building initiatives in the built environment context.

2 The role of local governments in creating a disaster resilient built environment

Local government is the state administration that is closest to the local population and therefore can play a vital role in initiating disaster risk reduction within their local areas. In practice, local governments are facing a number of challenges when contributing to city resilience. Before going through the local government's role in disaster resilience and associated challenges, it is important to understand the formation of Sri Lankan local governments.

2.1 Introduction to the Sri Lankan local government system

Sri Lanka is a unitary democratic republic with three levels of government: central, provincial and local. Accordingly, there are nine second-tier provinces and 335 third-tier local governments including 23 Municipal Councils, 40 Urban Councils and 272 Pradeshiya Sabhas (Marga Institute, 2011). These local authorities function under their respective Ordinances and Acts, namely; the Municipal Councils Ordinance No. 16 of 1947 and the Urban Councils Ordinance No. 61 of 1939, both of which have been revised and re-printed incorporating amendments made in 1987, and the Pradeshiya Sabhas Act No. 15 of 1987. Presently, the supervision and administration of local governments are devolved to provincial councils, which have been incorporated under the Provincial Councils Act of 1987. However, the constitution, form and structure of local authorities are to be determined by law under the 13th Amendment to the Constitution (Leitan, 2010). Thus, for the first time, local governments have received constitutional recognition and powers under the 13th Amendment to the Constitution (1987) and as such local governments are autonomous statutory bodies with their constitution, powers and duties defined in their respective Ordinances and Acts (Marga Institute, 2011).

Municipal councils, urban councils and Pradeshiya Sabhas are responsible for the regulation and control of, and all matters relating to, public health and sanitation, public utility services and public thoroughfares, and generally with the protection and promotion of the comfort, convenience and welfare of the people and the provision of amenities. The extents to which these functions are performed vary in accordance with their financial and other capabilities (Leitan, 2010). Local governments are responsible for the collection of taxes and other fees, which must be levied within the limits prescribed by the central government. Local governments are permitted to maintain a fund from which it is legally empowered to make withdrawals. The local fund normally consists of: all rates, taxes, duties, fees and other charges levied by the local authority, all fines levied and penalties recovered, stamp duties and fees specified in Ordinances/Act, all sums realised by sales, leases or other transactions of the local government, all revenue derived from property vested in the local government or by the administration of any public services, all funds and revenues appropriated or transferred to the local authority by parliament and/or all grants allocated to the local authority (Marga Institute, 2011). Based on the above, the sources of revenue of local governments can be broadly categorised under local taxation, grants from central government and loans.

In general, municipal councils enjoy more powers than urban councils and Pradeshiya Sabhas and are based in more urban cities of the country. Generally municipal councils are for cities and large towns, urban councils for less urbanised areas and Pradeshiya Sabhas for rural areas. Therefore, municipal councils are the premier form of local government institutions in the country, each of which is led by a full-time mayor who is nominated by the leading party and appointed by the Commissioner of Elections. The mayor is the chief executive of the council and is usually supported by the deputy mayor and a commissioner. The councillors are elected for 4 years by the voters of the respective areas on the basis of proportional representation.

The next section will explore the role of the local governments in creating a disaster resilient built environment in urban cities of the country.

2.2 Role of the local government in creating a disaster resilient built environment

In Sri Lanka, there are a number of governmental organisations responsible for the design, development and maintenance of the built environment. Urban planning of the country functions in close collaboration with various agencies under different government ministries. All these government institutions have to play a role in the city's resilience-building. Some of the main institutions include the Urban Development Authority, the National Physical Planning Department, the Irrigation Department, the Coast Conservation Department, the Central Environment Authority, the Disaster Management Centre, the National Building Research Organisation, the Road Development Authority, Provincial Councils, and Local Governments. Within this system, local government is not considered as a level of government that can administer development functions as many of the country's development activities are carried out through central government agencies and provincial councils. However, local governments are the primary agency in the country involved in providing planning approval for new buildings, alterations and extensions to existing buildings, changes to use of buildings and changes of land use. As such local governments are empowered with regulatory and legislative enactments on land-use planning and control of development activities. Local governments are therefore in a better position to ensure that the new developments are in line with the city's resilience-building activities and are safe for human settlements. They are also better placed to handle many functions that contribute to creating a disaster resilient built environment although the law does not adequately delegate the required responsibility.

Most of the disaster management functions in Sri Lanka are centrally coordinated by the Disaster Management Centre (DMC). Each district has a district level coordinator to coordinate disaster management activities within the district. All districts in Sri Lanka are divided into administrative sub-units known as divisional secretariats (DS). Each DS division is again divided into a number of "Grama Niladari" divisions. The Disaster Management District Coordinating Office of each district coordinates all disaster management activities through these DS and "Grama Niladari" divisions. As such the involvement of local governments in disaster related issues is somewhat low, and poor coordination between these two institutions has also been observed.

None of the local government ordinances or Acts explicitly recognises disaster management as a subject for local governments. Although the local government ordinances and Acts contains sections that can be used or interpreted as related to disaster management measures, the country's Disaster Management Act has not delegated adequate legislative power to local governments (NBRO, 2009). Nevertheless, in the gazette notification published in 2009 regarding the National Policy for Local Government Disaster Risk Reduction, a number of sections have been included, which can be seen as the first step towards bringing local governments into disaster risk reduction activities. Despite many challenges, a number of local governments are now working closely in making their city resilient to disasters. As of April 2014, 47 local governments have registered as participating cities

for the UN-ISDR campaign on making cities resilient – my city is getting ready (UN-ISDR, 2014a). Some local governments have made significant contributions in moving towards DRR. For example, Batticaloa municipal council has established a Disaster Risk Reduction Unit within the council with the support of an Australian funded project implemented by UN-Habitat (Un-Habitat, 2013). This could be identified as a key milestone in the process of resilience-building.

3 Research methodology

In order to address the research aim, three case studies were conducted within Sri Lanka, each based on a different geographical area within the country. As indicated previously, municipal councils are the premier form of local governments and are based in most urbanised cities of the country. Since the focus of the paper is on urban cities, the research will consider all areas governed by municipal councils as urban cities. On that basis, three municipal council areas were selected for the study: Batticaloa, Galle and Kandy municipal council areas. These cities were selected based on the judgement of the researcher, together with the opinion of other experts. All three are cities that have been badly affected by disasters and which are vulnerable to future disasters.

Within the case studies, a large number of interviews were conducted to gather valid and reliable data relevant to the area of the study. The interviews were designed to capture the city's resilience to disasters and to understand the commitment of the local government in making the city resilient to disasters, and associated problems. As such, the data were gathered through semi-structured interviews with the local and other government officials, policy makers, industry practitioners and experts who are engaged in the respective areas of study. In addition, a series of expert interviews were also conducted with the experts in the field of study with the goal of gaining background knowledge pertaining to this field of study. These interviews were mainly designed to acquire knowledge on current practice towards initiating disaster risk reduction initiatives within Sri Lanka, the role of municipal councils in creating a disaster resilient built environment, associated challenges and ways of empowering municipal councils to provide an effective contribution towards city resilience. The main idea behind conducting expert interviews was to reduce the biasness in data sources, and to increase the validity and the reliability of the research conclusions by way of triangulating multiple sources of data and multiple methods of data collection. In the same way, government and other publications related to the establishment of local governments, their structure and other administrative and funding arrangements were studied to get an in-depth idea about the cases to be observed.

4 Findings and discussion

Data gathered through case studies and expert interviews highlighted the poor involvement of municipal councils in contributing to city resilient building activities. Major constraints underpinning this poor involvement are discussed below.

4.1 Challenges for municipal councils

Primary data revealed that a lack of authority is a major constraint for Sri Lankan municipal councils in contributing to city resilience. The Municipal Council Ordinance has not explicitly recognised disaster management as a subject for municipal councils. However, there are certain sections within the council ordinance that can be used or interpreted as related to disaster management measures. For example, acting on comfort, convenience and wellbeing of the community can be linked with acting to increase disaster resilience to ensure the safety of the city and its community. Although there are certain provisions for municipal councils to intervene in disaster matters, it has been observed that these provisions are not sufficient enough for them to effectively engage in disaster situations. Further, it has been observed that awareness on these provisions is somewhat low among municipal officers. In addition, the country's Disaster Management Act has not delegated adequate legislative powers to local governments. Instead, most disaster management functions are carried out centrally by the country's Disaster Management Centre (DMC) and its district level coordinators who coordinate disaster management activities at a district level. Within this context, the involvement of local governments in disaster related issues is somewhat low and poor coordination between these two sectors has also been observed. Further, a number of organisations are responsible for the design, development and maintenance of the built environment within cities and as a result, a lack of clear-cut responsibilities has been observed with regard to risk reduction responsibilities. Involvement of a large number of organisations has also created coordination difficulties among them. All these act as barriers for municipal councils to effectively engage in resilience-building activities.

Despite there being a number of recent developments to increase local government's role in disaster risk reduction, there remain barriers. National policy on local government (2009) has introduced a number of welcoming provisions for local governments into disaster risk reduction and proposals to amend the Disaster Management Act has also been approved. DMC and other technical agencies responsible for producing information related to natural hazards, such as NBRO are working on producing guidelines for settlements, planning and construction in various disaster-prone areas with the support of various government and non-government organisations. Also, hazard, vulnerability and risk maps are being developed to show areas prone to various hazards and to identify elements, which are at high risk to natural hazards. Thus, it is apparent that there is a system in place within the country to strengthen the resilience of cities' built environment. However these initiatives have not been integrated into policy level and as a result have not penetrated into local level adequately. Local governments are not adequately aware of these developments happening in the central level of the country, and as a consequence, guidelines and maps are not adequately adhered to, in issuing planning approvals at the local level.

Measures to increase resilience are therefore not adequately covered in existing regulations and are not considered sufficiently when granting planning permits. Some of the cities in the country do not have an urban development plan to regulate urban planning and many individuals do not get their building plans approved prior to construction. Further, a lack of monitoring and supervision of new

developments have been witnessed. All these contribute to increased vulnerability and act as a barrier for the municipal councils to effectively engage in creating a disaster resilient built environment.

Another major challenge faced by the municipal councils is the deficiencies in qualified staff. A lack of knowledge on disaster risks and vulnerabilities among council staff has further aggravated the situation. For example, a lack of technical knowledge has become a major barrier for municipal councils. Most of the Sri Lankan local governments are not self-sufficient and are dependent on central government for their funds, as well as human and other resources. Thus, they are not in a position to initiate or regulate development on their own, and are always dependent on central government and other central level organisations. For example, when issuing a development permit, they need to consult the UDA if it is within an urban declared area and NBRO if it is a land slide prone area. They do not have the necessary expertise within the local government to make decisions but always have to depend on other organisations. Thus, the organisational culture has developed in such a way that they always look for assistance from central government when they encounter a disaster related issue. This problem is further compounded when local governments are not governed by the same political party as that which governs the country. In such cases, they frequently do not get adequate support from central government.

The municipal councils' engagement is more towards post disaster activities after the onset of a disaster, such as immediate response, relief and reconstruction, whereas their involvement in pre disaster planning is somewhat low. This is mainly attributable to their deficiencies in funding and human resources. Implementing disaster risk reduction is a costly exercise and as a result local governments are unable to contribute effectively for risk reduction initiatives due to their limited budgetary allocations. They have to allocate their limited resources to so many other priorities and, therefore, they frequently do not have sufficient financial resources available for disaster mitigation programmes. Disaster risk reduction (DRR) has not yet been mainstreamed into the local government system and therefore at the moment, there is no direct mechanism to allocate funds for DRR. Most of the decisions with regard to DRR are taken at the central and provincial government levels, and therefore the concerns of the local community are not adequately represented in planning and budgetary allocations.

DRR measures are costly and as disasters are sometimes infrequent, the concerns about these damages among the local populace are relatively low. In Sri Lanka, councillors are elected every 4 years by the voters of the respective areas on the basis of proportional representation. Initiating resilience-building is a long-term process, especially when it is applied to a city's physical assets. For example, the building of disaster preventive infrastructure may take several years from inception to completion. Likewise, urban planning is a long-term process that requires a high level of planning, and may involve relocation of the community, public consultations and mass scale construction. Consequently, many resilience-building initiatives require long-term political commitment. When councillors change periodically, priorities can also change, which undermines the city's ability to tackle resilience building in a strategic manner.

Corruption is another major obstacle in the process of making a disaster resilient built environment. For example, procedures and planning regulations can be overruled due to political pressure and bribery.

In responding to these challenges, it is necessary to empower municipal councils by developing their capacities and reforming governance, making them responsible for local disaster risk reduction. The next section will detail recommendations to empower municipal councils towards resilience-building activities.

4.2 Empowering Sri Lankan municipal councils in creating a disaster resilient built environment

Based on the findings of case studies and expert interviews, a framework was developed with the goal of empowering the municipalities towards creating a disaster resilient built environment within cities. The framework is presented in Figure 1.

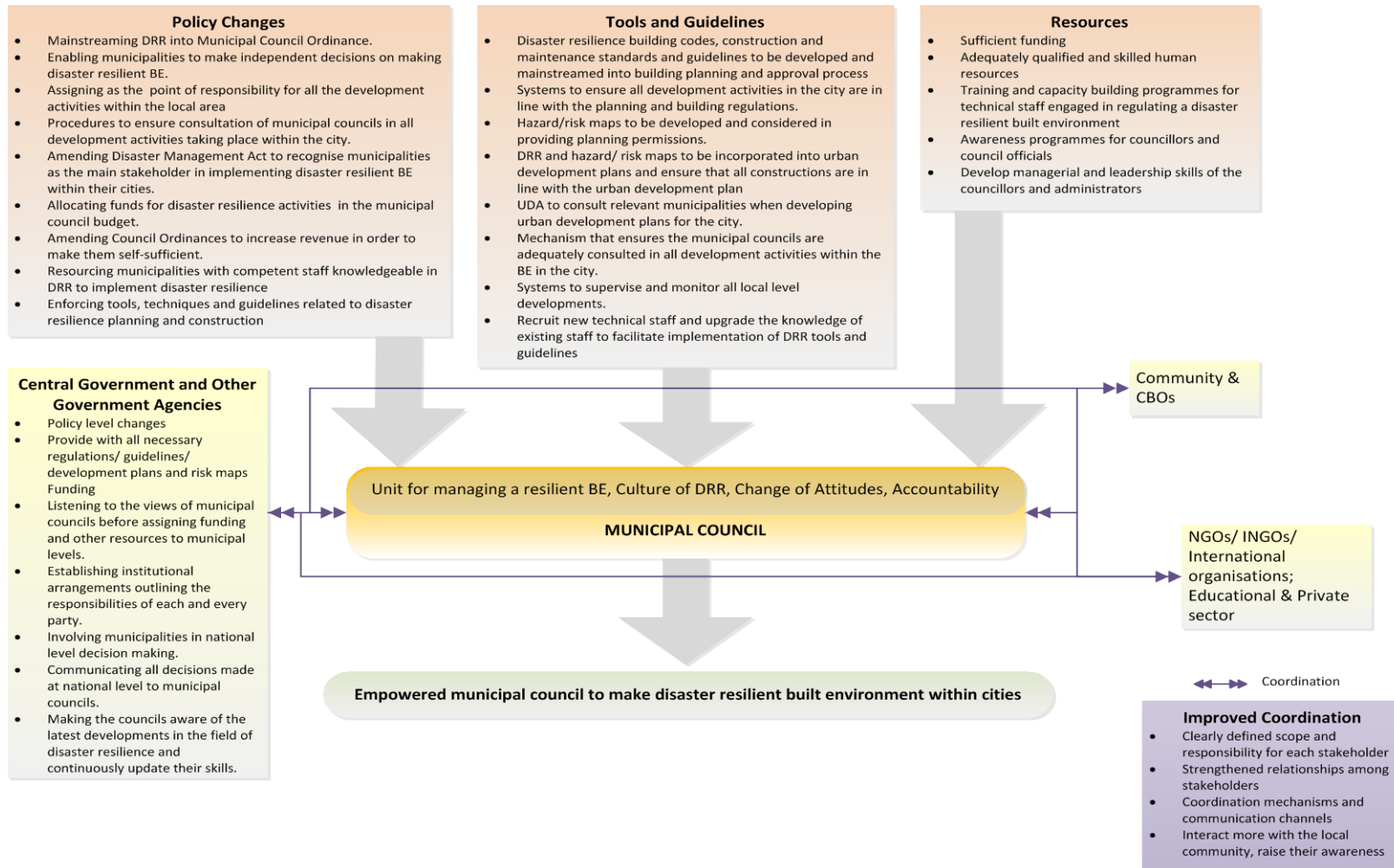


Figure 1: Framework to empower the municipalities in making a disaster resilient built environment

Policy changes to make the municipal council responsible for creating a disaster resilient built environment within their city

Policy level changes are required to delegate adequate authority to municipalities and thereby enable them to make independent decisions with regard to the resilience of their city's built environment. In doing so, it is important to amend the Municipal Council Ordinance and the Disaster Management Act, and to identify municipalities as a key stakeholder with responsibility for the resilience of the city's built environment. Creating a resilient built environment would then be a function of municipalities and they would have responsibility for initiating resilience-building activities within their cities. However, giving them the responsibility is not sufficient. Policies also need to be enacted to address their budgetary and human resource constraints. It is therefore recommended that a separate fund should be allocated to municipalities within their council budgets, and council ordinances should be amended to increase revenue in order to make them self-sufficient. This would require revision of policies related to their revenue, tax rates, and methods for tax collection. Currently, most of the central government allocations for DRR are channelled to DS and GN offices at a local level via the District Secretariat. Therefore, it is important to transfer the city's allocation directly to the municipal council so that they are no longer dependent on funding sources from District Secretariats. With regard to human resources, policy level changes are required for municipalities to recruit qualified and competent staff knowledgeable in DRR. Finally, all DRR related planning, design, construction and operation guidelines need to be enforced by law and need to be mainstreamed into existing planning and building regulations so that municipal councils can consider them when issuing planning permissions and certificates of conformity. Therefore, in making the municipal council responsible for making their built environment resilient to disasters it is important to provide them with the required authority through policy level changes, funding, providing skilled personnel and other resources, and imposing necessary rules and regulations to streamline local area development. At the same time, it is necessary to increase awareness among council officials of the importance of increasing disaster resilience within their jurisdiction and making them responsible for all the development activities within their area. In doing so, the required procedures need to be laid down to ensure that consultation takes place with municipal councils for all development activities initiated in the city. Accordingly, policies need to be implemented to make municipality responsible for all development activities carried out in the city.

Developing tools and guidelines to promote disaster resilient planning, construction and operation

Promoting a disaster resilient built environment invariably requires ensuring that all developments within the city are resilient to disasters. Municipalities therefore, need to undertake responsibility for ensuring that all new developments are constructed to appropriate standards and can withstand a disaster event. Normally, the tools and guidelines are developed by relevant central level agencies and it is important that municipalities receive these tools and guidelines to be implemented at local level. These include resilient building codes, disaster resilient planning, construction and maintenance guidelines, hazard and risk maps, set back zones and urban development plans. All these need to be developed to incorporate disaster resilient provisions and it is important to

mainstream DRR into existing planning and building regulations. It is recommended that they are enforced by law and compliance with regulations needs to be monitored in all development activities within the city. Also, it is important to develop urban development plans incorporating DRR provisions for every city in consultation with the relevant municipalities and ensure that all developments are in line with urban development plans. Systems need to be developed within councils to ensure that all development activities in the area are in line with planning regulations and urban development plans, and a separate team should be appointed to supervise all local level developments so as to ensure that all constructions are in accordance with approved plans and specifications. In parallel, it is important to recruit qualified and competent staff that can implement disaster resilience tools and guidelines, and educate the existing technical staff about disaster resilient planning, construction and operation practices in order to ensure effective implementation of DRR tools and guidelines.

Provision of necessary resources

As highlighted previously, increased responsibilities must be accompanied by policy level support to address prevailing resource constraints.

One mechanism to address financial constraints is to assign the central government's DRR allocation directly to municipal councils in order to facilitate better engagement. Similarly, a separate budget line within council budgets can be created that supports resilience-building activities. By assigning a separate budget line, it would reduce the likelihood that funds allocated for DRR are diverted to other priority areas, perhaps driven by short term political needs. Steps also need to be taken to improve the current revenue collection system, and thereby make municipalities self-sufficient. In doing so, policy level changes are further required to revise revenue collection, tax rates, and methods for tax collection.

A further recommendation is that other actors should be better engaged, including NGOs, INGOs, other international organisations and the private sector. Organisations operating in the city will generate extra sources of funding. Empirical evidence revealed that the involvement of the private sector is very limited in resilience building activities, despite them being a significant beneficiary of more resilient buildings and infrastructure.

Alongside this increase in financial resources, it would be important to impose proper control and monitoring mechanisms to ensure that the funds are used efficiently and effectively.

As well as financial resources, it is also necessary to equip municipalities with qualified staff who can implement disaster resilient planning, construction and operational guidelines. It was evident that Sri Lankan municipalities are seriously deficient in terms of qualified human resources. Developing and sustaining a resilient built environment requires qualified engineers, architects, town planners, GIS operators and staff knowledgeable on disaster risks and vulnerabilities. It is important to increase the municipal cadre and allow them to recruit qualified staff, also supported by adequate salary expenditure. Improving the pool of human resources will take time. Until a more permanent solution

is made for human resource constraints it is important to pool staff between different tasks and organisations, and to arrange a coordinated mechanism with other organisations such as the NBRO, UDA, CEA and CCD, who can provide the required technical support.

Further educational and capacity building programmes, such as seminars and workshops, need to be organised to upgrade the knowledge of existing technical staff and enable them to implement disaster resilient planning, construction and operational practices. It is also important to recruit good managers, and to build managerial and leadership capacities of municipal councillors and commissioners. This will help to facilitate good management and leadership skills.

Establishment of a separate unit within the municipality

Municipalities are involved in a number of roles, and therefore, to ensure appropriate attention, a separate unit within the council is proposed. Competent staff that are qualified and knowledgeable about disaster resilient planning, construction, operation and maintenance practices need to be allocated to such units. Establishing a separate unit will facilitate regular monitoring of the built environment and help to identify 'at risk' buildings and infrastructure, vulnerable settlements and unauthorised structures that increase the risk of disasters. Furthermore, regular maintenance of drains and canals, and supervision of construction activities should be linked to this unit in order to ensure that all construction and built assets are well maintained and resilient to disasters.

Change of organisational culture and attitudes towards DRR

Analysis of primary data revealed that municipal councils do not consider DRR to be one of their primary responsibilities. Thus, it is important to change their attitude towards DRR and to build a culture of DRR within municipalities. In this way council officers will be more likely to act to reduce risk and will take responsibility for creating a resilient built environment within their city. However, it is important to motivate them by providing assistance in terms of granting authority, funding, skill sets and other necessary resources. In addition, it is important to raise awareness among council officers about disaster risks and vulnerabilities within their city, and to educate them about the process of regulating development activities based on disaster resilient building codes, guidelines, and hazard and risk maps. Awareness raising programmes, workshops and seminars could be organised to raise awareness among council officers and to better equip them with the necessary skills and competencies required for effective risk reduction. It is important to develop the management and leadership skills of council officials, and to empower them. In doing so, it is expected that these officials would support city resilience-building activities irrespective of all the challenges and constraints.

Improving accountability

It is also important to implement proper monitoring and control mechanisms to ensure smooth running of city resilience activities. Procedures need to be laid down to ensure that all developments within the city consider disaster risk, and also, how unauthorised developments should be dealt with.

It is suggested that all properties should be inspected at regular intervals to ensure compliance with accepted resilience standards.

Strict rules need to be imposed to reduce corruption and other unlawful activities happening in the field of infrastructure development, planning permission, the issue of certificates of conformity, and land use management. It is also important to monitor and supervise all development activities taking place in the city to ensure compliance with approved plans.

Coordination among stakeholders

There are a number of organisations in the country responsible for the design, development and maintenance of the built environment. Therefore, it is very important to define each of the stakeholders' roles and responsibilities in contributing to resilience. In Sri Lanka, disaster management is centrally managed by the DMC and its district level coordinators who coordinate disaster management activities in each district through Divisional Secretariats and "Grama Niladaries". It has been observed that their coordination with the municipality is poor, and therefore, it is proposed that these relationships should be strengthened and that risk reduction should be mainstreamed into the council agenda. Furthermore, it is important to establish clear links with all the relevant government organisations, community based organisations, NGOs, educational organisations and the private sector operating at the local level in order to help support effective resilience-building. In doing so, it is assumed that municipal councils would benefit from their knowledge and expertise in disaster risk reduction, skills and manpower, additional funding sources and resources.

Community support is also essential within the local area. Therefore, it is important to interact more with the local community and to raise their awareness. This can be achieved by organising awareness raising programmes for local communities, and by educating them about disaster risks and vulnerabilities in their local area. This will help to make them understand the importance of disaster resilience to their community. This will also help to motivate the local population to take essential action towards making their residences and related infrastructure more resilient to disasters, and to support the disaster resilience initiatives conducted by the municipal council. Also, it is important to educate the local population about the process of obtaining approval for their housing plans along with the process of applying for a certificate of conformity. The process should be simplified so that local people understand the importance of the process and would, thereby be dissuaded from constructing unauthorised structures.

Receiving adequate support from the central government

In earlier sections various recommendations were provided to empower municipalities. Creating a disaster resilient built environment is a complex task that a municipality cannot undertake on its own. It requires the various efforts of different government and non-government agencies: central and provincial governments; ministries; non-government and community based organisations; the private sector; academia; and, other research organisations. While recognising the importance of a multi-

stakeholder contribution, the pre-zero draft of the Post 2015 Framework for DRR specifically highlights, “The implementation of the measures at local, national, regional and global levels will require the full commitment, goodwill, knowledge, experience and resources of all stakeholders, as relevant” (UN-ISDR, 2014b). Among all these stakeholders, the support of central government and relevant government ministries is of paramount importance. As most of the municipal councils are not self-sufficient they require funding support from central government and other donor agencies to implement disaster resilience initiatives within their city. Furthermore, central government needs to become involved in initiating the required policy level reforms to establish municipalities as the bodies responsible for city resilience initiatives. It is also expected that central government agencies will provide the necessary expertise and skills related to building a disaster resilient built environment. As such, municipalities may require assistance from other government organisations, for example, assistance from the Urban Development Authority when it relates to urban planning or the Disaster Management Centre when it relates to disaster management. However, it is very important that all these networks are properly established with the responsibilities of each and every party clearly defined. As with all planning regulations, construction and operation guidelines, hazard and risk maps and development plans are usually prepared at a central level. It is important for municipal councils to receive these regulations promptly so that they can incorporate DRR provisions for them to regulate developments at a local level. Additionally, it is important that municipal councils are consulted when plans are developed for local areas under municipal jurisdiction. It is also important to make councils aware of the latest developments in the field of disaster resilience, and to update their knowledge and skills continuously with regard to disaster risks, resilience planning and construction.

It is also important to link municipalities when national level decisions are made with regard to their cities and proper mechanisms need to be established to communicate all national level decisions to municipalities. The findings also revealed the importance of obtaining municipal council views when assigning budgets and other resources to municipal councils as they are more aware of the local level requirements. It is absolutely clear that municipal councils cannot work alone and they require support from central government agencies in order to make this initiative a success. However, empirical evidence suggests that some of the municipalities are deliberately neglected by the central government due to wider political reasons and to maintain the power of the central government. As such the success of empowering municipalities to make disaster resilient built environments undoubtedly depends on the support of the central government.

5 Conclusions

Making a disaster resilient built environment in cities is a complex task that requires the serious efforts of various stakeholders. This paper has recognised municipal councils as a key player of this exercise and has highlighted the invaluable role to be played by the municipal councils in leading to a safer built environment in cities. However it is evident that the Sri Lankan municipalities face a number of challenges in their effort of making built environment safer, and this paper therefore proposes a number of recommendations for empowering Sri Lankan municipalities. Nevertheless, it

is important to note that municipal councils cannot work in isolation and for them to effectively engage they require assistance from the central government and other related government organisations, community based organisations, NGOs, private sector and the local community. It is extremely important to define the scope and responsibility of each of these organisations and community groups within the city under the municipal jurisdiction. Out of these agencies, the role of the central government and the relevant government ministries is particularly important in bringing municipal councils into the DRR agenda. The findings suggest that these central level agencies need to take up the lead in taking the policy level decisions and initiating necessary amendments to the existing policy to make municipalities more responsible. In doing so, it is important to provide necessary solutions to their prevailing issues, such as financial and technical capabilities and legal authority. The findings further revealed the importance of consulting municipal councils in making all national level decisions in relation to the municipal jurisdiction area. Finally all relevant development plans, risk maps, disaster resilient planning, construction and operation guidelines and resilient land use practices need to be integrated into existing planning regulations and proper coordination, monitoring and control mechanisms have to be established with appropriate leadership to ensure compliance with the regulations.

References

- Bendimerad, S. (2003). "Disaster risk reduction and sustainable development", accessed from [http://info.worldbank.org/etools/docs/library/114715/istanbul03/docs/istanbul03/05bendimerad3-n\[1\].pdf](http://info.worldbank.org/etools/docs/library/114715/istanbul03/docs/istanbul03/05bendimerad3-n[1].pdf) on 29 May 2010.
- Climate Change Secretariat (2010). "Urban Development, Human Settlements and Economic Infrastructure SVP – Parts I & II", accessed from http://www.climatechange.lk/adaptation/Files/Urban_SVP_Nov-16-2010.pdf on 01 January 2012.
- Democratic Socialist Republic of Sri Lanka (2009). *National policy on local government* (Colombo, Department of government printing).
- DMC (2014). "Disaster occurrences – summary of statistics 2013", accessed from http://www.dmc.gov.lk/attchments/Summary%20of%20Statistics_Page01.pdf on 20 February 2014.
- Haigh, R. and Amaratunga, D. (2010). "An integrative review of the built environment discipline's role in the development of society's resilience to disasters", *International Journal of Disaster Resilience in the Built Environment*, vol. 1, No. 1, p. 11-24.
- Leitan, G.R.T. (2010). *Overview of decentralisation and local governance in Sri Lanka* (Colombo, Swiss Agency for Development Cooperation (SDC)).
- Kusumasari, B., Alam, Q. and Siddiqui, K. (2010). "Resource capability for local government in making disaster", *Disaster prevention and management*, vol. 19, No. 4, p. 438-451.
- Macmanus, S.A. and Caruson, K. (2006). "Code Red: Florida City and County Officials Rate Threat Information Sources and the Homeland Security Advisory System", *State and local government review*, vol. 38, No. 1, p. 12-22.
- Malalgoda, C., Amaratunga, D. & Haigh, R. (2013). "Creating a disaster resilient built environment in urban cities: the role of local governments in Sri Lanka", *International Journal of Disaster Resilience in the Built Environment*, vol. 4, No. 1, p. 72-94.

Manyena, S. B. (2006). "Rural local authorities and disaster resilience in Zimbabwe", *Disaster Prevention and Management*, vol. 15, No. 5, p. 810-820.

Marga Institute (2011). *Overview of local government systems – towards participatory democracy in Sri Lankan society* (Colombo, Marga Institute).

NBRO (2009). *Disaster management through local governments* (Colombo, NBRO).

Niekerk, D. (2007). "Local government disaster risk management", in Waldt, G., eds., *Municipal management: serving the people* (Cape Town, Juta and Company Ltd.), pp. 227-250.

UN-Habitat (no date). "Disaster Resilient City Development Strategies for Sri Lankan Cities", accessed from http://www.fukuoka.unhabitat.org/projects/sri_lanka/detail20_en.html on 20 February 2014.

UN-Habitat (2013). "*Batticaloa disaster risk reduction and preparedness plan – towards a sustainable and resilient city, Disaster resilient city development strategies for Sri Lanka*", (Colombo, UN-Habitat, Sri Lanka).

UN-ISDR. (2010). "Local governments and disaster risk reduction", United Nations International Strategy for Disaster Reduction – UN-ISDR, accessed from http://www.unisdr.org/preventionweb/files/13627_LocalGovernmentsandDisasterRiskRedu.pdf on 28 April 2010.

UN-ISDR. (2014a). "Participating local governments – making cities resilient", United Nations International Strategy for Disaster Reduction – UN-ISDR, accessed from <http://www.unisdr.org/campaign/resilientcities/pdf> on 28 April 2014.

UN-ISDR. (2014b). "Pre Zero Draft: Post-2015 framework for disaster risk reduction", accessed from http://www.wcdrr.org/documents/wcdrr/Pre-zero_draft_post2015_frmwk_for_DRR_8_August.pdf on 20 September 2014.