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# Overcoming challenges faced by local governments in creating a resilient built environment in cities

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## Abstract

**Purpose** – Although, a number of initiatives have been taken after the devastating Indian Ocean tsunami to institutionalise disaster risk reduction (DRR), gaps still exist in the Sri Lankan local government sector. Even after ten years, local governments are still struggling to overcome a number of challenges in relation to making resilience in the built environment. DRR has not yet been properly integrated into the local government system and, as a result, poses a significant challenge. Accordingly, the purpose of this paper is to discover the hindrances for local governments in creating disaster resilient built environment within cities and to propose ways of overcoming the identified limitations.

**Design/methodology/approach** – In total, 15 semi-structured interviews were conducted among experts from Sri Lanka who are involved in disaster management, local governments and built environment fields of study. The interviews were conducted with the intention of gaining expert knowledge pertaining to this field of study. The interviews were mainly designed to capture the current practices for instigating DRR initiatives within Sri Lanka, the role of local governments in creating a disaster resilient built environment and the associated challenges, and ways of overcoming such challenges to ensure an effective contribution to city resilience.

**Findings** – Primary data discovered 36 challenges along with some associated sub-challenges. The challenges were categorised under eight main themes: legal framework; lack of adequate tools, techniques and guidelines; human resource constraints; funding constraints; weaknesses in the internal systems and processes; weaknesses in the external systems; community engagement; and other challenges. The paper analyses these challenges in detail and proposes a set of recommendations to overcome the challenges in order to create disaster resilient built environments within cities.

**Research limitations/implications** – The paper provides a descriptive analysis of how the Sri Lankan local government sector could overcome the underpinning challenges of contributing to disaster resilience in the built environment and no comparative studies were conducted with in other tsunami affected regions. Furthermore, the paper analyses partial findings of a broader research, which was aimed at developing a framework to empower local governments in creating a disaster resilient built environment.

**Originality/value** – The paper provides an extensive analysis of the challenges faced by local governments in contributing to the resilience of their built environment and proposes how these challenges could be overcome while making a worthwhile contribution to both theory and practice. Accordingly, the paper recommends major changes in policy and practice with respect to bringing local governments into DRR.

**Keywords** Cities, Disaster risk reduction, Built environment, Disasters, Tsunami, Local governments

**Paper type** Research paper



## 1. Introduction

On 26 December 2004, almost a quarter of a million people were killed when an earthquake in the Indian Ocean triggered a tsunami wave. The devastating tsunami struck many countries across South Asia destroying, coastal communities and their livelihoods while making huge losses to economic, social and physical infrastructure of the affected countries. Sri Lanka was one of the countries that was severely affected by the Indian Ocean tsunami. The Joint Report of the Government of Sri Lanka and Development Partners (2005) highlights that the 2004 tsunami caused the death of 35,000 people and destroyed US\$900 million worth of assets and infrastructure. In addition, nearly one million people (234,000 families) were affected in 13 districts. The Sri Lankan coastlines were heavily populated with commercial and industrial activities and as a result of the tsunami; the economy of the entire country was severely affected (Government of Sri Lanka and Development Partners, 2005).

Following the tsunami of 2004, the Sri Lankan Government has taken various steps towards creating institutional arrangements for disaster management within the country. The country was able to approve and implement the Disaster Management Act in May 2005. The Act provides for a framework for disaster risk management in Sri Lanka (DMC-SL, 2005). In July 2005 the Disaster Management Centre (DMC) was established under the National Council for Disaster Management with a mission to create a culture of safety among communities and the nation at large through systematic management of natural, technological and man-made disaster risks (DMC-SL, 2005). Accordingly, a number of developments were observed in the country in creating institutional and policy arrangements in managing disasters. At present, all the disaster management activities are coordinated by the DMC and its district-level coordinators coordinate the disaster management activities in each district. District-level coordinators are based at District Disaster Management Coordinating Units which has been established under the guidance of the district secretary. All districts in Sri Lanka are divided into administrative sub-units known as divisional secretariats (DSs) and each DS is further divided into number of “Grama Niladarie” (GN) divisions. The disaster management district office coordinates all the disaster management activities of the district through the DS and GN divisions with the support of all other related agencies and local governments.

After the launch of the UN-ISDR campaign “Making Cities Resilient – My City is Getting Ready” in 2010, there was a growing recognition of the need to bring local governments into disaster risk reduction (DRR) and many countries, including Sri Lanka, started advocating the campaign and initiated various systems to bring local governments into DRR. The concept of bringing local governments into DRR was further supported by various scholars who highlighted the essential role of the local governments in DRR (Bendimerad, 2003; MacManus and Caruson, 2006; Kusumasari *et al.*, 2010; Manyena, 2006; UN-ISDR, 2010). In Sri Lanka, local governments are the main agency associated in granting planning permissions for new buildings, alterations and extensions to existing buildings, changes to use of buildings and changes of land use (Malalgoda *et al.*, 2013). As such, it is evident that the local governments are empowered with regulatory and legislative enactments, which are related to land-use planning and control of development activities (Malalgoda and Amaratunga, 2015). Accordingly it is believed that local governments are in a superior position in creating a disaster resilient built environment within their local areas. Many studies across the globe

have highlighted that local governments are facing a number of challenges in responding to disaster resilience activities (Pearce, 2003; Manyena, 2006; Niekerk, 2007; Bendimerad, 2003; Osei, 2007). A preliminary study that was conducted showed that the situation was similar in Sri Lanka, where it was noted that the local governments are struggling to overcome the challenges of this endeavour. Even ten years after the tsunami, DRR has not been properly integrated into local government systems and, as a result, poses a significant challenge. Accordingly, the aim of this paper is to discover the hindrances for local governments in creating a disaster resilient built environment within cities and to propose ways of overcoming the identified limitations. Accordingly, the paper provides a new paradigm in bringing local governments into DRR and contributes towards UN-ISDR's making cities resilient campaign in the setting up of its post 2015 agenda.

The paper provides a theoretical understanding of what constitutes a disaster resilient built environment and the associated role of local governments. The paper then presents its research methodology followed by a detailed analysis of the challenges facing local governments in creating a disaster resilient built environment within cities. Finally, the paper proposes the ways of overcoming the identified limitations followed by research conclusions. The next section elaborates theories behind the concept of disaster resilient built environment.

## 2. Developing resilient built environments in cities

More than half of the world's population now live in urban areas or cities, which consist of complex systems of, interconnected services and dense human settlements (UN-ISDR, 2012). There is widespread agreement that urban disasters are growing rapidly, resulting in increasing human and economic losses (Wamsler, 2014). As a result of escalating impacts of urban disasters, more emphasis is now being given to the tackling of urban risks (UN-ISDR, 2012; Godschalk, 2003; Albrito, 2012; Dubbeling *et al.*, 2009; Kreimer *et al.*, 2003; Sanderson *et al.*, 2012). Disasters that happen in urban context, or in cities can be identified as urban disasters (Wamsler, 2014). According to Wamsler (2014), there is no commonly accepted definition for the terms, "urban" and "city". However, according to Kreimer *et al.* (2003), a city or an urban area could be identified as a "set of infrastructures, other structures, and buildings that create an environment to serve a population living within a relatively small and confined geographic area". Within disaster-related literature, an urban area or a city is normally viewed as a rural-urban continuum, spanning from villages through to, small towns, secondary cities, metropolitan areas and mega cities (Wamsler, 2014). The impacts of disasters are highly detrimental when they occur in urban environments (Malalgoda *et al.*, 2013). It is therefore important to strengthen these urban cities by increasing a city's resilience to disasters.

The concept of resilience is increasingly used in a number of sectors, which implies a capacity to resist or cope with stress or threats, and remains unharmed (Satterthwaite, 2013). Even within the scope of disaster risk, the concept of resilience can be applied in a range of contexts; for example, to individuals, households and communities and to their knowledge, assets and livelihoods, to cities or specific sectors within city economies and to national economies (Satterthwaite, 2013). The focus of the current study is scattered around cities and according to Godschalk (2003), a resilient city can be defined as a sustainable network of physical systems (constructed and natural environmental components) and human communities.

Within the physical systems, the city's built environment is a key element which facilitates everyday life of human beings. Thus, when moving towards resilient cities, it is very important to develop the city's built environment in such a way that it can withstand and adapt to the threats posed by disasters. In explaining the concept of resilience in the built environment, Haigh and Amaratunga (2011) suggest that a resilient built environment will ensue when we "design, develop and manage context sensitive buildings, spaces and places that have the capacity to resist or change in order to reduce hazard vulnerability, and enable society to continue functioning, economically, socially, when subjected to a hazard event". Boshier (2008) introduced the concept of "built-in resilience" and argued that the "built-in resilience" is the quality of a built environment's capability in physical, institutional, environmental, economic and social terms to keep adapting to existing and emergent threats. In this context, the author further argues that "built-in resilience" is a quality, a process and an end-state goal that can naturally and proactively cope with dynamic changes of various unforeseen natural and human induced hazards. Accordingly, the risk can be minimised by considering design changes, reviewing land-use planning policy, investigate alternative options for research regarding resilient materials and practices, integrate emergency planning with urban planning, retrofit "at risk" buildings and infrastructure, learning from and adopting best practice and embracing the sustainability agenda (Boshier *et al.*, 2007).

According to Satterthwaite (2013) there can be large differences between cities in terms of the quality of the housing, the safety of the sites and availability of protective infrastructure. Therefore, in moving towards a disaster resilient built environment, specific risk reduction measures need to be implemented in order to reduce the risk of disasters within a city. Therefore, as suggested by Satterthwaite (2013), it is also important to look at city-specific scenarios such as whether the storm and surface water drains will cope with the next storm and will the building stock be safe from storms in cities that experience heavy seasonal rainfall. It is, therefore, evident that different cities require different solutions to the various prevailing issues of disaster risks. The built environment needs to be strengthened to address the city-specific vulnerabilities in order to protect the city from disasters. As such, improved engineering for buildings and infrastructure is necessary to minimise the damage associated with disasters (Mileti, 1999). This will lead to a resilient built environment that, in turn, will contribute to a resilient city by withstanding at a time of disasters and by providing protection to its physical and social systems. In this context, as emphasised by Haigh and Amaratunga (2010), the built environment can play an enormous role in contributing to society's resilience. Accordingly, it is clear that the built environment can significantly contribute to the resilience of cities by providing and facilitating the safety and protection of the physical and social systems of a city. However, a poorly designed and constructed built environment can negatively affect the safety of a city and can create new threats or further worsen the threats posed by natural and human induced hazards (Boshier, 2008). Further, any disruption to the built asset can affect the proper functioning of a city. Accordingly, in this paper, a disaster resilient built environment refers to a built environment which is designed, located, constructed, operated and maintained in such a way that it can absorb and resist the threats posed by natural and human induced hazards while contributing to protecting the city and its physical and social systems.

### 3. Role of the local government in developing a disaster resilient built environment

Creating a resilient built environment is a complex task which requires numerous efforts of various stakeholders such as: local government decision makers, city officials and departments, central and provincial governments, the private sector, civil society, non-governmental organisations, community-based organisations, research institutions and institutions of higher learning (Niekerk, 2007). Therefore, a well-structured institutional and administrative framework is a pre-requisite for a city's sound resilience initiatives. In achieving this, it is important to establish or strengthen city-level institutional and coordination capacities; establish a legislative framework for resilience and DRR; coordinate all emergency services within the city and create alliances and networks beyond the city (UN-ISDR, 2012; Kusumasari *et al.*, 2010). All of these require an empowered local government to take the lead in city disaster resilience activities.

Local governments are the city leaders and the closest government body to the local population. Therefore, local governments are considered as the first line of response and defence to disasters (Basu *et al.*, 2014). There are numerous arguments in the literature, which support in bringing local governments into DRR. One argument for bringing local governments into DRR is that they are the closest political authority to the local community, and it is the responsibility of the local government to protect the community from vulnerability and to reduce the impacts of disasters (Kusumasari *et al.*, 2010). Being closest to the local community, local governments are in a better position to engage the local community in DRR activities and address the community's concerns efficiently and effectively. Furthermore, as disasters are very often local events, local knowledge and measures are required for effective management of disasters and vulnerabilities (Bollin, 2003).

On the other hand, local governments are in a better position to engage and coordinate stakeholders who are involved in DRR efforts (Manyena, 2006). Therefore, local governments are expected to lead stakeholders and to facilitate the support and assistance required, in order to successfully engage stakeholders in implementing DRR initiatives. Further, local governments can be identified as the units where land use practices can be regulated and safer construction methodologies can be promoted and enforced (ADPC, 2004). As such, it is evident that the local governments are in a better position to ensure resilience of the city's built environment. Accordingly, local governments are expected to play an invaluable contribution to make their cities and built environments resilient to disasters.

### 4. Research methodology

Case studies has been selected as the most appropriate strategy for use in this context as it enables the researcher to obtain a good understanding of the context of the research and the processes (Saunders *et al.*, 2007). Accordingly, this research is based on a single case design in the context of urban cities in Sri Lanka. The urban cities of Sri Lanka has been broadly defined by the Urban Development Authority (UDA) as those living in areas serviced by the country's Municipal Councils, Urban Councils and 15 other areas (Climate Change Secretariat, 2010). These have been mainly identified on the basis of population density and national importance.

Accordingly, 15 semi-structured interviews were conducted among experts from Sri Lanka who are involved in disaster management, local governments and built environment fields of study. The experts were selected based on their knowledge, experience and involvement in the field. The knowledge and skills of the experts'

selected covered government and policy (six experts), industry and practise (five experts), academia and research (three experts) and non-government sectors (one expert). The interviews were conducted with the intention of gaining expert knowledge pertaining to this field of study and the interviews were mainly designed to capture the current practices for; instigating DRR initiatives within Sri Lanka, the role of local governments in creating a disaster resilient built environments, associated challenges and ways of overcoming such challenges to ensure effective contribution to city resilience.

An interview guideline was prepared to capture the above issues and the guidelines and a study brief was sent to the experts prior to the interview. The interviews lasted for between 40 and 80 minutes and all interviews were conducted face-to-face. All the interviews were audio recorded using a digital voice recorder with the consent of the interviewees. All the interviews were then manually transcribed using MS Word and this process allowed researcher to use direct quotations from the interviewees when presenting the data. The conceptual content analysis was used to identify the key concepts and themes pertaining to the study. As such, the study considered all relevant and significant concepts irrespective of the word/phrase count. Accordingly, the content analysis adopted for this research was taken in the form of qualitative content analysis and coded using NVivo (version 10) software and cognitive maps were developed. The next section will present the analysis of the expert interviews and discusses the identified challenges in detail.

## **5. Challenges for local governments in developing a disaster resilient built environment**

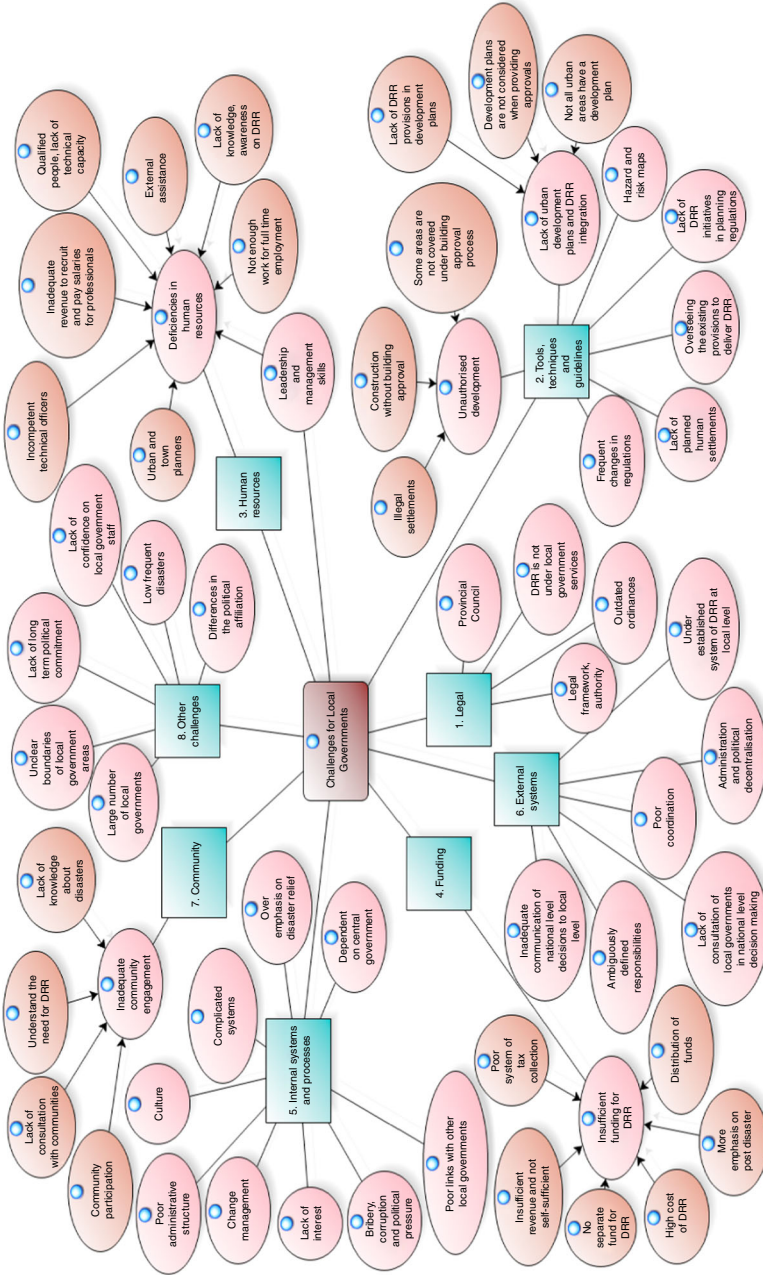
As evidenced in the literature and expert interviews, local governments are facing enormous challenges in contributing to the resilience of cities. Upon analysing the data gathered from the expert interviews, various challenges for local governments in the creation of disaster resilient built environments were discovered. The identified challenges have been categorised under eight headings in order to facilitate discussion. The eight areas identified are: legality; tools, techniques and guidelines; human resources; funding; internal systems and processes; external systems; community; and other challenges. Figure 1 depicts all challenges and categorisation of the challenges under the eight headings. Each of the eight themes is discussed below.

### *5.1 Legality*

Four challenges were categorised under the theme “legality”. The identified challenges under this theme are: “absence of DRR in the local government services”, “inadequate legal framework and authority”, “outdated ordinances” and “limited authority due to the existence of provincial councils (PC)”.

*Absence of DRR in the local government services.* It was noted that since DRR is not under the purview of local government services, councils tend to avoid the responsibility of initiating DRR assuming that it will be dealt by other organisations. Local Government Ordinances/Acts have specified the functions of the councils, however they have not explicitly recognised disaster management as a subject, although there are sections, which can be used or interpreted as being related to disaster management measures. However, many interviewees considered these provisions are insufficient to make decisions in this regard. As such this was considered to be a challenge for the local governments to contribute towards a disaster resilient built environment.





**Figure 1.** Challenges for local governments in developing a disaster resilient built environment

*Inadequate legal framework and authority.* Most of the interviewees were of the opinion that the existing legal system at local government level acts as a barrier to development of disaster resilient built environments within cities. In Sri Lanka, local governments are autonomous statutory bodies. However, the existing system is not considered to be a level of government that can administer the development functions as many of the country's development activities are carried out by the central government agencies and the PC. In addition, the country's Disaster Management Act has not delegated adequate legislative powers to local governments. However, there are other regulations and Acts which they can adhere to in order to mitigate disaster risks. There are various Acts like disposal of sewerage, disposal of solid waste, storm water disposal, planning regulations, etc., where they can intervene although there is no direct access to the DM Act. Nevertheless the gazette notification published in 2009, relating to the National Policy for Local Government, includes a number of sections about DRR, which could be seen as the first step towards bringing local governments into DRR activities. The Local Government Ministry accepted the amendments to incorporate DRR concepts into the Local Government Ordinances and Acts and most of the interviewees have seen this as a welcome step in empowering local governments.

*Outdated ordinances.* Interviewees agreed that the Ordinances/Acts governing local governments are outdated. They were of the opinion that these have not been revised to suit the current needs of the country. For an example, municipal councils are governed by the Municipal Council Ordinance No. 16 of 1947 which has been revised and re-printed to incorporate amendments made in 1987. It was argued that disasters were not a prominent subject at the time these Ordinances were made and as a result the subject is not adequately integrated into policy. Further Council Ordinances and Acts are not revised to suit the current context of the country. This also has a direct impact on council income. However, during the interviews, it was evident that the council Ordinances and Acts are now being revised to better suit the current demands.

*Limited authority due to the existence of PC.* Some interviewees were of the opinion that the second layer of government, the PC, posed a challenge to local governments. As noted by one of the interviewees, "With the introduction of PC, the powers of the local governments have been little bit curtailed and what happened was that their sovereignty and decision making powers were somewhat reduced". However, it was further noted that changing the constitution back to two tiers is not a viable option because the entire existing system has been changed to match this setup and it would be difficult to reverse it now.

### *5.2 Lack of adequate tools, techniques and guidelines to promote a resilient built environment within cities*

Seven challenges were categorised under the theme "tools, techniques and guidelines". The identified challenges under this theme are "overseeing the existing provisions to deliver DRR-related services", "lack of hazard and risk maps", "lack of urban development plans and DRR integration", "lack of DRR initiatives in planning regulations", "lack of planned human settlements", "frequent changes in regulations" and "unauthorised development".

*Overseeing the existing provisions to deliver DRR-related services.* Council Ordinances/Acts have not explicitly recognised disaster management as a subject for councils although there are sections which can be used or interpreted as related to disaster management measures. On the other hand, local governments are empowered

with regulatory and legislative enactments which are related to land-use planning and control of development activities. Although there are certain provisions to intervene in issues related to disasters, many interviewees were of the view that this power of intervention is not exercised to a satisfactory level. Thus, it is important to enhance awareness of current provisions related to disaster management among local government officials so that they can act accordingly.

*Lack of hazard and risk maps.* Another important challenge identified by many of the interviewees was the lack of hazard and risk maps. Without hazard and risk maps, councils are unable to promote a resilient built environment within their cities. In order to regulate development, hazard and risk maps are of paramount importance. However, it was evident that hazard, vulnerability and risk maps are being developed to show areas prone to various hazards and to identify sectors that are at high risk of natural hazards. However, many of these guidelines have not been properly mainstreamed into planning regulations and, as a result, they are not adequately considered at local level when planning approvals are sought.

*Lack of urban development plans and DRR integration.* Many interviewees identified the lack of development plans as a major barrier in creating a disaster resilient built environment within cities. It was emphasised that some areas of the country are not equipped with plans to regulate development. Development plans should clearly indicate the areas that are suitable for development and those that are not acceptable for development. Therefore, without a development plan, local governments are not in a position to regulate developments within their local area. Another major argument was the lack of DRR provisions in existing development plans. Consequently, it is recommended that disaster resilient aspects should be considered when preparing city development plans and when granting development permits. To supplement this process it is very important to prepare development plans for every city, integrating DRR. Another important point, which was made by experts, was that sometimes, development plans are not considered when granting development permits. As noted by one of the interviewees, it is believed that there are no adequate staffs at local level to enforce these plans and sometimes these plans are overruled as a result of corrupt practices and political interferences.

*Lack of DRR initiatives in planning regulations.* Interviewees agreed that the existing planning regulations lack the DRR element and are, therefore, not robust enough to ensure resilient built environments within cities. Also, it was evident that in many instances-specific measures related to DRR are not considered when development permits are granted and the officers are simply adhering to the stipulated regulations. It is apparent that the DMC and other technical agencies responsible for producing information related to natural hazards, such as National Building Research Organisation (NBRO), are working at 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 sectors which are at high risk of natural hazard events. However, many of these guidelines have not been properly mainstreamed into planning regulations and as a result not adequately considered at local level when granting planning approval.

*Lack of planned human settlements.* Another important challenge for local governments is unplanned human settlements. It is important to avoid developments in hazardous risk areas and it is also important to comply with specific building codes

when construction is inevitable in these zones. More recently the country was severely affected by floods and landslides and the impact was aggravated due to poor design and construction activities. As explained earlier, most cities now have development plans, which are developed by the country's UDA. However, currently most cities are unplanned and it has become a complicated procedure to regulate development based on the development plans due to ownership issues, land acquisitions and relocation requirements. These processes are time consuming because a great deal of time is required for settling disputes and litigation matters. As such issues have become a challenge for local governments to create disaster resilient built environments within their cities.

*Frequent changes in regulations.* Regulations related to building a resilient built environment change from time to time and as a result can act as a barrier for local governments to effectively engage in resilience building. One such example was that, following the 2004 tsunami, the buffer zone was initially declared to be 100 m, but later changed to 30 m. Sometimes such changes can adversely affect the resilience building initiatives and this is a challenge for the local governments.

*Unauthorised development.* Another challenge for municipalities is the difficulty in controlling unauthorised construction within cities. Many unauthorised structures and temporary buildings in coastal areas, and in cities, are poorly built and lack basic infrastructure and other facilities. These urban slums are extremely vulnerable to disasters and the councils find it difficult to relocate such people. These people have resided in these areas for many years and their livelihood and income earning avenues are based in the surrounding area. Therefore, relocating such people has become a challenge. Also there are many instances where construction takes place without obtaining planning permission from local governments. Also, there are instances where constructions are carried out without adherence to an approved plan. Interviewees agreed that these practices are common throughout the country. Councils can take legal action against unauthorised structures but this is rarely implemented in a systematic manner as there are no established systems or resources to control and monitor these activities. Another argument was that some local governments within the country lack any sort of building approval process.

### 5.3 Human resources

Two challenges were categorised under the theme relating to "human resources". The identified challenges under this theme are "deficiencies in human resources" and "leadership and management skills".

*Deficiencies in human resources.* It was evident that the local governments are seriously resource deficient in terms of skills, competencies and manpower. Most of the experts identified the lack of technical capacity as one of the major challenge faced by local governments in contributing to urban planning and this has adversely affected the process of making cities resilient to disasters. In supporting this one of the experts stated, "They don't have qualified people and therefore even if they have the authority they are not in a position to promote a disaster resilient built environment without the qualified and experienced people". Adding to this some interviewees highlighted the unwillingness of professional staff to move to councils, which are far from the capital of the country. Because of this issue experienced manpower varies from region to region. It has also been identified that most local governments in Sri Lanka do not employ qualified town planners and development officers. Another point put forward

concerned the lack of knowledge and awareness of DRR. Accordingly, some interviewees highlighted the fact that councillors do not have a basic knowledge about the impending disasters. As a result, some of their decisions adversely affected the city's resilience. Furthermore, without qualified people and awareness of disaster risks and vulnerabilities, it is unlikely that disaster risks and vulnerabilities are considered when issuing development permits and certificates of conformity. Another important question raised was "who will pay their salaries, central government, or local government have to fund such staff themselves?" Sri Lankan local governments are not self-sufficient and they do not have sufficient revenue to pay the salaries of additional professional staff. Salary demands are high for the qualified people and qualified people are reluctant to work in the local authorities, because the salary levels are quite low. Therefore, it is very important that all these issues are raised at policy level and regulations amended accordingly.

*Leadership and management skills.* High standards of environmental sustainability and resilience were evident in some local government areas, which clearly highlighted the management capabilities of the governing councillors and their staff. One of the experts noted "irrespective of all kind of restrictions that is there in the local authority there are very good mayors and councillors with good management skills and they have taken their local authority to a very high standards". It is clear that good leadership and management can change the attitudes of local governments towards disaster resilience. Thus, having mayors and municipal commissioners with outstanding leadership qualities and management capabilities is essential to promote the disaster resilience agenda within the local government systems.

#### 5.4 *Insufficient funding for DRR*

To implement DRR initiatives to achieve a resilient built environment, substantial fund allocations are required. Therefore, as noted by many interviewees the financial component does not encourage people to include DRR in the planning process. Most of Sri Lankan local governments are not self-sufficient and are unable to make their own decisions to implement projects to reduce disaster risks within the city. All of the interviewees considered insufficient revenue to be a barrier to resilience building. Local governments do not have separate funds to implement DRR initiatives and have to depend on the central government and other donor organisations for funding. One reason why the funds are not channelled to the local authorities is because disaster management is handled by the DSs. Furthermore, most of the disaster-related funds are allocated for relief and reconstruction work and the fund allocations for mitigation are somewhat low, which is another area which needs to be addressed in policy. Interviewees also discussed about the poor tax collection system of the local governments. Also, it was emphasised that many people avoid paying taxes and other fines and the councils do not have a proper system to monitor and control these activities. It was further noted that the current system for distribution of funding represented a challenge. A local government is divided into a number of wards, depending on its size and funding for development is presently allocated on a ward wide system. As noted by one of the interviewees, this is not an acceptable system as the funding goes to a micro level without considering the development of the entire city. Accordingly one of the interviewees noted, "One project in a city may be more important than individual projects here and there and would not provide any benefit to the entire city".

### 5.5 Internal systems and processes

Nine challenges were categorised under the theme “internal systems and processes”. The identified challenges under this theme are: “bribery, corruption and political pressure”, “poor change management”, “culture”, “dependence on central government”, “lack of interest”, “over emphasis on disaster relief”, “poor administrative structure”, “poor links with other local governments” and “complicated systems”.

*Bribery, corruption and political pressure.* Corruption is yet another major issue, which affects the creation of resilient, built environments within cities. It is the duty of the local government to ensure that certain planning regulations and guidelines are adhered to at the planning and construction phases of the built environment. Sometimes these procedures are overruled due to various reasons. Political power is foremost throughout the country and sometimes planning regulations are not taken into consideration when granting development permits due to political pressure and influence. Often political decisions are more powerful than planning regulations and some of the important planning decisions are taken by the politicians overruling all the planning regulations. Bribery and corruption is yet another practice that is prevalent, which often influence decision making. Due to various malpractices, even after obtaining planning permissions, construction may not proceed as per the approved plan. One argument for such a high level of corruption and political interference is that it is due to the enforcement of too many controls and restrictions. Accordingly, one of the experts stated, “If you have lot of controls, the people won’t understand these controls. What they will do is they will offer some money in order to get the approval”. Therefore, it is important that the systems are made user-friendly and necessary actions taken to educate the community on the importance of resilience.

*Poor change management.* It was highlighted the difficulty of changing the already established systems and procedures associated with the local governments system. As argued by many interviewees, a number of changes are required to bring local governments into DRR. These changes include policy-level changes, staff, resources, workload allocations and new responsibilities. However, as argued by the interviewees “There will be some resistance to change” and further emphasised that “it is difficult to change it now”. However, by adopting a systematic process to manage changes the attitudes of local government officers can be changed. Therefore, it is essential to promote the importance of building a resilient built environment and to make local government responsible for their actions in relation to resilience in the built environment. Therefore, changes should be managed carefully while highlighting the benefits it would accrue to the city and to its people.

*Culture.* The local governments in Sri Lanka always look for assistance from central government at the times of disasters. Sometimes, even though they have the power to intervene as per the Ordinances and Acts, they do not get fully involved. They think disaster management and resilience is not their business and therefore, they do not take the leadership and wait to receive the instructions from the relevant agencies. Therefore, a change of organisational culture and attitudes is required in order to encourage local governments to create resilient cities.

*Dependence on central government.* Based on the expert interviews, it was apparent that most local governments in Sri Lanka are dependent on central government for their funds and other resources. Most of the local governments do not have the capacity to initiate DRR initiatives. Accordingly, they are dependent on number of other agencies, for financial, human and other resources. For example, they are dependent on

agencies like, NBRO, UDA and Coastal Conservation Department (CCD), etc., for specific expertise, when granting planning permissions.

*Lack of interest.* Another challenge pointed out by the interviewees was the lack of interest in the DRR subject domain. Some local government officers think that implementing DRR is not their responsibility but the responsibility of the DMC and its district coordinators. As such, some officials are not much interested on DRR-related matters. However, it was clear that local governments are expected to play a key role in creating disaster resilient built environments within cities because they are the main authority in the country that grants planning approval for new buildings, alterations and enlargement of existing buildings, changes to use of buildings and changes of land use.

*Over emphasis on disaster relief.* It has been observed that with regard to disaster management, the focus is mainly on immediate response, relief and reconstruction activities after the onset of a disaster. As such, interviewees were of the opinion that local governments are hardly involved in the risk reduction activities within their city but they are actively involved in post disaster activities. For relief and reconstruction there are certain norms set by the government, and local governments usually receive funds from central government and various donor organisations for implementation of these projects. However, it was evident that the emphasis on pre-disaster protection is relatively low and this is mainly due to the lack of financial and human resource capabilities. However, there are some positive measures that had been taken: "in certain disasters like landslides, there have been very positive measures taken for risk reduction through NBRO".

*Poor administrative structure.* Another weakness observed in the existing system was the poor administrative structure of the local governments. It has been noted that many individuals do not get their building plans approved prior to construction and even after obtaining approvals it is common practise to undertake the construction work without considering the approved plan. Also, there are many unauthorised developments carried out in the country. It is the duty of the local governments to control illegal construction activities taking place in their city. However, they do not have adequate systems established to control such activities and no adequate mechanisms have been established to supervise construction activities in the city.

*Poor links with other local governments.* Another challenge identified through the expert interviews was the poor links between different local governments. It was evident that local governments are not cooperating with each other sufficiently. For example, one of the experts stated, "You need lands for solid waste disposal. Some municipalities such as Colombo municipal council find it difficult to find land, because no local authority allows others to bring their waste and dump". One reason for the poor relationship between local governments is due to their working in isolation. Also, it is evident that there is little sharing of resources between local governments.

*Complicated systems.* One reason that the communities are not adhering to planning regulations is that the systems are not user friendly. As a result there is a tendency for people to build houses and other buildings without applying for planning permission and sometimes, even after obtaining planning approval, construction takes place without adhering to the approved plan. Another issue raised was the involvement of a large number of stakeholders; people are not clear to whom they should submit their applications. For example, in areas prone to landslides it is necessary to obtain clearance from the NBRO. If local governments were to be empowered to create their own systems to dispense approvals, the process would become more user-friendly.

Also, local governments have to rely on a number of other agencies, for funding, development plans, hazard and risk maps, and therefore, it is very important that these links are properly established in order to make the systems work.

### 5.6 External systems

Six challenges were categorised under the theme “external systems”. The identified challenges under this theme are: “administrative and political decentralisation”, “poor coordination”, “under established system of DRR at local level”, “lack of consultation of local governments in national-level decision making”, “inadequate communication of national-level decisions to local level” and “ambiguously defined responsibilities”.

*Administrative and political decentralisation.* It is important to note that most of the disaster management functions in Sri Lanka are centrally coordinated by the DMC. All districts in Sri Lanka are divided into administrative sub-units known as DSs. Each DS division is again divided into a number of “GN” divisions. The disaster management district office for each district coordinates all disaster management activities through the DSs and “GN” divisions. With this current arrangement the politically decentralised local governments are not considered to be important stakeholders in creating disaster resilient built environments within cities. As such the involvement of local governments in disaster-related issues is somewhat low.

*Poor coordination.* Effective implementation of resilience building requires the participation of various sectors and disciplines such as: the three tiers of government (national, provincial and local), private sector, community, non-governmental organisations, community-based organisations, research institutions and universities. Furthermore, there are a number of governmental organisations responsible for the design, development and maintenance of the built environment. All these government institutions have to play a role in the city’s resilience building. Many of these agencies have district-level offices and work closely with the local governments in the city’s resilience building. It was noted that in many instances the agencies act in isolation as there is no clearly established line of coordination between different agencies. It was further highlighted that resources are accessed at different places and, as such, proper coordination between the agencies is important to bring together dispersed resources and the knowledge and skills required to build resilient built environments within cities.

*Under established system of DRR at local level.* Another point which came out at the expert interviews was that DRR is not properly established at local government level. Currently, disaster management activities are coordinated by the DMC. This means that the involvement of local governments in disaster-related issues is somewhat limited. On the other hand, there are a number of governmental organisations responsible for the design, development and maintenance of the built environment and urban planning functions in close collaboration with various agencies under different government ministries. All these government institutions have a role to play in building resilience into a city. In relation to the involvement of the many stakeholders, one of the experts stated, “Sometimes the responsibilities of each stakeholder towards resilience building is not clear”. Accordingly, the involvement of a large number of stakeholders in disaster resilience activities leads to a lack of clear cut responsibilities and overlapping of responsibilities. Experts claimed that the process is not simple and takes too much time due to the involvement of so many organisations. However, it has now been realised that local governments are an important stakeholder in this regard. As a result, a number of initiatives are taking place to involve local governments in



DRR and the amendments to local government ordinances and disaster management act are now under way.

*Lack of consultation of local governments in national-level decision making.* Another important challenge identified through the expert interviews was that local governments are not consulted in national-level decision making. At a national level, many decisions are taken in relation to local area development, budgetary allocations for local governments, decisions related to human and other resources. As such, interviewees were of the opinion that some of the decisions of the central government are not necessarily compatible with the local circumstances. Although local governments are more familiar with local-level conditions and community needs they are not always consulted when development decisions made at national level. Therefore, it is important to implement procedures for channelling all local-level development work through local governments.

*Inadequate communication of national-level decisions to local level.* National-level agencies such as, DMC and NBRO with the support of various other stakeholders, are continually working on producing hazard and risk maps and guidelines to enhance resilience in disaster prone areas. However, these initiatives have not been adequately penetrated to the local level. According to some experts, local governments are unaware of these developments happening in the country. Thus, these guidelines and maps are not adequately adhered to, when planning approvals are granted at local levels.

*Ambiguously defined responsibilities.* Disaster management is a comparatively new subject for the country and as a result the systems are not well established. Within the current system, DMC is responsible for coordinating all the disaster management activities of the country. However, a lot of initiatives have been instituted to bring local governments into the DRR process and the DMC is working towards bringing local governments into DRR. Despite these new developments it is evident that local officers are not sufficiently aware about their role in resilience building. Accordingly, one of the experts argued that the responsibilities are not been properly defined and communicated to the councils, and therefore, this lack of awareness can create a barrier for the effective implementation of risk reduction activities.

### 5.7 Inadequate community engagement

Local governments cannot act in isolation to create cities resilient to disasters. They require support from various other organisations and communities. During the expert interviews, a relatively low level of community engagement was evident in some council areas. In many cases, the community seeks council services only when they need a license or a permit. Other than that, their involvement with the local governments is somewhat low. It was noted that many of the local residents do not even know their local authority. This shows how remote the community are from the local authority and how poor their interaction with the local authority. When it comes to DRR, consultation with the local community is very important to identify the real requirements of the area, in order to mainstream the risk reduction into local government planning. However, there is only, very little consultation with the local people and therefore the needs of the people with regard to various disasters are not represented in their budget or the programmes. Also, at the moment most of the decisions, with regard to DRR, are taken at the central and provincial government level and therefore the concerns of the local community are not adequately represented in planning and budgetary allocations. Another important challenge that came across was the lack of

knowledge about disasters and risk reduction. As a result the community is not very interested in the subject and does not adequately understand the need for DRR. Therefore, they are not willing to spend extra money on specific DRR measures and are compelled to obtain approvals by unethical means.

### 5.8 Other challenges

Six challenges were categorised under the theme of “other challenges”. The identified challenges under this theme are: “differences in the political affiliation between local and central governments”, “low frequent disasters”, “lack of confidence in local government staff”, “large number of local governments”, “unclear boundaries of local government areas” and “lack of long-term political commitment”.

*Differences in the political affiliation between local and central governments.* Another factor illustrated via the expert interviews was that some local governments do not receive adequate support to create a disaster resilient built environment within the city due to the differences in the political affiliations of the governing parties. If the local government is not linked with the governing party of the country it sometimes happens that these local governments do not get adequate support from central government. Also, in some cases, there have been similar issues with PC which are governed by different parties. As such, some of the interviewees highlighted this as a challenge for those local governments which are governed by a party other than the ruling party of the country.

*Low frequent disasters.* Another challenge identified by the expert interviews was the irregular occurrences of disasters. Disasters such as flooding and landslides are quite regular in Sri Lanka but other disasters such as tsunamis and cyclones are irregular in nature. Therefore, for such disasters it is very hard to convince people to make use of mitigation measures in their constructions. One reason is that these DRR measures are costly and it is believed that disasters occur infrequently and therefore, concerns about damage by hazardous events are relatively low. Therefore, the financial cost do not encourage the inclusion of risk reduction measures in practice. Thus, it is very important to educate the community about the risks of disasters and to make them aware of the adverse effects they might have to encounter if mitigation measures are not considered.

*Lack of confidence in local government staff.* Another challenge noted by some of the experts was the lack of confidence in local government officers. One reason for that was their limited knowledge of planning, construction and DRR. As a result, central-level agencies are reluctant to get involved with their projects. Also, some people think that some local government politicians are corrupt and as a result funding agencies think twice before involving them in DRR initiatives. In addition, the community is sometimes reluctant to listen to their advice on planning and construction due to their lack of confidence in these people. Some local governments are not governed by the same political party that governs the country and in such cases often these local governments are not adequately supported by the central government.

*Large number of local governments.* According to some experts, having a large number of local governments is another challenge, which affects a city’s resilience. As explained earlier, in Sri Lanka there are 335 third tier local governments including 23 municipal councils, 40 urban councils and 272 “pradeshiya sabhas”. All central-level agencies such as UDA, Irrigation Department, Coast Conservation Department and DMC have only one district-level office and therefore, with the current system they

need to deal with a large number of local governments in developing resilient built environments. In this scenario, some experts perceive that having a large number of local governments is a challenge.

*Unclear boundaries of local government areas.* Also it was highlighted that in some areas boundaries for local governments are not clear and as a result, those areas are not receiving attention. However, it was mentioned that re-demarcation of local boundaries is currently taking place and as a result this challenge is not considered to be relevant.

*Lack of long-term political commitment.* All local governments are led by full time mayors/chairmen who are nominated by the leading party and appointed by the Commissioner of Elections. It is evident that initiating city resilience strategies is a long-term process, especially when it is applied to the built environment. As such, many of the disaster resilience initiatives require long-term political commitment. In Sri Lanka, councillors are elected every four years. When councillors are changed periodically, the priorities would also change and this could adversely affect the city's resilience building initiatives. Therefore, it is very important to integrate resilience building into local government agendas by way of policy changes and to raise awareness of the need for resilient cities within the local government sector.

While supporting the literature, the empirical evidence revealed that Sri Lankan local governments face a number of challenges in contributing to making disaster resilient built environments within cities. The literature identified a number of challenges faced by local governments in making disaster resilient cities. The key barriers identified through the literature review are: the lack of knowledge on DRR initiatives (Kusumasari *et al.*, 2010); lack of interest and political will (Niekerk, 2007); human resource constraints (Manyena, 2006); lack of financial capability (Bardhan and Mookherjee, 2006; Manyena, 2006); internal organisational and administrative weaknesses (Osei, 2007); lack of community engagement (Pearce, 2003); managing a long-term process (UN-ISDR, 2010); lack of focus and reactive approach to DRR (UN-ISDR, 2010); inadequate urban planning (Voogd, 2004); lack of monitoring and supervision of new developments (Voogd, 2004); capture of local-level responsibilities by central government (Pelling, 2003; Stren, 1989); lack of authority (Bendimerad, 2003); multi-layered governance arrangements (UN-ISDR, 2010); unstable political systems (Manyena, 2006); and relationship issues with central government (Sabri and Jaber, 2007). All of these issues were evident in the empirical data analysis. However, the empirical investigation provided an opportunity for deriving a more comprehensive list of challenges, which are directly applicable to the Sri Lankan system.

## 6. Overcoming the challenges faced by the local governments

Based on the findings of the expert interviews, a set of recommendations are proposed to overcome the challenges faced by the Sri Lankan local governments in making a disaster resilient built environment within the cities under their jurisdiction. This section highlight the main suggestions put forward by the experts to overcome the identified challenges.

The main recommendation is the need for capacity building. The technical staffs that assess planning applications have little awareness of disaster risks and vulnerabilities, and therefore, their skills and capabilities need to be enhanced through training and capacity building programmes. Furthermore, experts highlighted the need for equipping councils with qualified technical staff, especially qualified engineers, architects and town planners who can assess disaster risks and vulnerabilities of proposed constructions. Also, separate teams need to be formed

within the council to conduct regular inspections of the built environment to ensure resilience. All these require sufficient levels of human resources and funding allocations for successful implementation.

As highlighted in the earlier section, DRR measures are not properly integrated in planning and building regulations. Therefore, experts highlighted the need for revising the existing regulations to ensure DRR practises are incorporated in planning and construction. Accordingly, one of the experts stated, "We need to provide a revised set of regulations incorporating DRR so that the councils can ensure the resilience of the buildings". It was further highlighted the need for integrating hazard and risk maps into city development plans and one expert stated, "Development plan need to be further improved identifying zones which are at the risk of disasters and the developments in such areas has to be controlled", Furthermore, councils need to be provided with a sufficient level of authority to acquire the necessary lands and demolish unauthorised structures which are necessary to implement the city development plans. Moreover, it was noted, "Disaster management is not a subject of local governments and not coming under the council ordinances/acts". As such, it is important to recognise local governments as a main stakeholder in the process of making a disaster resilient built environment without which it is difficult for the councils to become directly involved in the DRR activities of the city. In doing so amendments are required to the council ordinances/act as well as to the Disaster Management Act. Accordingly, one of the experts noted, "If we can identify DRR as a council service, we can allocate funding through the council budget". However, the local government is an independent body under the supervision of the PC and therefore they are empowered to carry out any necessary work on their own. Nevertheless, it was noted that the attitude and culture of council officials was to strictly carry out to what is specifically written in the council ordinances/act. Accordingly, it is very much important to incorporate DRR into council ordinances/act and to make them responsible for making a resilient built environment within the city.

Experts highlighted the importance of community engagement in order to build trust and relationship with the community. Experts were of the opinion that good community participation can enhance the possibility of making a disaster resilient built environment as it will facilitate team working. In doing so, communities will support the land acquisition processes as they will understand the need for that in terms of making the city resilient to disasters and stated, "Good relationships, with the community can accelerate the acquisition process". Experts suggested community awareness programmes about disasters and vulnerabilities and stated "By educating community on disasters and vulnerabilities we can reduce unauthorised and disaster prone constructions". Furthermore, it was highlighted the need for revisiting coordination mechanisms and identifying the responsibilities of each stakeholder towards building a disaster resilient built environment within the city. A number of government agencies such as UDA, CCD, Irrigation Department, Central Environment Agency, Road Development Authority and DM District Coordinating offices are in operation at district or provincial level, and therefore, the importance of defining the responsibilities of each of these agencies and how they are to work with the councils was highlighted.

Though the local governments have the powers, the powers are not exercised adequately due to various reasons. One reason is that the officials within local government do not think that making a disaster resilient built environment is the responsibility of the local government. Also, due to a variety of political pressures they do not act without the consent of the central and provincial governments. Experts also highlighted that political pressure and corruption hinder the process of making a disaster resilient built environment

within the city. Accordingly, experts suggested imposing strict rules on corruption to create an environment where the councils can make meaningful decisions to make the built environment of the city resilient to disasters. Accordingly, it was evident that policy-level decisions need to be taken to make the council responsible for initiating a disaster resilient built environment within the city while upgrading their capacities in terms of knowledge and resources and providing support in terms of rules, regulations, guidelines, a development plan with hazard and risk maps together with good coordination system between all the relevant stakeholders so that they can implement them at city level.

## 7. Conclusions

After suffering from the Indian Ocean tsunami, a number of developments were seen in institutionalising DRR in Sri Lanka. Among them, establishing the DMC and enacting the Disaster Management Act are highly significant. Although, a system is now established in the country to manage the DRR activities, the involvement of the local government sector is not considered highly significant. However, the local governments are the primary agency of the country in providing planning permissions and certificate of conformity for buildings to ensure that the developments are in accordance with the approved plans. Accordingly, local governments are expected to play a significant role in creating a disaster resilient built environment within their cities. However, even after the tenth anniversary of the Indian Ocean tsunami, significant challenges still exist in local government sector and little has been done to bring local government into DRR. The findings from the expert interviews revealed that local governments in Sri Lanka are facing a number of challenges in their contribution to create disaster resilient built environments within cities. The expert interviews discovered 36 challenges along with associated sub-challenges. The challenges were categorised under eight main themes: legal framework; lack of adequate tools, techniques and guidelines; human resource constraints; funding constraints; weaknesses in the internal systems and processes; weaknesses in the external systems; community engagement; and other challenges. The paper provides a major synthesis of each of the challenges in detail and proposes a set of recommendations to overcome the challenges to create disaster resilient built environments within cities. Accordingly, the paper recommends major changes in policy and practice with respect to bringing local governments into DRR. The findings discussed in this paper will be useful for relevant policy makers to understand the challenges faced by local governments and how they could be empowered to make a disaster resilient built environment within cities. Also, the findings will be useful for local governments in helping them to understand their role in making disaster resilient built environment within cities and to take steps to overcome the challenges they face in this endeavour.

The expert interview findings are not context specific and are applicable to all cities in Sri Lanka. Accordingly, the challenges, ways to overcome them and recommendations are applicable to all local governments based in Sri Lankan cities. However, findings can be generalised to other developing countries, with similar policies and governance structures.

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