

The progress of local governments in making cities resilient: state of play

Prof. Dilanthi Amaratunga,

Global Disaster Resilience Centre, University of Huddersfield, UK

Dr Pournima Sridarran,

Global Disaster Resilience Centre, University of Huddersfield, UK

Prof. Richard Haigh,

Global Disaster Resilience Centre, University of Huddersfield, UK

Sanjaya Bhatia,

**Head of UNISDR's Incheon Office and Global Education and Training Institute for
Disaster Risk Reduction, UNISDR, Incheon, Republic of Korea**

Mutarika (Mai) Pruksapong,

**Programme Officer, Office for Northeast Asia (ONEA) and Global Education and
Training Institute (GETI), UNISDR, Incheon, Republic of Korea**

Abhilash Panda,

Deputy Chief, Regional Office for Europe, UNISDR, Brussels, Belgium

1. Introduction

The significant rise in the global cost of disaster and rapid urbanisation are the two worldwide trends that are often noted in disaster studies (Benson & Clay, 2006). Global Assessment Report on Disaster Risk Reduction by (UNISDR, 2015) estimates that the economic losses resulted from natural disasters are reaching an average of USD 250-300 billion. In future, this is expected to reach USD 314 billion in the built environment sector alone. On the other hand, rapid urbanisation and increasing share of economic activities taking place in cities, further increase the impact of urban disasters (Malalgoda, Amaratunga, & Haigh, 2016). Thus, it is essential to increase the resilience of urban cities to withstand against any potential catastrophes without many physical and economic losses. However, resilience cannot be achieved without significantly changing the way of managing urban spaces. Further, it requires numerous efforts and contribution from the all concerned stakeholders.

In general, local communities are considered as one of the key stakeholders in building urban resilience, as they are the primary victims and the first to respond to disasters (Gaillard & Maceda, 2009). Theoretically, communities should be more interested in reducing their risk considering their survival and well-being. However, the lack of knowledge about the local hazards, lack of information, and ignorance of local leaders (King, 2000) hinder them from realising the risk they are facing. Thus, studies emphasise the importance of the role played by the local governments into Disaster Risk Reduction (DRR), as they are the closest government bodies to the communities (Basu, Srivastava, Mulyasari, & Shaw, 2013; Malalgoda et al., 2016). Being closest to the local communities, the local governments have the potential to involve the local communities in DRR, utilise the local knowledge, and provide the necessary support and assistance. Though the functional distribution between the central government and local government varies among the countries depending on whether the government is unitary or federal, (Col, 2007) argues that the government level for emergency management should possess adequate equipment and capacity, while being close to the ground and midst of the disaster event. This argument shows that the local governments are the most appropriate stakeholders to plan and execute DRR. However, studies highlight (Basu et al., 2013; Malalgoda et al., 2016) various hindrances faced by the local authorities such as legality, inadequate funding, human resources, and techniques, which emphasise the need of capacity development of the local governments.

In order to examine the progress of the local governments, how they can be empowered, and reformed, a range of institutions, including government agencies, non-governmental agencies, UN, and research centres, have developed tools. In relation to this, UNISDR launched 'Making Cities Resilience' (MCR) campaign in 2010. The

campaign was intended to convince city leaders and local governments to work along with local activists, grassroots networks, and national authorities. The campaign developed ten essentials based on the Hyogo Framework for Action for the local level (Panda & Amaratunga, 2016). These ten essentials were further modified following the Third UN World Conference on Disaster Risk Reduction, held from 14th to 18th March 2015 in Sendai, Japan. The Ten Essentials for Making Cities Resilient which provide the basic building blocks for understanding disaster resilience at the local level were modified and aligned to the guidance provided by the Sendai Framework for disaster risk reduction monitoring, global targets, and the overall Sendai Monitoring framework. Based on these ten essentials, preliminary and detailed Disaster Resilience Scorecard for cities were developed by the UNISDR. This paper is an attempt to report the outcomes of the preliminary scorecard results.

2. Disaster resilience and cities

While conflicting between development and conservation processes, cities are increasingly confronted by catastrophic natural events as a result of ongoing climate change (Asprone & Manfredi, 2015). (Rose, 2014) lists concentration of population in the built environment, concentration of complex infrastructure, a large percentage of low-income and other disadvantaged population groups, being the targets for terrorists, and complex nature as the foremost reasons for city vulnerability. Thus, being the heart and engine of the global development of the contemporary society, cities need resilience to withstand and mitigate any adverse events.

According to the Global Risk Report which was published by the World Economic Forum, extreme weather events (e.g. floods and storm) tops the list of global risks in terms of likelihood in 2017 (World Economic Forum, 2017), and it is the second in the list of global risks in terms of impact. Further, large-scale involuntary migration, major natural disasters (e.g. tsunami and earthquake), large-scale terrorist attacks, and massive incident of data fraud are in the top five of the list. Extreme weather events and natural disasters, being the most likely and impactful risks of the world, demand most world's attention and has led to many declarations and policy changes.

Approaches for building resilience may range from highly technical and resource-intensive, to simple and inexpensive practices. "Making Cities Resilience" (MCR) Campaign by United Nations International Strategy for Disaster Reduction (UNISDR) is a simple tool to promote resilience-building in cities through raising awareness among local governments through providing tools, technical assistance, city-to-city support networks, and learning opportunities. 'Making Cities Resilience' scorecards were developed following the adoption of the Sendai

Framework for Disaster Risk Reduction and the Sustainable Development Goals (SDGs). SDG 11 is particularly relevant to this campaign as it focuses on sustainable cities and communities.

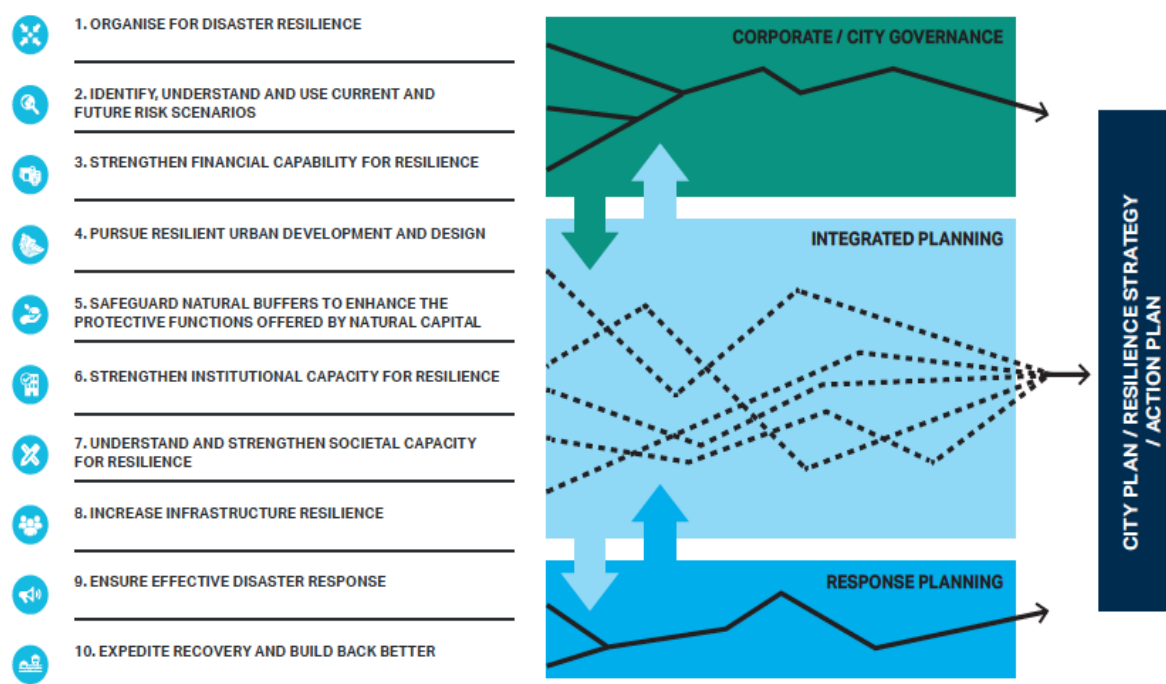
2.1 The making cities resilient campaign

The United Nations Office for Disaster Risk Reduction (UNISDR) along with its partners implemented the Making Cities Resilient: 'My City is Getting Ready' Campaign in order to promote resilience, sustainable urban environment, and understanding of disaster risks (Unisdr, 2017). The Campaign was intended to convince city leaders and local governments to work along with local activists, grassroots networks, and national authorities. The objectives of this campaign are raising awareness of citizens and governments at all levels, identifying budget allocations within local government funding plans, and including disaster risk reduction within participatory urban development planning process and protecting critical infrastructure (Panda & Amaratunga, 2016). The campaign developed ten essentials based on the Hyogo Framework for Action for the local level. These ten essentials were further modified following the Third UN World Conference on Disaster Risk Reduction, held from 14th to 18th March 2015 in Sendai, Japan. Pilot tests for the new essentials were conducted in 20 cities, and the essentials were revised based on the feedback. Subsequently, MCR action planning and monitoring tool for disaster risk reduction at the local level was developed.

2.2 The ten essentials and assessment scorecards

The ten essentials were carefully developed with the objective of 'to be actionable'. These essentials are list of interdependent steps that need to be undertaken to build and maintain resilience. Figure 1 shows the Ten Essentials which are grouped in three categories. The first three Essentials cover governance and financial capacity, Essential four to eight cover many dimensions of planning and disaster preparation, and the last two Essentials cover disaster response and post-disaster recovery. All Essentials are related to each other to achieve disaster resilient cities.

Figure 1: The ten essentials for making cities resilient (Source: UNISDR)



Based on the developed essentials, a self-assessment and monitoring tool, which is known as ‘Disaster Resilience Scorecards for Cities¹’ was developed. The scorecard provides a set of assessments that will allow local governments to assess their disaster resilience. The Scorecard offers two levels of assessment: a preliminary assessment containing 47 indicators under the “Ten Essentials”, each with a 0-3 score, and a detailed assessment containing 147 indicators under the scale of 0-5 score, that builds on the indicators from its preliminary assessment. The Scorecard allows the respondents identify owners, actions to improve and means of verification regarding each indicator they can take to further strengthen their capacities in that particular essential.

3. Research method

The focus of this paper is to report the results of 169 Preliminary Disaster Resilience Scorecards for Cities into an analysis of the global and regional state of the art and trends of resilience policies and actions at the level of local governance, reflecting the local progress in resilience building. 169 completed scorecards were used to draw the analysis. Among them, 51 scorecards are from Asian cities, 48 scorecards are of African cities, 50 scorecards are of

¹ <https://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4>

American cities, and 20 scorecards are from Arab cities. Multiple descriptive statistical techniques were used to analyse the ordinal data, which were further processed using MS Excel software. Content analysis, a form of thematic analysis, was used to identify key challenges, opportunities, and recommendations, based on the comments given by the respondents.

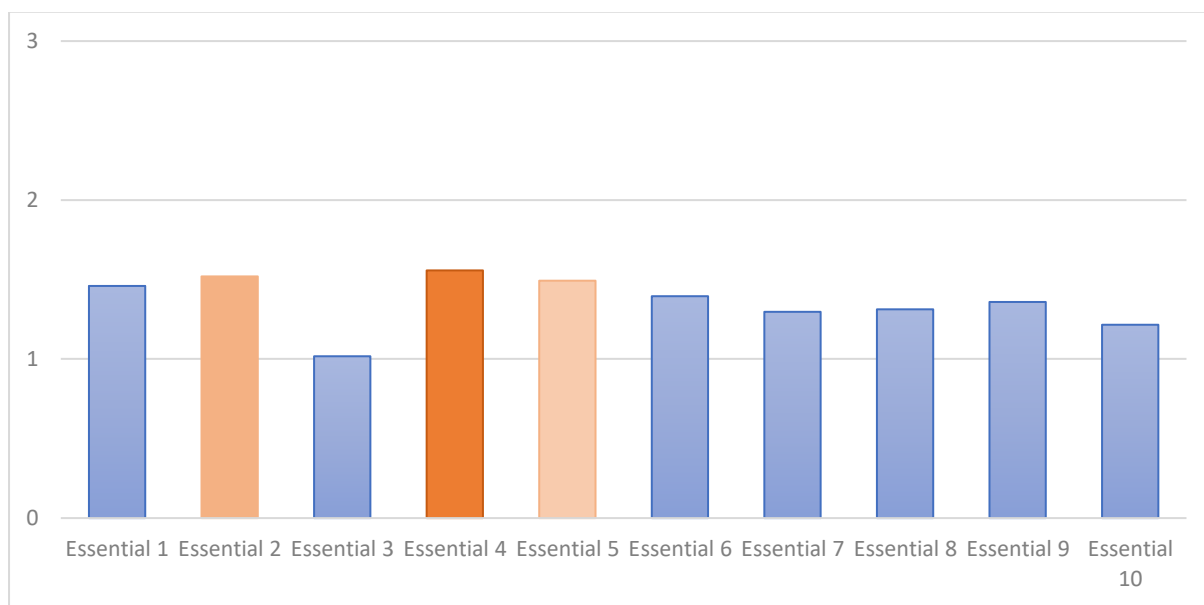
4. Findings

As explained in Section 2.2, the 'Making Cities Resilience' Campaign is an attempt to at raise awareness, invest wisely and build more safely based on the 'Ten Essentials'. The following sections explain the current status and trends of the selected cities in disaster resilience and risk reduction.

4.1 The current state of art and progress made towards city resilience

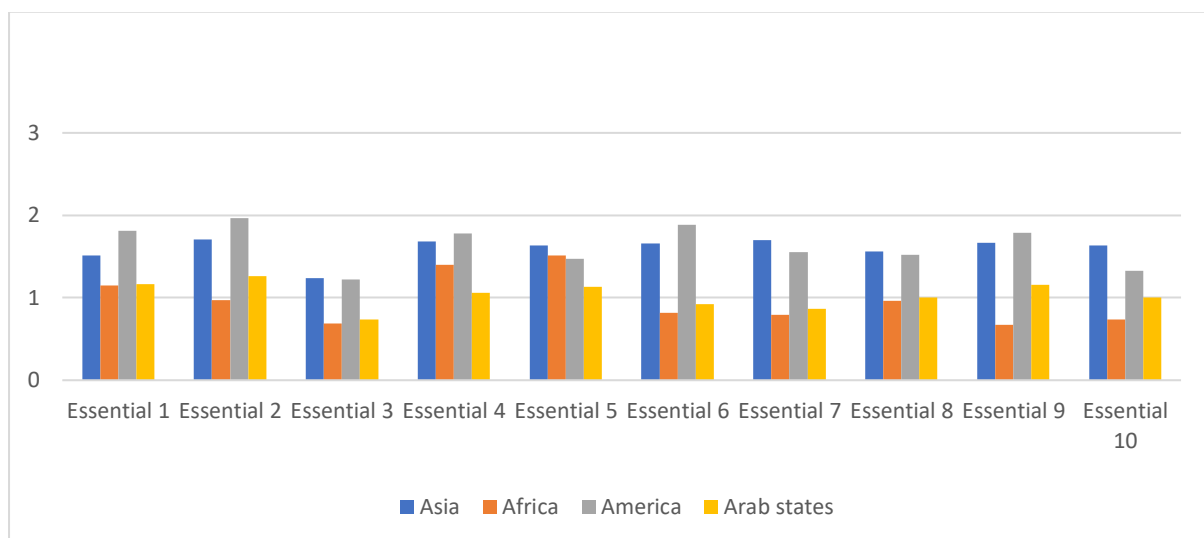
Overall progress of the local governments in the 169 cities is primarily towards Essential 4, which is 'resilient urban development'. This essential includes land zoning and management, risk-awareness planning, design and implementation of new buildings, neighbourhoods and infrastructure, and availability and application of building codes. This is followed by Essential 2, which is to 'identify, understand and use current and future risk scenarios'. This Essential includes five sub-elements. They are hazard assessment, shared understanding of infrastructure risk, knowledge of exposure and vulnerability, cascading impacts, and presentation and update process for risk information. On the other hand, Essential 3, which is Financial Capacity for resilience scored low across the regions. To implement DRR initiatives, substantial resources, including financial and human resource allocations, are required. However, the results show that the allocated financial component does not encourage local governments to include DRR in their initiations. Figure 2 shows the overall performance of the local governments in all regions.

Figure 2: Progress of local governments in disaster resilience and risk reduction (all regions cumulative)



The preliminary scorecard assessment reveals that the most prominent strengths of Asian cities are risk identification, urban development, societal capacity, and preparation and response (Essentials 2, 4, 7, and 9). Recurring flooding, fast economic growth, population concentration and poverty elevation strategies could be some of the reasons behind these progress. The most prominent strength of African cities is their natural ecosystem (Essential 5). Further, the most prominent strength of American and Arab cities is risk identification (Essential 2). On the other hand, the most obvious shortcoming of all the regions is their financial capacity (Essential 3). This shows that securing a substantial budget for disaster risk reduction is a significant challenge for most of the cities. This is most prominent in low and middle-income countries due to population movement from rural to urban in response to better economic opportunities and lack of prospects in rural areas (Amaratunga, Malalgoda, Haigh, Panda, & Rahayu, 2017). Based on the sub-indicators of the Essentials, Asian cities have progressed well in citizen engagement techniques, African and American cities have moved forward in data sharing, and Arab cities performed well in hazard assessment. On the other hand, less performance is identified in providing incentives in Asian cities, interoperability and inter-agency working in African cities, and proportion of private sector/ employers that have a documented business continuity plan in American and Arab cities. Figure 3 shows the progress of the local governments by region.

Figure 3: Progress of local governments in disaster resilience and risk reduction (by region)

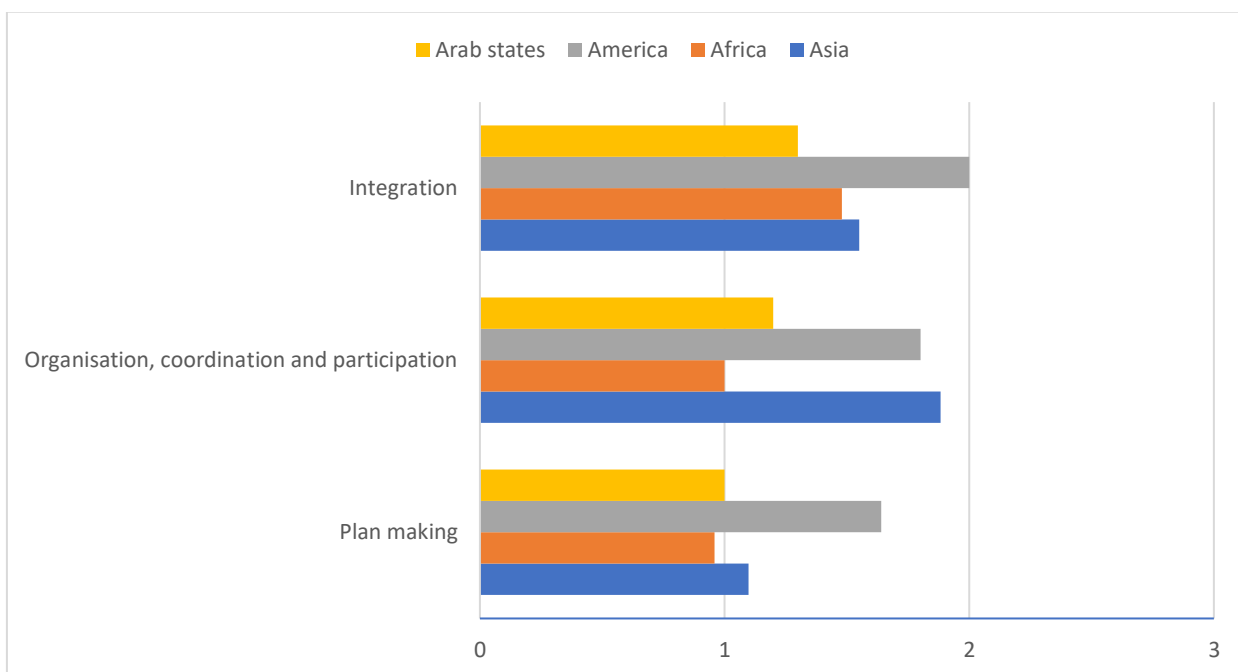


4.2 Global and regional trends in local government

Involving local communities is the key prerequisite of sustainable disaster risk reduction (Gaillard & Maceda, 2009). Thus, local governments play a critical role as they are the closest government body to the local population. The preliminary scorecard assessment reveals some of the well progressed areas of the disaster risk reduction. They are explained below.

4.2.1 Essential 1: Organise for disaster resilience

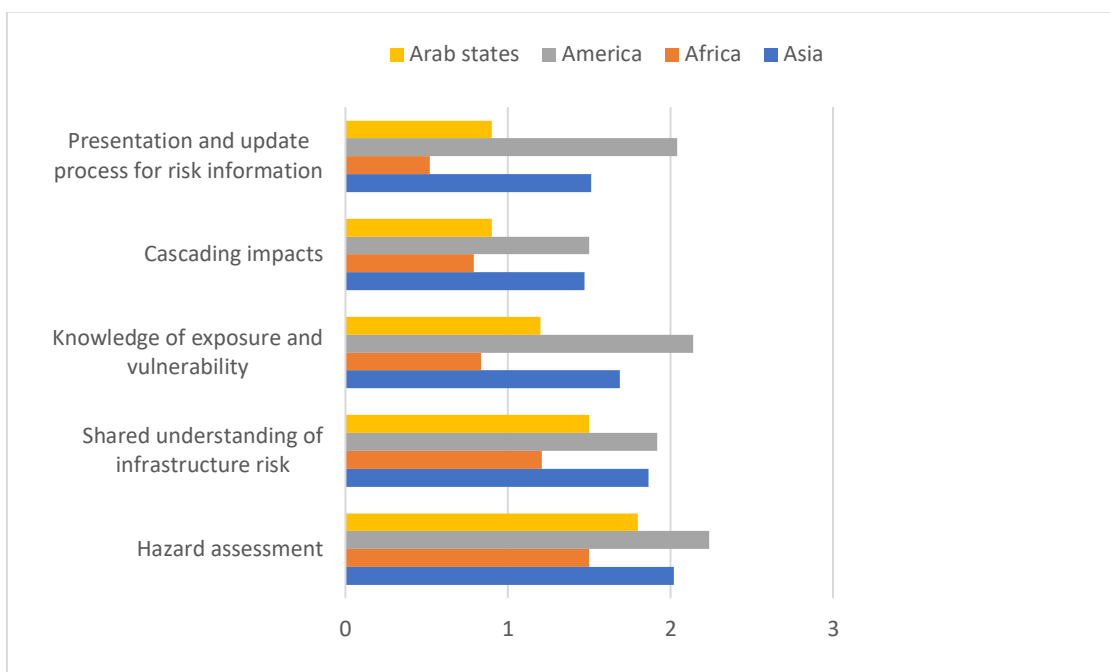
This Essential emphasises on having organisational structure in place and a mechanism to understand the necessary processes and act on to reduce exposure, vulnerability and impact of disasters caused by natural hazards. This Essential includes three sub elements, that includes plan making, organisation, coordination and participation, and integration. Figure 4 shows the progress of the 169 local governments on Essential 1.

Figure 4: Region wise progress on Essential 1

The results show that on average, 85% of the local governments have plans that offer full or partial integration with Sendai framework and covering some of the 10 essentials. Few cities have already achieved the highest level of organisational resilience. Among them, American cities are the pioneers in implementation. 52% of the city teams do not have proper interagency support and are under-resourced to address DRR. Further, the benefits of integration is generally understood in most of the cities across the regions.

4.2.2 Essential 2: Identify, understand and use current and future disaster scenarios

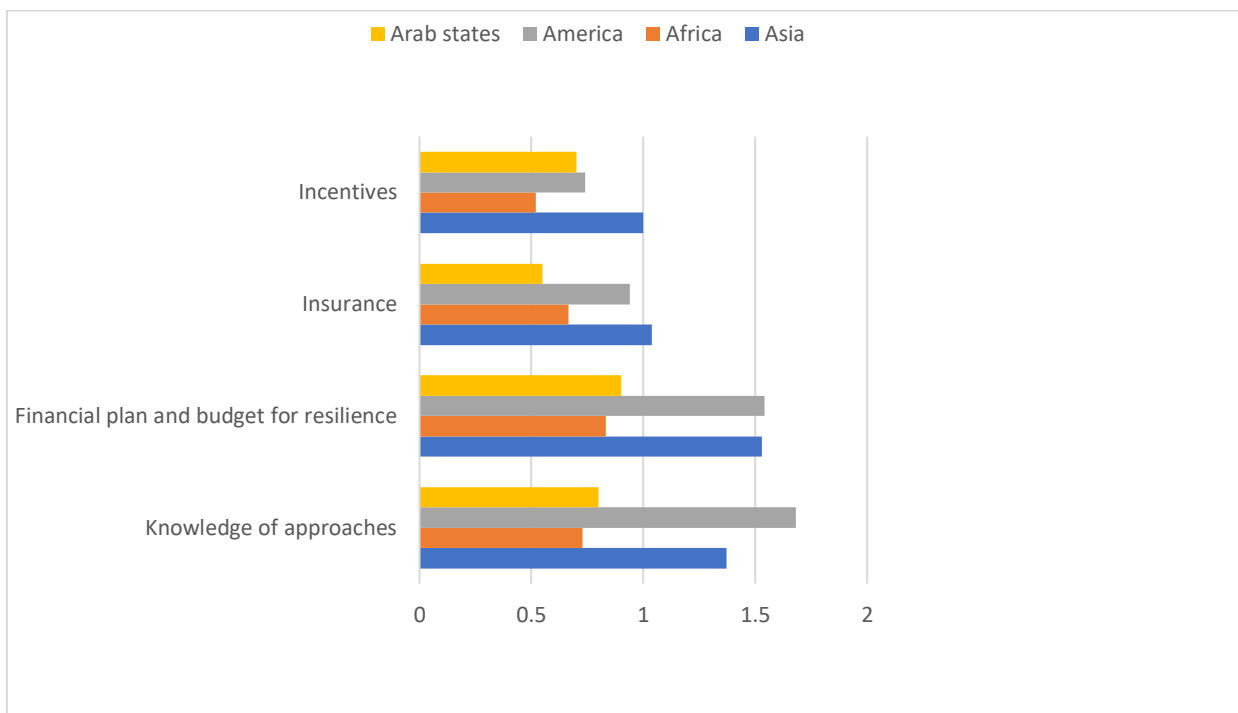
This Essential encourages the city governments to identify and understand their likely risks, including hazards, exposure and vulnerabilities, and use this knowledge to inform decision making. This Essential includes five sub elements. They are hazard assessment, shared understanding of infrastructure risk, knowledge of exposure and vulnerability, cascading impacts, and presentation and update process for risk information. Figure 5 shows the progress of local governments on Essential 2.

Figure 5: Region wise progress on Essential 2

According to the results 76% of the cities understand their primary risks. In addition to disaster identification, shared understanding of disaster risk between a city and its various utility providers are also equally important for disaster risk reduction. The results show that 62% of the cities share their risk information entirely or partially with multiple utility providers. Results further shows that 46% of the American cities have comprehensive suite of disaster information with relevant supporting notes. On the other hand, 41% of the African cities have no disaster scenarios available.

4.2.3 Essential 3: Strengthen financial capacity for resilience

Understanding of the economic impact of disasters and the need for investments that can support resilience activities are foundation blocks for all disaster risk reduction activities. This Essential includes four sub elements. They are knowledge of approaches for attracting new investment to the city, financial plan and budget for resilience, including contingency funds, insurance and incentives. Figure 6 shows the progress of local governments on Essential 3.

Figure 6: Region wise progress on Essential 3

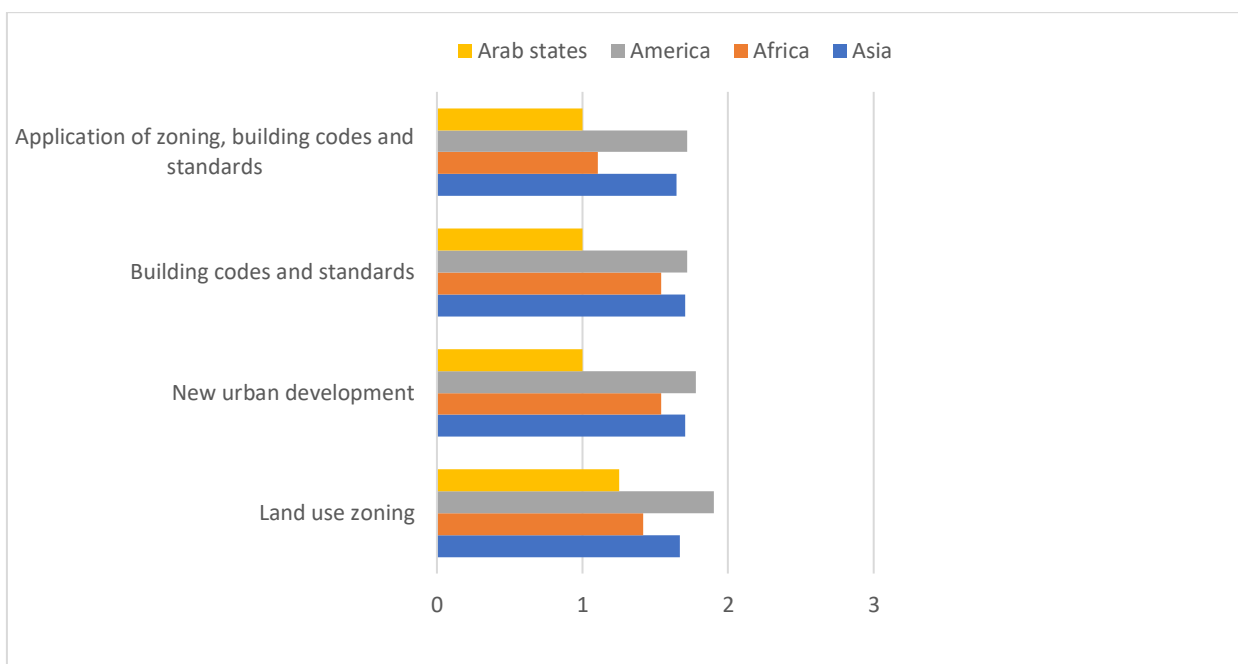
76% of the city-lead agencies/ local authorities have a complete or partial understanding of all routes of funding. Comparatively, American and Asian cities performed better, as 50% of them are at Level 2 and 3. 38% of the cities have specifically ring-fenced budget for disaster risk reduction. However, little or no insurance cover exists in 37% of the cities. Further, few or no incentives are available in 45% of the cities. Urban resilience can be viewed as a unique opportunity for development and poverty reduction of the cities. The discussions on the methods of financing such as embedded and stand-alone funding are widely recognised under international frameworks for the effective reduction of disaster risk. However, this will vary depending on the level of development, exposure and risk for disasters. The importance of embedding disaster risk reduction into national development plans is seen as the way forward under the concept of integrated risk reduction (Kellett et al., 2013). On the other hand, the need for stand-alone funding still remains for high-risk locations.

4.2.4 Essential 4: Pursue resilient urban development

The built environment needs to be made resilient according to building regulations and context related scenarios. This Essential includes land zoning and management, risk-aware planning, design and implementation of new buildings, neighbourhoods and infrastructure, and availability and application of building codes. Figure 7

shows the progress of local governments on Essential 4.

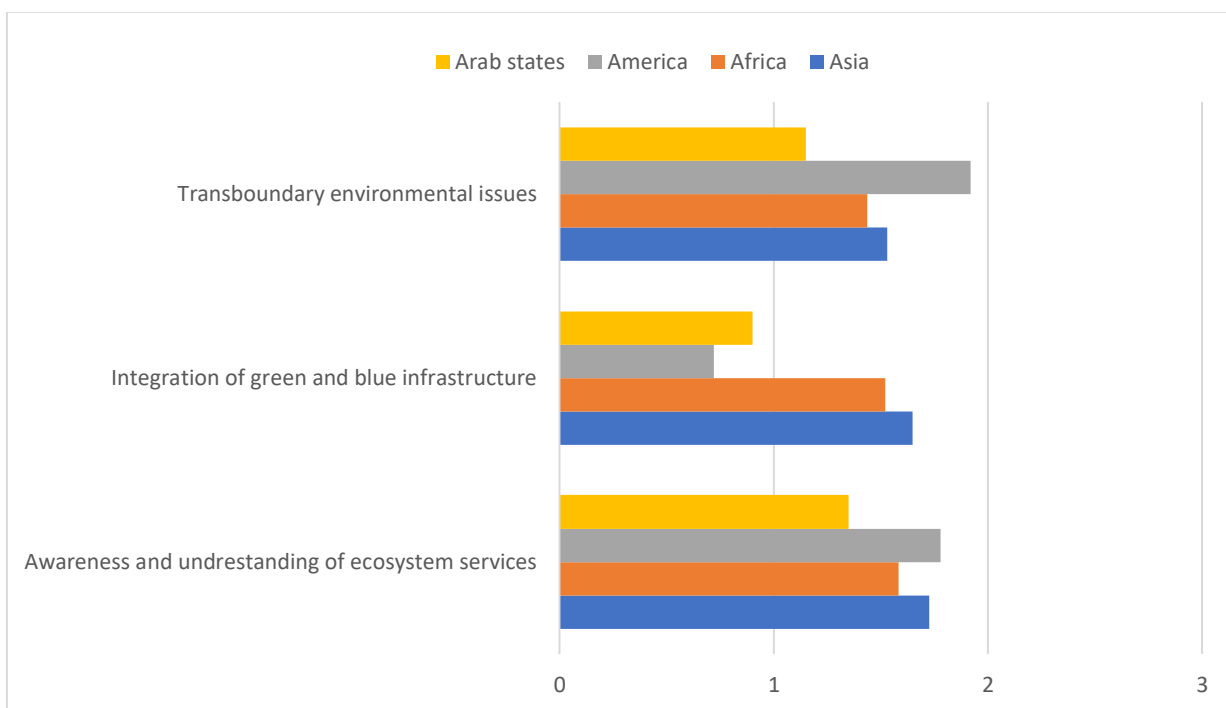
Figure 7: Region wise progress on Essential 4



56% of the cities are zoned according to land use that connects to hazard and risk mapping, as specified in Essential 2. Region wise, Asian and American cities performed better than other cities. New developments require clear policies and guidelines for the practitioners to promote a more resilient urban development. This preliminary assessment shows that 57% of the cities have clear city-level policies. Further, most of the cities show a good progress across regions in the application of building codes for new constructions and developments.

4.2.5 Essential 5: Safeguard natural buffers to enhance the protective functions offered by natural ecosystems

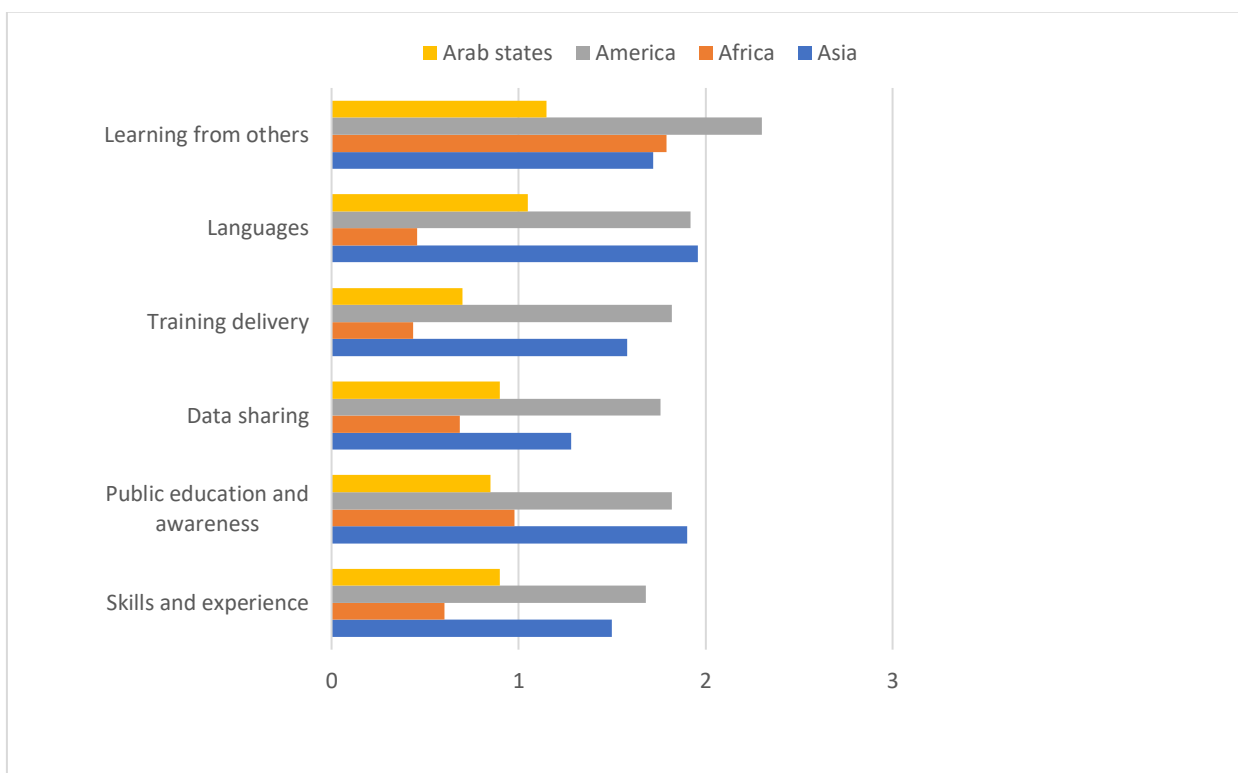
Recognising value and benefits of the natural ecosystem for disaster prevention and protection is essential for formulating disaster risk reduction strategies. This mainly includes awareness of ecosystem functions, integration of green and blue infrastructure, and knowledge of transboundary environmental issues. Figure 8 shows the progress of local governments on Essential 5.

Figure 8: Region wise progress on Essential 5

59% of the cities and key stakeholders are aware of the term ecosystem and understand a majority of functions, including water attenuation, food growing, fuel, carbon sequestration, air filtration, and aesthetic value, each provided by key local natural assets. Further, 70% of the cities promote green and blue infrastructure, and 87% of the city administrations are aware of the functions that are provided by natural capital beyond their administrative borders.

4.2.6 Essential 6: Strengthen institutional capacity for resilience

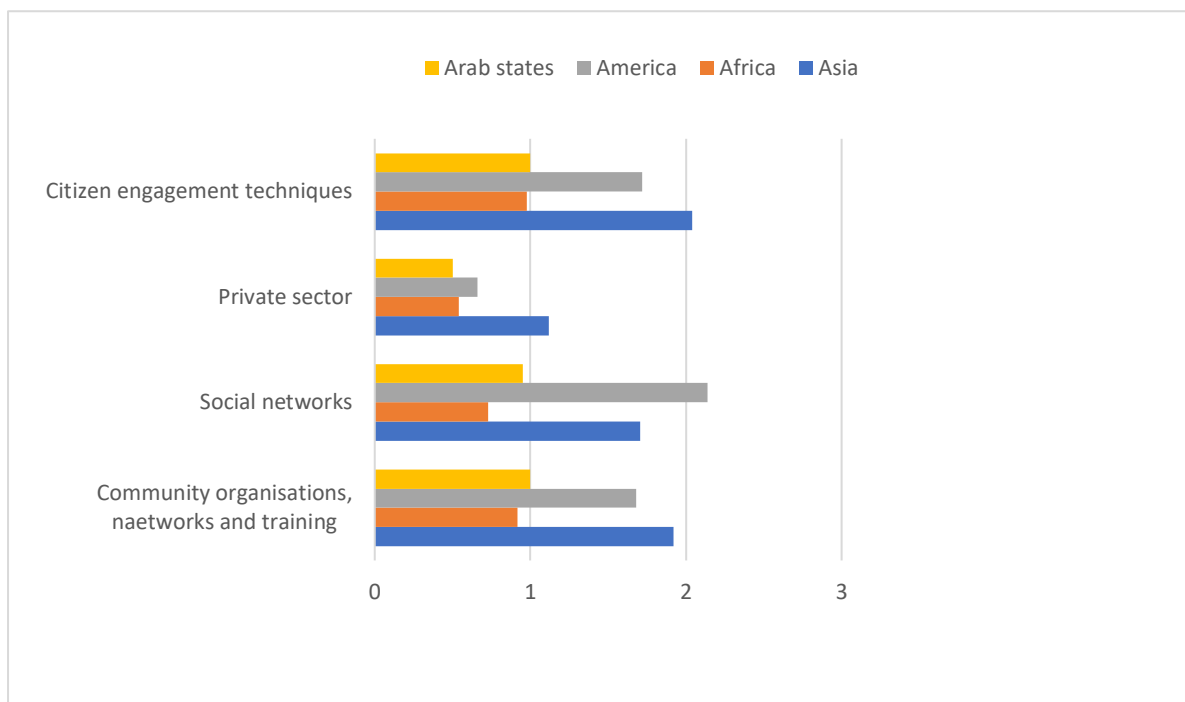
Essential 6 emphasises the importance of ensuring that all institutions relevant to a city's resilience have the capabilities to discharge their roles. This Essential includes skills and experience, public education and awareness, data sharing, training delivery, languages, and learning from others. Figure 9 shows the progress of local governments on Essential 6.

Figure 9: Region wise progress on Essential 6

72% of the cities have access to all or most of the skills and resources to respond disasters. A city's ability to communicate with the public in a structured way, to educate and inform disaster risk information, is also crucial for risk reduction. 85% of the cities run useful programmes and channels to disseminate information to more than 25% of the public. Further, on average, 79% of the cities share some or numerous city data sets with other organisations involved with city resilience. 64% of the city authorities conduct training courses to cover some city disaster risks. In 27% of the cities, all the training materials are available in all of the languages in common use within the city. Findings further show that some of the cities have already achieved the highest level of institutional capacity.

4.2.7 Essential 7: Understand and strengthen societal capacity for resilience

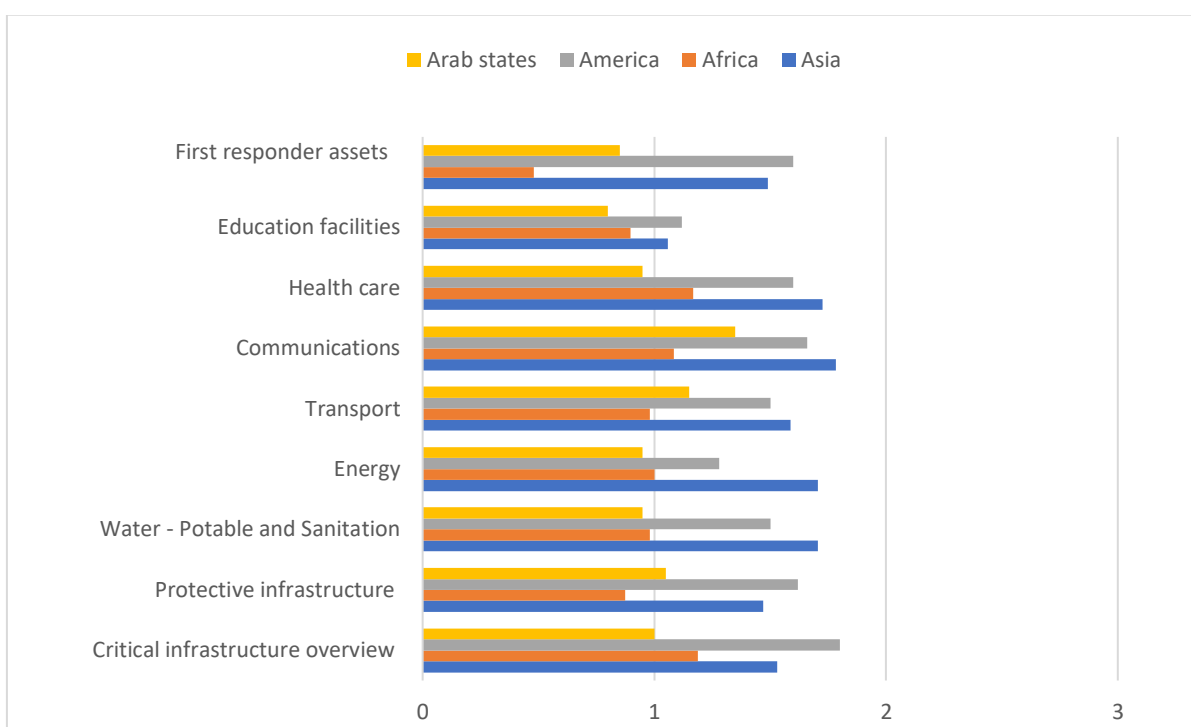
Recognising the role of cultural heritage and education in disaster risk reduction is a tool to promote social connectedness and a culture of mutual help that improve societal capacity for resilience. This Essential includes community organisations, networks and training, social networks, private sector employers, and citizen engagement techniques. Figure 10 shows the progress of local governments on Essential 7.

Figure 10: Region wise progress on Essential 7

In 15% of the cities, community organisations cover a significant proportion of the city's population and actively participate in pre-event planning and post-event response across the city. Further, 78% of the cities developed a mapping of the socially vulnerable population associated with age, gender, race, disability, and literacy. On the other hand, Only 4% of the cities have business continuity plans of 60-100% of the businesses running in the city that have been reviewed within the last 18 months.

4.2.8 Essential 8: Increase infrastructure resilience

Adequacy and capacity of critical infrastructure to cope with disasters the cities might experience and development of contingencies to manage risk are addressed by this essential. This Essential includes critical infrastructure review, protective infrastructure, physical infrastructure, health care, education facilities, and first responder assets. Figure 11 shows the progress of local governments on Essential 8.

Figure 11: Region wise progress on Essential 8

24% of the cities have a forum to establish a shared understanding of risks between the city and various utility providers. In 81% of the cases, protective infrastructures, such as levees and flood barriers, flood basins, sea walls, etc., are in place at least in some places. The level of resilience of physical in the assessed cities is shown in Table 2.

Table 2: Level of physical infrastructure resilience

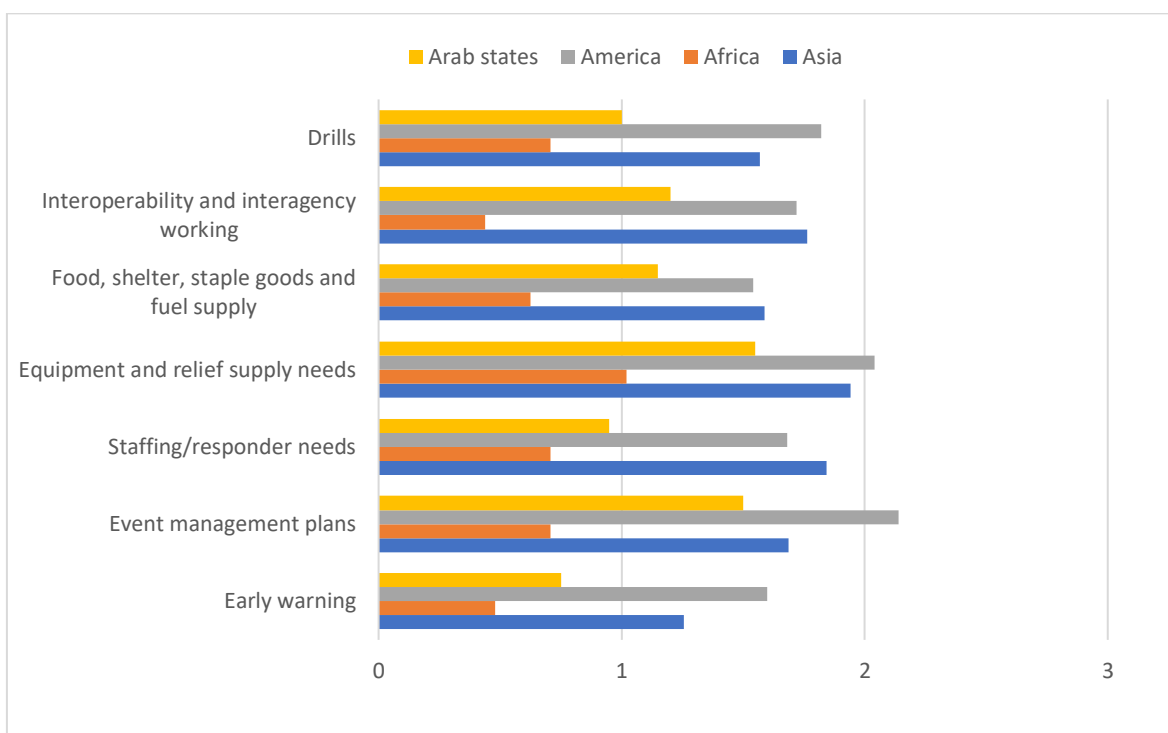
	No loss of service even from “most severe” scenario	Some loss of service would be experienced from the “most severe” scenario	Some loss of service would be experienced from the “most probable” scenario	Significant loss of service would be experienced from the “most probable” scenario
Potable water and sanitation	8%	38%	34%	20%
Energy	3%	37%	45%	15%
Transport	5%	41%	36%	18%
Communication	10%	44%	32%	14%

Regarding social infrastructure, 12% of the cities possess sufficient health care facilities that can treat more than 90% of the injured population in the “most severe” scenario, within 6 hours. In 24% of the cities, no teaching facilities are at risk in most severe and probable scenarios.

4.2.9 Essential 9: Ensure effective disaster response

Availability of detection and monitoring equipment to act on early warnings and forecasts is one of the prerequisites for effective disaster response. This Essential includes early warning, event management plans, staffing/responder needs, equipment and relief supply needs, food, shelter, staple goods and fuel supply, interoperability and inter-agency working, and drills. Figure 12 shows the progress of local governments on Essential 9.

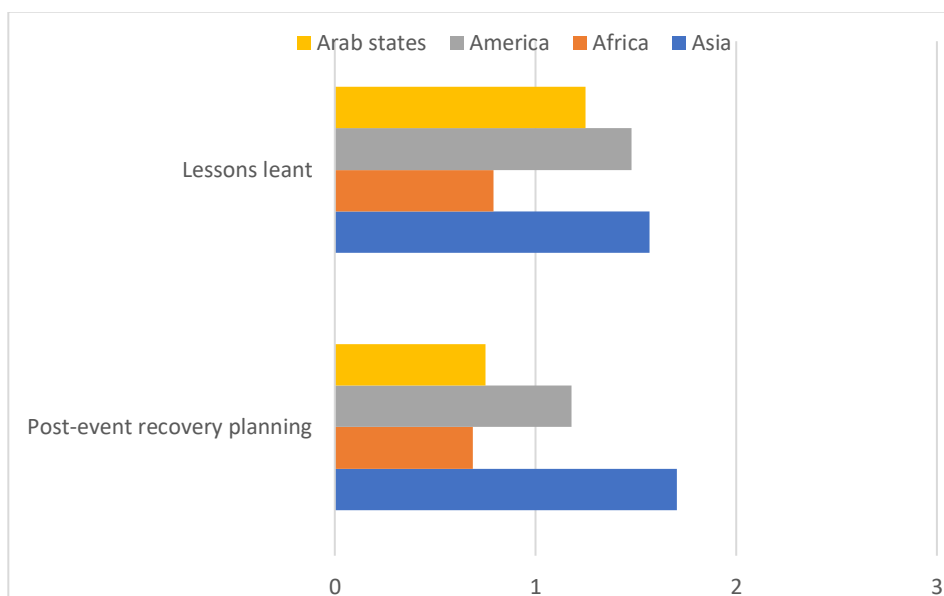
Figure 12: Region wise progress on Essential 9



The preliminary scorecard assessment shows that, in 59% of the cities, more than half of the population is reachable by early warning systems. Further, In 74% of the cities, surge capacity exists to cover all neighbourhoods in less than 72 hours. On average, 88% of the cities have defined the needs for equipment and relief supply. Among them, however, 28% of the cities' need definitions are essentially nominal or guesswork. Regarding practice drills, 44% of the cities conduct realistic exercises that are validated by professionals.

4.2.10 Essential 10: Expedite recovery and build back better

Build back better is a critical element of the Sendai framework and the ten essentials. Thus, effective pre-disaster plans according to risks identified, and captured lessons learnt are essential to support design and rebuilding. Figure 13 shows the progress of local governments on Essential 10.

Figure 13: Region wise progress on Essential 10

Comprehensive post-event recovery plans, such as the interim arrangement for damaged facilities, locations and sources for temporary housing, and economic reboot arrangements, are necessary for building back better. 73% of the cities have some plans in place for post-event recovery and reconstruction, including economic reboot and societal aspects. In addition to pre-disaster plans, post-disaster assessments to capture lessons learned are equally critical in helping a city understand how it can ‘build back better’ and also in improving comprehension of risks. 39% of the cities have clear processes to capture lessons from failure post-event. Further, Asian cities are in the lead, and no Arab cities have achieved the highest level.

4.3 Key challenges in achieving Target E of Sendai framework

The challenges faced by the local governments can be related to governance, resources, stakeholders, policy and plan, and technology. In terms of local governance, the results show that the institutional capacity of local governments is comparatively low in African and Arab cities. Particularly, sharing the city resilience data with the relevant institutions, availability of training courses covering risk and resilience issues offered to all sectors, and access to skills and experience to respond to disaster scenarios are the area cities perform low. However, all regions are proactively seeking to enhance knowledge and learn from other cities facing similar challenges.

To implement DRR initiatives, substantial resources, including financial and human resource allocations, are required. However, the results show that the allocated financial component does not encourage local governments to include DRR in their initiatives. This issue was observed across all the regions. Further, the local governments

encounter deficiencies in skills, competence, and manpower. Studies highlight the disproportionate allocation of funds, where most of the disaster-related funds are allocated for relief and reconstruction work, while the allocation of funds for mitigation is comparatively low (Malalgoda et al., 2016). On the other hand, some local governments highlighted their good practices. For example, according to the ‘making cities resilience’ campaign’s preliminary assessment, the Bangladesh Climate Change Trust (BCCT) funds for DRR activities. The Dohar Municipality of Bangladesh has received funds from this Trust, implementing a project called ‘Towards reducing the impact of climate change adaptation and mitigation’.

Post event recovery and reconstruction planning, and strategy to capture lessons learned that then feed into design and delivery of rebuilding projects are some of the areas that needs improvements according to the analysis results. However, Asian cities are comparatively doing well in these two aspects. Bureaucratic delays in incorporating DRR in city master plans, unavailability of information, and outdated plans are among the key issues related to policies and plans. It can be observed that some cities are not equipped with plans to regulate development.

Local government needs support from various organisations and communities to create cities resilient to disasters. However, some cities suffer from a lack of community engagement. For example, some traditions and habits of the local communities can act as a barrier to implementing certain DRR initiations. Some cities consult the local communities to identify the real requirements of the area, in order to mainstream the risk reduction into regional government planning. However, a minimal consultation of local communities does not represent their participation. A lack of financial and human resources, and a lack of willingness of the communities were mentioned as barriers to incorporating community participation.

4.4 Cases of successful Sendai-compliant DRR strategies and lessons learned from the ‘making cities resilience’ campaign

The results show that all the cities are vulnerable to natural disasters up to a certain extent and the relevant local governments are promoted to involve in disaster risk reduction strategies. However, financial capacity remains as the primary challenge for most of the local governments. The other challenges faced by local governments are also similar among regions, apart from the contextual differences. Following are some of the best practices of the role model cities of the Making Cities Resilient Campaign and that can be followed by other cities to enhance urban resilience.

4.4.1 Amadora: Portugal

Amadora Municipality is one of Portugal's smallest municipalities, which is prone to flash floods, urban fires, industrial fires, landslides, storms and road accidents. As a highly urbanised territory with a population insufficiently aware and sensitised about the risks and hazards. Amadora faces many challenges including growing urban population, weak local governance, insufficient participation of stakeholders, decline of ecosystems, and adverse effects of climate change.

These challenges formed a need to build capacity, identify, assess, monitor and reduce risks to build a culture of safety and resilience. Further, the inclusion of risk, disaster risk reduction and resilience on the municipality agenda also became mandatory. In August 2010 the Municipality of Amadora joined the Making Cities Resilient Campaign to face these challenges and to implement UNISDR's Ten Essentials. Amadora's Mayor created a multidisciplinary team with personnel from different municipal departments by allocating decentralised responsibilities.

Table 1: Decentralised responsibilities for stakeholders

Stakeholder	Responsibility
Academic-scientific entities	Develop a set of studies about risk and vulnerability assessment
Local councils	Promote contacts with local associations and citizens' groups in order to increase their awareness
Municipality services	Facilitate contacts and disseminate information for all municipality: education, environment, urban services
Rescue and emergency	Provide data about disaster losses and support stakeholders' training and awareness for first aid and drills
Public-private entities and private social solidarity institutions	Receive technical support to improve their emergency plan and to provide social and cultural activities about disaster risk reduction to their clientele
NGOs	Support public awareness initiatives, provide free training (first aid; risk, disaster risk reduction and resilience frameworks) to campaign stakeholders

School community	Organise training activities and awareness about risk and disaster. Some schools have created civil protection centres for students to develop skills and facilitate a culture of safety
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These decentralised responsibilities have resulted in an increased interest from stakeholders in seeking information on risks and disasters and improved the municipality's resilience.

4.4.2. Greater Manchester: UK

Greater Manchester joined the United Nations' Making Cities Resilient campaign in 2014. The preliminary assessment reflected the understanding to the officials that resilience is not only about the capacity to navigate one-time shocks, but also how to address the chronic stresses that weaken a city's fabric and which can undermine attempts to respond to crises. Long-term pressures such as income and health inequality, ageing infrastructure and the effects of climate change can slowly reduce living standards and quality for life for everyone, creating a disaster in their own right.

By looking at the complex challenges, Greater Manchester found opportunities for understanding cascading impacts of risks, and closer collaboration in exploring the development of innovative adaptive programmes which can give stakeholders and communities the opportunity to think differently about the way in which Greater Manchester should and could work.

In preparing a preliminary assessment, the city looked at each of the key strategic city-region plans and analysed them against the drivers of resilience as defined within the City Resilience Framework, helping to give a unique mosaic of the current resilience focus across Greater Manchester. This analysis helped them to understand where the resilience strategy can best align with and leverage current initiatives to strengthen our overall city-region resilience. Subsequently, they ensured that Greater Manchester has a solid foundation on which to refresh its resilience strategy. The process has encouraged conversations between a wide variety of stakeholders, improving awareness of resilience issues, strengthening understanding of how our shocks and stresses interlink and building system-wide linkages to deliver resilience solutions that offer co-benefits and efficiencies.

4.4.3 Lisbon: Portugal

Based on the commitments assumed by Lisbon's municipality with the Sendai Framework for Disaster Risk Reduction, and Making Cities Resilient campaign, the resilience strategy under development has prioritised

investment on implementing strategies for disaster risk reduction. To face expected shocks and stresses the municipality defined goals that includes several management, investment, and knowledge sharing strategies.

Further, to measure the city's resilience performance, Civil Protection implemented a web dashboard with a GIS approach, as a complement of the Resilience Action Plan. This platform allows Lisbon to make a diagnosis of the city: identification of its partnerships & public involved in daily activities, understanding of society in terms of disaster risks, the messages communicated, the channels used, and the territories involved. It also identifies the strong and weak points of the strategy adopted and allows the municipality to centralise data, promote the reuse of these data, and reduce dependence.

Based on the characteristics of Lisbon city, the Sendai Framework and an understanding of the resilience process (before, during and after), the municipality invested in educational resources to teach and disseminate the concept of resilience to disaster risks. These include illustrations and pictograms as a universal language, describes the urban resilience process of Lisbon. The social networks and the websites are used to disseminate these messages, and they have already achieved a high visibility.

All these approaches allow Lisbon to monitor and review its resilience process, highlighting the investment made to offer a better city for people to live in the present, and in the future, and to involve them in the resilience process.

5. Conclusions and recommendations

The results of this study is based on the analysis of self-assessment and monitoring tool for disaster risk reduction at the local level known as the “Disaster Resilience Scorecard for Cities”. This allows local governments to understand the local progress towards disaster resilience building, identify their gaps and areas that can be enhanced to strengthen disaster resilience and ensure sustainable development. The Scorecard analysis also supports to create dialogue among multi-stakeholders, which helps DRR focal agencies to engage wider stakeholders in DRR and resilience building.

The analysis shows that the concerned local governments mainly understand and identify the hazards that the city faces, the role of infrastructure, and vulnerability of their cities. Further, cities follow good practices to promote community engagements such as including disaster management in the curriculum, conducting frequent drills, encouraging media participation on publication and data collection on disaster issues and providing adequate

training for healthcare and teaching staff. These initiations can be further enhanced to improve the resilience of the cities.

In terms of finance, establishing government grants, allocating inclusive funding for disaster resilience, increasing viable insurance opportunities and alternative financing are some of the best practices, according to the analysis. Further, updating past scenarios regularly, conducting capacity building training and more precise distribution of roles and responsibilities among employees, and developing comprehensive disaster management plan and relevant information system are some of the frequently mentioned recommendations to improve the current state of urban resilience. The local governments can reflect on these for future changes in their initiations for disaster risk reduction.

However, Target E of the Sendai Framework, which is increasing the number of countries with national and local disaster risk reduction strategies by 2020, will not be attainable unless more attention is given to local governance, stakeholder integration, resource availability, and technology. Concerned local governments reflected that lack of coordination and communication among agencies, limited budget, insufficient information, and limited skilled human resources are the most frequent challenges in implementing the urban resilience initiatives. On the other hand, supportive media, well established and resourced teams, and supportive regulations are identified as opportunities to enhance disaster resilience of the cities.

Ultimately, the capacity of the local governments needs improvements to respond to the growing need for urban resilience and to achieve global targets.

According to Sachs (2015) there are many ways in which ongoing climate change and other environmental changes are interacting with rising populations and more crowded cities to create new risks. It is important for every city to assess those changing risks in a detailed and rigorous way. There is not a fixed blueprint. Each city has distinctive topography, population density, and vulnerabilities. Each city needs to assess its particular challenges. Hazards such as flooding, earthquakes, air pollution, extreme weather events are on the rise. Cities must also plan for a future of rising ecological shocks resulting from human-induced climate change and other environmental change. This is consistent with the idea that humanity has entered a new era, or the Age of Sustainable Development. City officials need forward-looking planning that combines ecology, engineering, and public policy to keep our cities resilient and desirable places to live in the twenty-first century. The good news is that it is possible for cities to overcome these crises.

6. Reference

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