

URBAN RESILIENCE IN SOUTH ASIA



All India Disaster Mitigation Institute

March 2021

Experience Learning Series 77

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Title: Urban Resilience in South Asia

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ABBREVIATIONS

AIDMI	All India Disaster Mitigation Institute
APSD	Association for Promotion Sustainable Development
BUET	Bangladesh University of Engineering and Technology
CBDP	Community Based Disaster Preparedness Program
CoAR	Coordination of Afghan Relief
CRP	City Resilience Program
CSR	Corporate Social Responsibility
DRR	Disaster Risk Reduction
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel on Climate Change
JNU	Jawaharlal Nehru University
MCRC	Making Cities Resilient Campaign
NDMA	National Disaster Management Authority
NGO	non-governmental organization
RMS	Resilient Mountain Solution
SCDR	Special Centre for Disaster Research
SDGs	Sustainable Development Goals
SDMA	State Disaster Management Authority
SES	School of Environmental Sciences
SEWA	Self Employed Women's Association
SFDRR	Sendai Framework for Disaster Risk Reduction
SIDS	Small Island Developing States
SIPG	South Asian Institute of Policy and Governance
SIPG	South Asian Institute of Policy and Governance
SRC	Sustainable Resilient Cities
SWM	Solid Waste Management
TDS	Total Dissolved Salt
UCSC	University of California, Santa Cruz
ULBs	Urban Local Bodies
UNDRR	UN Office for Disaster Risk Reduction
UNFCCC	U.N. Framework Convention on Climate Change
UPAG	Urban Planning Advisory Group
VSCS	Very Severe Cyclonic Storm

OVERVIEW

Resilient Urbanism for the Future

Dr. Ksenia Chmutina,

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The ‘new urban agenda’ has emphasised the need for cities to adapt to climate change, protect their infrastructure and assets, and ensure wellbeing¹ of their citizens, and many cities around the world are now aspiring to achieve resilience. But the notion of urban resilience – just as the idea of a city – is complex and requires careful considerations.

Cities are processes and spaces of configuration of the various social, political, economic and physical elements that constitute power. Here heterogeneous social groups establish and define expectations, interests, needs and rules. The ‘city’ is simultaneously a historical-political entity and a space for a political action and engagement.^{2,3,4} Cities have always been places to

find and exploit opportunities; but these opportunities have rarely been, and still are, equitably distributed among social groups.

In the context of a city, resilience has become an umbrella term to express interest in addressing a myriad of challenges (from climate change to disasters, violence, and terrorism), and to describe a city’s supposedly

¹ Rodin, J., 2014. *The Resilience Dividend: Being Strong in a World Where Things Go Wrong*. New York: Public Affairs.

² Harvey, D., 1996. Cities or urbanization? *City* 1, 38–61. <https://doi.org/10.1080/13604819608900022>

³ Lefebvre, H., 2003. *The Urban Revolution*, 1 edition. ed. University of Minnesota Press.

⁴ Brenner N, Marcuse P and Mayer M (eds) (2012) *Cities for People, Not for Profit: Critical Urban Theory and the Right to the City*. NY: Routledge.

simultaneous capacity to resist, absorb, adapt, transform, recover, and prepare for shocks and stresses. Quite often, urban resilience discourse focuses on acute shocks and chronic stresses and their implications on physical and social infrastructure. The definitions of urban resilience are debated, contested and discussed. Elsewhere, I wrote that urban resilience 'should not be seen as a consensual concept but rather as an unfolding ethical paradigm through which stakeholders create their own dynamic representation and meanings'⁵.

As outlined in this volume, urban resilience could and should be at the

heart of any city planning: from water and sanitation infrastructure, to climate change action, to intersectional inclusive and equitable participation, resilience has a role to play. The articles here show that, when considered carefully and informed by all, resilience can become a useful process. But too often its implementation is standardised and thus promoted as a straightforward and an inherently beneficial, process.

In reality however, whilst resilience is often seen as a 'public good' that is provided to all, not everyone reaps the benefits of resilience in the same manner. The question of power relationships is thus critical - urban

resilience building can often be used to preserve order and enforce the status quo. Taking urban resilience into the future - and making it meaningful - would require considering not just *what* policies are implemented to make cities resilient, but also *where, when* and *how* - and most importantly *for whom* - are they implemented. We thus need to continue to dialogue about urban resilience, emphasising the need to shift the often technocratic aspirations of urban resilience to bring everything back to 'normal' (even when the 'normal' was not desirable in the first place), and instead to continuously ask ourselves whether the city can actually be resilient if it remains unequal. ■



Photo: AIDMI.

⁵ Chmutina, K., Lizarralde, G., Dainty, A. and Boshier, L. 2016. Unpacking resilience policy discourse. *Cities*, 58, pp.70-9

1. UNDERSTANDING URBAN DISASTER RISK

1.1 Making Cities Resilient: Role of Environmental Sciences in Planning

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1.2 Challenges of Making SMART Cities in Himalayas Disaster Safe

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Making Cities Resilient: Role of Environmental Sciences in Planning

Pawan Kumar Joshi, Professor, School of Environmental Sciences (SES) & Chairperson, Special Centre for Disaster Research (SCDR), Jawaharlal Nehru University (JNU), New Delhi, India

The United Nations International Strategy for Disaster Reduction (UNISDR) in 2010 launched a campaign entitled 'Making Cities Resilient' with an aim - 'to invest today for a better tomorrow'. In the light of emerging disasters, which are amplified by the global climate change, the response of cities is gradual and abrupt change, chronic stresses and acute shocks, leading to often collapse. Such impacts often result the state, which demands much more than recovering or rebuilding of such cities. It is clear that a new way of addressing problems of cities is an urgent priority and that it will have to be more efficiently integrated, more sensitive to ecology and community, more open to uncertainties and respectful to citizen involvement, basically resilient.

Resilience needs to be fundamental at all levels of urban ecosystem processes and management, involving cities and their communities, municipal authorities and their institutional arrangements, architects and urban planners, firms and enterprises, communities and citizens. Yet it is to be realized as paradigm of smart planning for making cities resilient. A city is the most complex and typical socio-ecological system, shaped by human beings, which is vulnerable to global environmental changes including climate change. In the recent past, we have become increasingly aware of the multiple risks (higher

temperatures, sea level rise, intense rain, flashfloods and heat waves) that climate change poses to our cities. Furthermore, we have witnessed how natural disasters have cost lives and destroyed urban spaces and communities. It is clear that in order to reduce the risk and impact of these threats and to increase the safety and well-being of their residents, cities and their communities must be more resilient and prepared to address the threats head-on.

The concept of resilience, in the urban context, was borrowed from studies on the manner in which ecological systems cope with stresses and disturbances caused by external factors. Thus, the role of environment sciences and ecological principles in planning of urban dimension appears to be novel and most sought-after today. In fact, it was a common praxis in the past. The vernacular settlements were sensitive to local microclimatic conditions, thus designs and layouts were considerate to availability of air, water and sunlight. Such climate sensitive architectures were conducive to demands needed in all kinds of environmental conditions and even the unexpected changes thereon. However, increased complexity of urban ecosystems and multitude of climate related changes have reduced the possibility of reshaping climate-friendly structures, unless intervened with principles borrowed from natural ecosystems.

The ecosystem approach is required to understand the need and demands of city metabolism, and adopting nature based solutions in urban planning mechanism need to be comprehensively implemented in such a city. The mechanism needs to follow the processes of identifying strategic aims and objectives while enabling participatory approaches of knowledge and data collection and decision making processes. These are needed for adopting appropriate land use policy, sustainable architecture codes, environmentally cordial quality of life, and integration of provisions and regulations that encourage increased implementation.

The mission could be achieved using multi-disciplinary theory that integrates a variety of urban dimensions such as social, economic, cultural, environmental, spatial and physical infrastructure, into a unified conceptual framework for understanding the resiliency of cities and how they should move towards a more resilient state. This would certainly need regulatory innovation, strengthening governance and implementation of smart planning for built environment. Environmental science, being multi-disciplinary in nature, can serve as the nodal subject capable of developing and integrating climate sensitive checks into each contributing dimension of the smart cities mission. ■

Challenges of Making SMART Cities in Himalayas Disaster Safe

Dr. Mamta Mokta, Professor in Dept. of Public Administration, Himachal Pradesh University, Shimla; and Shriya Mokta, Research Scholar in Department of Political Science, Himachal Pradesh University, Shimla, India

Equitable, efficient and Healthy Resilient Smart cities having the capacity to cope, respond, recover, restore and self-heal needs to be developed in Himalayan areas also. Globalization, climate change and population dynamics are the main drivers of change in mountains and have led to a change in the livelihoods of the people and increased their economic and environmental vulnerability. The following challenges in Himalayan regions are hurdles in the way of developing disaster safe resilient cities.

Challenges

- 'Inaccessibility' imposes restrictions on development interventions and aggravates the impacts of disasters. Unplanned Urbanization and Climate change in Himalayas is the biggest hurdle in making resilient SMART cities.
- Scientific evidence shows that most glaciers in South Asia's Hindu Kush Himalayan region are retreating, the effects of future climate change could further exacerbate water stress as it was faced by water crisis of SMART city Shimla.
- Indian Political, governance and Planning systems as structured today are not adequately sensitized and trained to deal with issue of resilient Smart City.
- Urban Governance in rapidly urbanizing countries of Himalayan region is often poorly organized. Emerging Smart City Governance in Himalayan regions is entangled with institutional compartmentalization due to poor convergence and integration mechanisms.
- Absence of Single window civic service centre at the municipal corporation to facilitate and dispose of all kind of applications and grievances is lacking Smart cities governance has fallen short



of addressing the systematic capacity building needs and strengthening of local municipal bodies.

- Lack of coordination between SPV driven Urban Government and stakeholders undermine the process of empowerment of Urban Local bodies.
- Gender equity in resilient city Planning is not properly understood and is ignored.
- Extreme wind, ice, snow, and extreme weather conditions, Power outage and Blackout during extreme weather conditions poses a threat to SMART Grid of resilient Smart city.
- Keeping into consideration above challenges following suggestions are given for making resilient Smart cities.

The Roadmap Ahead

Resilience alliance, Local Resilience Forum and Regional Resilience Team for Resilient Mountain Solution (RMS) should be engaged at each level of governance.

Himalayan Resilience Policy needs to be framed. SMART City advisory

Every SMART City is going to be Resilient for that we need to step from Reactive to Proactive we can master it if all stakeholders move together.

forum must meet regularly with SPV for collaborative governance.

Resilient infrastructure, energy efficient building, smart electric grid can be developed. Jute and Plastic should be used for road construction. Concept of Resilience Bond that transfer risk from risk holder to a set of investors made applicable to infrastructure Development. Region Committed Leadership who must be sensitized about resilience planning so that they don't raise voice for legalization of haphazard construction in the name of retention policies to woo the voters.

Better Provision for pedestrians, bicyclist and other environmental friendly Transport needs to be developed. Vetiver grass which has deep, penetrating and extensive root system must be raised on sloping land prone to landslide.

Capacity building and training of all stakeholders needs to be undertaken to prepare Disaster resilient force at all levels. Engaged Communities Social Capital Credit mode can be popularized. It is realized that if the resilience and wellbeing of mountain systems are not maintained and built up, then it is likely to impact resilience capacities in the downstream populations as well. ■

Impact of Climate Change on Ahmedabad City: Key Features and Action Agenda

Darshini Mahadevia, Professor, School of Arts and Sciences, Ahmedabad University, Ahmedabad, Gujarat, India

Ahmedabad, a city with about 7 million population, and the seventh largest in India, is located in a hot and dry region of Gujarat. The city receives rains for about 2 months in a year when entire year's water requirements have to be stored for domestic, public, commercial and industrial purposes. The city's water requirements are met in an unsustainable way; water is sourced from rivers Sabarmati that passes through the city, Mahi River of central Gujarat and Narmada River of south Gujarat, besides pumping out ground water from below 600 ft to 800 ft. The ground water is highly salty, with the Total Dissolved Salt (TDS) level of more than 1000 parts per million (ppm). Hot and dry weather means that water would be required for multiple purposes including keeping the houses and buildings cool during peak summer months as well as watering the green spaces. Besides, climate change is creating conditions of long spells of heat that dry out existing water sources and short spells of heavy rains that cause floods. The first issue therefore for a climate resilient city is to have a sustainable water management, to which I will come shortly.

The second major issue in the city, induced due to the climate change is increase in average temperature during peak summer months, noted to be about 1.7° C during 1982-2018 period. The Urban Heat Island (UHI) impacts can be seen in particularly the eastern part of the city with concentration of industries and low-

income housing (having metal/ tin roofs). The local surface temperatures can go as high as 55° C during peak summer period. The fall out has been on human health, leading to increase in morbidity and mortality. For examples, the May 2010 heat wave was associated with a significant increase in all-cause mortality; 4,462 all-cause deaths occurred, comprising an excess of 1,344 all-cause deaths, an estimated 43.1 per cent increase when compared to the reference period (3,118 deaths)⁶ (Azhar et al., 2014). In summer 2017, of the 10,135 heat-related emergencies handled in Ahmedabad by emergency ambulance service during April-May 2017, abdominal pain constituted 25 per cent followed by unconsciousness (22 per cent), victim falling (15.2 per cent) chest pain (11.9 per cent) (TOI, 2018)⁷.

The sustainable water management would require the following actions:

- i) Water is essential for coping with heat, besides it being required for all daily purposes. Thus, sustainable water management system has to be made mandatory at the city level.
- ii) For sustainable water management, revival of the traditional rainwater harvesting structures, a feature of the historic city of Ahmedabad, and replicating such systems in all parts of the city, particularly the new developments, will be required.
- iii) City will also have to construct, community/ area level water harvesting systems through

channelling rainwater drains to recharge ponds/ lakes or even newly created percolation wells. Existing wells in the city could be converted to become percolation wells.

- iv) Increase in green cover from present 2 per cent of the total land area to at least 10 per cent, which would assist in recharging the underground aquifers.
- v) For heat, proofing, metal/ tin roofs of all low-income housing areas need to be replaced with heat-reflecting or heat-resisting roofs.
- vi) There is a need to increase open spaces, as these help in reducing local heat islands.
- vii) Regular monitoring of temperatures at local level.
- viii) Creation of heat-proof shelters for those who are homeless or are working on the streets such as the street vendors, construction workers, etc. for resting during peak heat period of the day. These should be constructed by the municipal authorities using funds from national government programmes and run in partnership with the civil society organisations.
- ix) Stand-alone climate change responses may not succeed. Urban heat resilience requires a comprehensive approach – mainstreamed in urban policies, planning and design that collectively influence built form and green cover. ■

⁶ Azhar, G. S., Mavalankar, D., Nori-Sarma, A., Rajiva, A., Dutta, P., Jaiswal, A., Sheffield, P., Knowlton, K., & Hess, J. J. (2014). "Heat-related mortality in India: Excess all-cause mortality associated with the 2010 Ahmedabad heat wave". *PLoS ONE*, 9(3), 1-8.

⁷ Times of India (2018). Heat emergencies: City worst hit 'Abdominal Pain Tops the Chart of Cases'. *Times of India*, 02 April. Retrieved from <https://timesofindia.indiatimes.com/city/ahmedabad/heat-emergencies-city-worst-hit/articleshow/63571626.cms> (Accessed 27 April 2019).

Community Based Disaster Preparedness: The Past is the Key to a Safer Future

Dr. Pooja Paswan, Assistant Professor, Department of Political Science, Jamia Millia Islamia, New Delhi, India

Disasters are inevitable phenomena in today's time and age. While disasters may not be the necessary result of hazards, more often they occur when these hazards intersect with the environment, particularly inappropriate location, inadequate infrastructural development and lack of capacity building of communities to deal with the disaster. Since the ability of the built environment to withstand the impacts of hazards plays a direct role in determining the casualties and monetary costs of disasters, it is important to reduce the vulnerabilities within the built environment and enhance its capacity for disaster mitigation and reconstruction to achieve resilience to disasters.

Communities are the first line of defense

Community participation is the most effective element to achieving sustainability in dealing with natural and man-made disaster risks. Sustainable development and disaster reduction are essential preconditions for each other. Natural disasters severely hamper the progress and achievements of sustainable development while, at the same time, physical infrastructure that we are

constructing may itself constitute a source of risk in the event of future disasters. This is particularly true in the case of earthquakes, where the majority of victims are killed by their own collapsing houses. From the perspectives of environmental degradation, human intervention, and security aspects, disaster management is a pressing issue for all of us and should be undertaken on a comprehensive basis. The approach seeks communities at risk to get engaged in all of its phases: prevention, mitigation, preparedness, response, and recovery. In order to build disaster resilient communities, they need to be empowered first so that community members can cope with the adverse effects of natural hazards. This is the most effective approach to achieving sustainability in dealing with natural disaster risks.

Disaster is the Ultimate Equalizer

India with a coastline of 7516 kms is vulnerable to cyclones of varying intensities. HUDHUD a Very Severe Cyclonic Storm (VSCS) hit the east coast at Vishakhapatnam on 12th Oct, 2014.

Although it was not the most severe cyclone that hit the Indian coast,

however, it has been the most devastating one in recent times which made landfall in an urban area. Its 'eye', lay exactly over the city causing tremendous loss to life, property and natural resources. However, the human casualties were restricted to the minimum. This can be attributed to the sustained preparedness and mitigation measures undertaken in the past, and effective and timely response initiated by Central Government and State Government(s), right from the early warning stage.

National Disaster Management Authority (NDMA) deputed a team to visit the HUDHUD affected districts of Andhra Pradesh and Odisha to have firsthand information on the good practices followed and to identify gaps and lessons learnt for better preparedness, pre-event mitigation and response/relief operations, to prepare better for future cyclonic events. National Disaster Management Authority (NDMA) makes continuous effort to which are documented as "good practices for effective and coordinated response for cyclone disaster risk management.

Since then the eastern coastline has shown a high resilience and effective disaster mitigation in terms of issuing early warnings, better pre disaster preparedness, community based disaster response and advance administrative preparedness. The National Disaster Management Authority (NDMA) along with State Disaster Management Authority (SDMA) provides collective support in local capacity building to bolster the first line of defense: community. We mustn't forget "preparedness is the only way we can combat a natural disaster". ■



Role of Media in Disaster Management

Dr. Jaishri Jethwaney, Senior ICSSR Research Fellow & Visiting Professor-ISID, New Delhi, India

Disaster management is a specialized function, which cannot be accomplished well unless the media, especially the news media is taken on board during the various stages of a disaster, so as to reach out to various stakeholders. What should the messages contained during the various phases is explained below:

Three phases in disaster crisis communication

- a) Pre-Disaster (warning/ advice on preparedness, government's plan for evacuation, etc.)
- b) Disaster period (rescue work, mitigation, succor)
- c) Post- Disaster (resettlement and rehabilitation)

The news media is often referred as the Fourth Estate in a democracy. It is believed that the extent of democracy can be gauged from the extent of freedom the news media enjoys in the country. India can boast of having the most robust media, with high reach and accessibility. There are various negative perceptions about media, but there is no escaping from media, in the information age. Media is often criticized for feeding on the crisis. Bigger the crises, the better the media practitioners feel, because it gives them the opportunity to showcase their alertness in bringing the issue out in the public domain; pull up authorities in their watchdog function to get closer to their viewers/readers and of course the TRPs rise as more and more people sit glued to their television sets. In the aftermath of a crisis, or even while a crisis has not subsided, getting hold of information and as fast as possible, is very important for the media. Due to fierce competition

among various news channels, every channel wishes to give the "breaking news", so much so that the expression has lost its relevance!

News media is often pulled up for being sensational in its narrative and criticized for seeing things, which may not even exist. The coming of the digital media, especially the social networking sites have brought a floodgate of content on various issues with biases and extreme stands of all kinds. Social media information is sans filters. In contrast, when news comes from the various media houses who exercise edit control and have the filtration process, there is obviously accountability coupled with responsibility. While it is difficult to control user-generated content (UGC) on the digital platforms, the disaster management authorities need to depend on the news media in disaster management by sharing with them information in a timely manner to fulfil their information dissemination goals. The authorities as a parallel exercise should also update their website to provide their plan of action and data on a continuous basis during all the phases of a disaster.

It is important to understand the DNA of news media to appreciate its role and function, especially in the face of a calamity/disaster. The raw material for journalists is information, for which they literally would 'beg, borrow or steal' as goes the maxim, to write their story. It is important to understand the genuine needs of the scribes so that they could be provided with relevant and timely information. News enjoys more credibility than other forms of

communication including advertising and publicity. Therefore, there is no avoiding or evading media in a crisis time.

What are the lessons for disaster/crisis managers?

- Develop a strategy based on worst-case scenario
- The vital importance of pre thinking
- The initial critical few moments when a crisis breaks are very important.
- Be alert on graphics.
- Know the media mind and stand on the issue
- Isolate the crisis team from the daily grind.

Failure in a crisis handling happens due to one or all the following reasons:

- Lack of openness, honesty, or availability of spokesperson in the initial period.
- Failure to prepare for the worst case.
- Failure to share information timely to let the grapevine develop
- Failure to communicate honest, human emotion and concern.
- Short sightedness of the organization in putting long-term goals before short-term goals.

In summation, it can be said that news media has an important role to play as a responsible partner in disaster management. Reaching out to media only in times of crises and not on a regular basis gives rise to misunderstanding and less appreciation of each other's role and commitments. ■

Making Chennai Climate-Resilient: Learnings from Water as Leverage

Dushyant Mohil, Program Manager-Partners for Resilience, Wetlands International South Asia, New Delhi, India

The flooding event in 2015 and drought in 2019 has brought international attention to Chennai, the capital city of Tamil Nadu. Once known as the 'City of 1,000 tanks', Chennai now has one of the lowest per capita water availability among the major Indian cities. Last summer, trains of water were brought in as the city's water structures have run dry. It is very difficult to see a city where water forms an integral part of its culture (temple tanks exhibit the importance of water bodies), to a city where the tapped water supply has become a dream.



Growing Pains

Chennai houses some of the largest wetland systems in South India and until the 1980s 80% of the city was covered by wetlands. Now that number has reduced to only 15%⁸. Historically, the wetlands were important in providing Chennai with water during drought but are lost to urban expansion. The wetlands in the city are surrounded by areas where economic development is rampant and the pressure to build on them is enormous. Recent development such as the boom in the IT industry and construction of the MGR highway all cut across the wetlands altering the water systems of Chennai. The Pallikarnai marsh, situated in the heart of Chennai has shrunk extensively (90%) owing to ever-expanding real estate, industrial development pressures and dumping of waste. Development initiative like the newly constructed Ennore harbour, has further aggravated wetland loss. The

degradation of wetlands was a significant factor for the extensive damage during the floods in 2015 with economic losses amounting to over \$ 2.2 billion.

Urban expansion has defined Chennai, leading it to great economic heights. Still, the infrastructure has come at a cost, altering the drainage systems, loss of wetlands and overexploitation of groundwater. As boreholes dig deeper looking for water, geological layers are punctured limiting groundwater recharge. The rivers natural functions are lost, and they currently serve as open sewers with heavy pollution. Flood protection measures such as embankments have further isolated the rivers in the city from its surrounding.

Moving Ahead

In recent times desalination plants have received greater recognition, whereas the natural water systems, need immediate attention. Though

efforts like the Coom river restoration and Pallikarnai Marsh Management plan have been initiated, they lack innovation in terms of integrated approaches. To move ahead, the city master plan may need to place greater emphasis on wetland conservation along with a network of blue and green infrastructure.

The *City of 1,000 Tanks* design team as part of the Water as leverage initiative intends to develop a closed-loop water system across the City (Chitra Nagar, Mylapore, Koyembedu and Mambalam) by collecting rainwater, treating wastewater and runoff pollution with decentralized Nature-Based Solutions (such as constructed wetlands), and recharging both to the underground aquifer. The system will aim to prevent droughts support groundwater recharge, reduce pollution and mitigate flood risk. With over 50% of the city currently using groundwater to match its need, groundwater recharge is quite critical for the city. ■

⁸<https://timesofindia.indiatimes.com/city/chennai/80-of-Chennai-was-wetland-in-1980s-now-15/articleshow/54010947.cms>

Social Dimensions of Making Smart Cities Disaster Safe: A View from Colombo

By *Siri Hettige*, Emeritus Professor of Sociology, University of Colombo, Sri Lanka

Economic globalization in recent decades has been largely facilitated by neo-liberal economic reforms in Asia and elsewhere. The process that has also been aided by the spread of new communication technology is accompanied by rapid urbanization in many countries.

Some of the rapidly expanding cities are very large, often over ten million people, and therefore, are widely referred to as mega cities today. Though large cities in smaller countries like Sri Lanka are not as large, and these have also expanded rapidly, from their small beginnings a half century or so ago. Colombo, Sri Lanka's capital city is an example. With a population of just over 300,000 at independence in 1948, its population has consistently increased and has more than tripled in recent years. On the other hand, it is inappropriate to talk about Colombo simply focusing on its old city limits, as the city has expanded outward and the Colombo metropolitan area today accounts for about 3 million inhabitants. The patterns of urban development have been divergent across continents, but there have also been certain trends that are similar across countries. The brief account on the expansion of Colombo given in this article outlines the pattern of urban growth there.

Recent expansion of cities like Colombo has been due to their increasing importance in the development process, not due to any systematic, pre-conceived urban

planning. Expansion of service industries following economic liberalization since 1977 such as export-import trade, retail trade, construction, tourism, banking and finance, health and education services, telecommunication, etc. directly contributed to both rapid population growth and re-allocation of urban space in favor of the built environment. More and more people from all walks of life migrated from rural areas to the Colombo metropolitan region. The expansion of the city has been largely due to private capital investment, both local and foreign. Increasing land prices have forced low income groups to either live outside the city and commute daily or move into congested disadvantaged settlements in and around Colombo. Increasing pressure on land has also encouraged conversion of open public spaces including wetland areas into commercial and residential development, making many parts of the city vulnerable to flooding and other hazards. Increasing density of population has also led to environmental pollution, inadequate public services such as public transport and safe waste disposal.

The developments outlined above have raised serious questions about sustainability, inclusiveness, livability, adaptability to climate change, and equitable access to not only services such as housing, transport, open space, health and education but also life chances for

many residents such as decent work, healthy food and protection from natural disasters and communicable diseases like dengue, which has become a major epidemic in recent years, affecting over 100,000 persons in recent years.

Sustainable development Goal 11 refers to inclusive, safe, resilient and sustainable cities. More recent SMART city initiatives in many urban areas including Colombo intend to use modern technology to make cities more efficient, resilient and sustainable. Yet, recent developments in Colombo have not been in line with the key social dimensions of sustainability. While the expansion of the urban informal sector and casual employment has militated against the creation of decent work for poor people, preventing their integration into mainstream society. On the other hand, the marginalization of many people in the context of private sector driven urban development has exposed them to natural and other hazards like floods, epidemics and displacement. With limited financial and other resources, poorer residents in disadvantaged settlements are not resilient due to grossly inadequate urban public transport, low income housing and common natural resources such as green space. Such conditions have not only made urban growth increasing unsustainable but also necessitated a change in urban development policy in order make Colombo an inclusive, safe, resilient and sustainable city. ■

Barriers of Urban Resilience in Nepal

By Dr. Suman Kumar Karna, Urban Governance and DRR Specialist, Kathmandu, Nepal



Nepal, one of the most disaster-prone countries in the world, is exposed to multiple hazards such as earthquakes, floods, landslides, fires, heat and cold waves, lightning, windstorms, hailstorms, droughts, and epidemics. Nepal is also one of the top ten fastest urbanizing countries. From 58 in 2014, the number of urban municipalities has increased to 293 in 2017. The rapid urbanization is giving rise to different types of risks that are threatening the lives and livelihoods of the people. In the absence of suitable policy for regulating and managing this sudden growth; the urban centers are growing haphazardly, without following the basic principles of planned and sustainable urban development. This situation is causing numerous problems, including; over-crowding, deficiencies in basic urban services; traffic congestion, load-shedding, environmental degradation; encroachment on public lands, forests, and river banks; and sprawling settlement development and so on.

Disasters triggered by natural hazards are causing heavy loss of life and assets, and represent an unparalleled threat to Nepal's development. The effects of climate change and extremes have further aggravated the country's disaster

vulnerability. The government's attention and efforts to disaster risk reduction and management is very limited. The situation has slightly changed after the mega earthquake of 2015, which killed approximately 9000 people and demolished more than one million houses along with other essential infrastructures and services. Nepal is in the 4th year of implementing 10 billion USD, multi-sectoral and multi-dimensional recovery and reconstruction programme in the earthquake affected districts. Post-earthquake 2015, the knowledge and awareness of local public and also the government, has significantly improved while the latter is comparatively more serious and inclined to fix this sector for the optimal use of scarce resources and sustainable development of the country. The recent developments like; implementation of recovery and reconstruction programme, promulgation of DRRM Act 2017 and LG Operation Act 2018, formation of NDRRMA 2019, adoption of new act by provincial and local governments, further reinforces the progress of this sector.

In support of the government move, the Development Partners have also shown their generosity and extended their support to further strengthen and consolidate the progress and

efforts put into reducing and managing disaster risk by engaging the larger gamut of partners and stakeholders including local communities on the ground. At present, Nepal is passing through a phase of profound transition. With the introduction of a federal governance system in Nepal, municipalities became more independent and autonomous and can impose tax, allocate budget, make their own policies and enforce them. From local bodies, they are promoted to local government. All cycles of DRRM responsibilities are now transferred to local governments, which only used to engage in the initial response phase in the past. This situation has opened, a plethora of opportunities to local municipalities for designing and implementing inclusive and resilient cities on their own.

However, resilience building of urban municipalities will not happen automatically, but only through a concerted transfer of suitable responsibilities and added authorities and power to deliver the same. In the given evolving context, following are the major bottlenecks, which need priority attention followed by localized version of appropriate interventions:

- a. urban institution and urban governance are not risk sensitive and disaster friendly.
- b. Inadequate knowledge and awareness, and poor compliance and enforcement.
- c. Weak and ordinary capacity of urban local government.
- d. Limited community engagement and collaboration with relevant partners and stakeholders.
- e. Absence of mainstreaming of DRRM into urban policy, planning and delivery process.
- f. Scarce effort to develop hazard Map and Risk Sensitive Land Use Plan. ■

Urban Resilience Agenda for Afghanistan

By Hiroshi Takabayashi, Programme Management Officer, Human Settlements, UN-Habitat, Afghanistan

Not only the prolonged conflict, but also recurrent small- and large-scale disasters have put Afghanistan in a vicious circle of underdevelopment. In the last ten years, there are over 24,000 deaths and 45,000 injured civilians by armed conflicts, whereas disasters caused more than 2,500 deaths, over 12 million affected and USD 168 million economic losses.

In addition, Afghanistan is experiencing a rapid urbanisation. The urban population, which is currently about 25% of all population, is expected to grow to 40% by 2050. The urban settlements in Afghanistan are characterised by a high density of population and high proportion of informal settlements (e.g. 70% in Kabul).

Urbanization is an opportunity for Afghanistan to realize sustainable development by turning urban into growth hubs, cultural centres, and social inclusion arenas. Therefore, the enhancement of urban resilience is a pressing issue in Afghanistan.

In this context, this article suggests two items as a part of the urban

resilience agenda for Afghanistan; integration of disaster risk reduction into the urban planning and enhancement of the basis of resilience of the urban population.

First, it is imperative to integrate disaster risk reduction into urban planning and its development agenda. It has been often the case that urban planning has been done without the appropriate disaster risk assessments, and infrastructures were built without considering disaster and climate risk such as flash floods and earthquakes. Afghanistan's development policy stresses upon the importance of improving infrastructure, human capital along with a good quality of service delivery for its development needs. Such investments need to be risk-informed and be made to enhance the resilience of cities.

Second, the investment is needed to enhance the basis of resilience of urban population. The UN-Habitat assessment under its Project for City Resilience in Afghanistan (2017 - 2019) has revealed that the resilient status of Afghanistan's urban

population is very weak. For instance, housing and public buildings such as schools and health service centres are vulnerable to earthquakes. Access to affordable and basic amenities such as water, sanitation, health service, electricity and transportation is very limited especially in urban informal settlements. Also, the level of school enrolment and literacy rate (especially for women) and employment rate were all uniformly low. Furthermore, it was found that social cohesion, which is an integral part of Afghan culture, was also deteriorating in urban areas. As observed in many other countries, social cohesion is an important part of community resilience and it is indispensable in restoring peace and development in Afghanistan. Unless these underlying vulnerabilities are properly addressed, urban resilience in Afghanistan would not become a reality. ■

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2. STRENGTHENING URBAN DISASTER RISK GOVERNANCE

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Mihir R. Bhatt, AIDMI, India

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2.9 Agenda for Urban Resilience in Asia: Key Actions

Colin Fernandes, Regional Preparedness Advisor, American Red Cross, Thailand

Making Cities Resilient

Supporting Cities in India Towards the Development of Local Disaster Risk Reduction Strategies

By Mihir R. Bhatt, All India Disaster Mitigation Institute

The UN Office for Disaster Risk Reduction (UNDRR) has been supporting city authorities for the implementation of the project "Making Cities Resilient and Sustainable: Implementing Sendai Framework for Disaster Risk Reduction 2015–2030 at local level". The focus is on building capacities and providing support to cities to conduct a self-assessment on disaster resilience using Disaster Resilience Scorecard for Cities and prepare the ground for the development of disaster risk reduction (DRR) action plans. In 2018, UNDRR had carried out such an assessment of 15 cities in India.

Based on the findings of the assessment, UNDRR has further extended its support to three city authorities – Rajkot Municipal Corporation, Bhuj Municipality and Anand Municipality – in the development of the DRR strategies and provide opportunities for city authorities to strengthen and understand the implications and coherence among the Sendai Framework, Paris Agreement and the 2030 Agenda for Sustainable Development, National Disaster Management Plan and Prime Minister's 10-point agenda on DRR. It also provides an opportunity to cities to understand the integration of disaster risk reduction in development processes and investments; understand the Making Cities Resilient Campaign; learn the process in developing DRR strategy and realign the City Disaster Management Plan with the Sendai Framework and National Disaster Management Plan of National Disaster Management Authority.

The implementation of the project is aligned with the methodologies guided by the UN Office for Disaster Risk Reduction (UNDRR) supporting the implementation of the Making Cities Resilient Campaign. The project contributes to the achievement of Target E of the Sendai Framework for Disaster Risk Reduction.

The project targets the city level DRR strategy to be aligned with the National Disaster Management Plan of Government of India, the Prime Minister's 10-point agenda on Disaster Risk Reduction, the City Development Plan of each city, the Sendai Framework, any existing plans or policies on climate change, and endorsed by the City authority to ensure its sustainability and adoption for implementation.

The proposed interventions under this project facilitates the cities to make systematic strategy and actions to deal with future hazards/disasters which will help to minimize the life loss as well as property loss. It will provide the cities clear vision and mission in terms of disaster risk reduction. It will also help the cities to make clear budgetary provisions. The core outcome of the proposed interventions will be – 1) improved understanding of the city officials on how to link DRR actions with their cities' development actions; and 2) cities will be able to show case examples of sustainable development.

The process being followed in three cities is fully participatory and inclusive. The key stakeholders such as City Mayor, Municipal Commissioner, Municipal

Councilors, head of key line departments, Standing Committee Chairman, Heads of various city level missions, local NGOs, CSR companies etc. have been consulted to understand the existing DRR mechanisms.

The project is being implemented in three cities- Rajkot, Bhuj and Anand. Based on the progress made so far, following are the key highlights:

- The cities need to understand the existing risks through conducting safety audits;
- The cities need to revise the existing Disaster Management Plan in terms of localizing and contextualizing the plans;
- The city authorities need to strive for not only a SMART n city but a Safe and Secure city;
- The city authorities want to design the inclusive awareness generation campaigns for the most vulnerable groups such as women, children, youths, street vendors, masons, etc.;
- The city authorities express the needs to design the implementation of existing Disaster Management Plans;
- The city authorities need to understand the process on mainstreaming DRR into development agenda.
- The city authorities emphasise to develop safety plans of schools, hospitals, government offices and other key buildings.

It is also important to understand the local context, culture, citizens and local examples to make people-centred DRR strategy. The strategy should be linked up with important investments by agencies such as ADB, World Bank, etc. ■

How Do Cities Learn?

By *Sanjaya Bhatia*, Head of Office Incheon, UN Office for Disaster Risk Reduction (UNDRR), Republic of Korea

Over 50% of the world's population is now living in cities. Rapid urbanization is overwhelming the capacity of cities to deliver goods and services. The result is deterioration in delivery of basic services including education, sanitation, water supply, land tenure and rights, and others. These factors undermine the resilience of the people, by aggravating underlying drivers of risk. The result is increased vulnerability of the people to disaster and climate risk.

Cities are endeavoring to reduce disaster and climate risks to improve the quality of life for their citizens, as well as to showcase the city as an ideal destination for investments. Several tools are available to support cities in this endeavor, one of them being the Making Cities Resilient Campaign, a global campaign since 2010, covering over 4300 cities. The Campaign has focused on the issue of learning by cities in several steps.

The first step is to breakdown the elements of disaster resilience into easy to handle and understand "10 Key Essentials". (see: <https://www.unisdr.org/campaign/resilientcities/toolkit/article/the-ten-essentials-for-making-cities-resilient>)

The second step is to provide cities a simple tool which can break down the scope of the Sendai Framework for Disaster Risk reduction 2015-2030, into indicators applicable to a city. An example is the Disaster Resilience Scorecard for Cities, available in two formats - Preliminary (with 47 indicators) and the Detailed (with 117 indicators). These indicators allow a city to walk through what the Sendai Framework is asking of them to enhance resilience, and by discussing the



indicators the cities can establish a baseline of resilience that they have achieved. This helps a city understand the pathway to achieve a higher level of resilience by 2030. Cities can use the results of the Scorecard assessment to develop a DRR strategy, to be integrated to the City Development Plan.

The third step for learning is for cities to utilize the accumulated knowledge available on reduction of disaster risks, either through the Campaign website: <https://www.unisdr.org/campaign/resilientcities/> or by using other sources such as PreventionWeb: <https://www.preventionweb.net/english/>

In addition, cities can learn from the disasters they experience, by analyzing the impacts, and investigating what worked and what did not, and why? This is the concept underpinning "Build Back Better" and is essential if cities are to learn from disasters and prevent future risks.

Cities learn through capacity development of their officials. This is achieved by accessing a plethora of training programs available on disaster resilience, both online and face to face. Listing of relevant courses can be found on PreventionWeb. The learning is also possible from the knowledge products available on such platforms, such as the Words Into Action guidance series: <https://www.preventionweb.net/sendai-framework/wordsofintoaction>

Rapid urbanization is overwhelming the capacity of cities to deliver goods and services. The result is deterioration in delivery of basic services including education, sanitation, water supply, land tenure and rights, and others.

Cities learn by engaging with multiple stakeholders, especially the civil society organizations and universities. Engaging with a broad range of stakeholders ensures validation and public audit of the assumptions on resilience made by the city officials, as well as allows the city to access technical skills and

knowledge, and different viewpoints and perspectives, to inform the resilience strategies making them more robust.

City to city learning through exchanges and peer reviews is a key means of learning. Such exchanges have successfully been organized as part of the Making Cities Resilient

Campaign. Specific tools include the UScore2 (<https://uscore2.eu/>). Yet much more needs to be done to scale up this key means of learning for cities. Apart from organizing experience sharing conference and platforms, development partners of cities, and the cities themselves, need to invest much more in exchanges, to learn by observation. Cities need to share data and experiences and make

most of this information available online to facilitate the process of sharing and learning.

Proactive action by cities to reject the status quo and to open up to learning and sharing is critical for increasing resilience to face the coming challenges. ■

VISION FOR URBAN RESILIENCE

Role of UN in Urban Resilience: A View

By Dr. K. R. Sastry and K. Venkateswara Rao, Social Experts Team, World Bank Project on DRR in Andhra Pradesh, India

Background: According to the International Federation of Red Cross Societies (IFRC, 2010), by the end of 2011, 468 cities in India had a population higher than 0.1 million with most being exposed to multiple hazards, specifically the earthquake, cyclone, storm surge, drought, flood and fires, which often occurred simultaneously.

Growing concentration of people and built-in economic assets in cities will be increasing the propensity to disaster risks. Access to services and resources is becoming increasingly contested, worsening people's vulnerability and capacities to cope. Indeed, Indian cities like Mumbai, Kolkata, New Delhi, Chennai, Bhubaneswar, Pune and Surat are some of the more vulnerable and high-risk cities in the world. Accordingly, this essay on "Role of UN in Urban Resilience" examines the theme under the framework of Sustainable Development Goals (SDGs) 2015; and, India is a signatory to the Agreement, and has taken appropriate measures for their execution. A brief explanation of key terms is in order here.

UN SDG 11: Make Cities Inclusive, Safe, Resilient and Sustainable. In September 2015, world leaders adopted the 17 Sustainable Development Goals (SDGs) as part of the 2030 development Agenda. Officially came into force on 1

January 2016, and expected to be achieved within 15 years, i.e., 2030. Although SDGs are not legally binding, governments are expected to take ownership and establish national frameworks for their success. Countries also have the primary responsibility for follow-up and review the progress based on quality, accessibility and timely data collection. National reviews will feed into regional reviews, which in turn, will inform a review at the global level.

Resilience: The Japanese say: "Resilience is like the Bamboo, which bends under the weight of winter snow, stands tall again come springtime. The snow covered bamboo represents the ability to spring back after experiencing adversity."

Urban Resilience: According to Rockefeller Foundation, "it is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience." Unplanned cities are more vulnerable to shock as they often have pre-existing stresses. In cities that are not prepared to recover shocks can intensify existing stresses or even create a cascade of negative impact that compromises urban functionality and put people at risk.

Drivers of Risk in the Urban Environment: Cities and urban areas represent dense and complex systems of interconnected services. As such, they face a growing number of issues that drive disaster risk. Strategies and policies can be developed to address each of these issues, as part of an overall vision to make cities of all sizes and profiles more resilient and livable. Among the most significant risk drivers are:

1. Growing urban populations and increased density, which put pressure on land and services, increasing settlements in coastal lowlands, along unstable slopes and in hazard-prone areas;
2. Concentration of resources and capacities at national level, with a lack of fiscal and human resources and capacities in local government, including unclear mandates for DRR and response;
3. Weak local governance and insufficient participation by local stakeholders in planning and urban management;
4. Inadequate water resource management, drainage systems and solid waste management, causing health emergencies, floods and landslides;
5. The decline of ecosystems, due to human induced activities like road construction, pollution, wetland reclamation and unsustainable resource extraction, that threatens the ability to provide essential

- services such as flood regulation and protection;
6. Decaying infrastructure and unsafe building stocks, which may lead to collapsed structures;
 7. Uncoordinated emergency services, which decreases the capacity for swift response and preparedness;
 8. Adverse effects of climate change that would probably increase or decrease extreme temperatures and precipitation, depending on localized conditions, with an impact on the frequency, intensity and location of floods and other climate-related disasters;
 9. Globally, the recorded number of hazard events that adversely affect human populations is on the rise; and
 10. Each local and urban context is affected differently, depending on the prevailing hazards in each location and the exposure and vulnerabilities.

INDNDR (1990-2000) Secretariat launched the RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters) initiative in 1996, promoting global activities for reduction of urban seismic risk, experienced rapid growth, especially in developing countries, by helping to raise public awareness on urban resilience.

Urban Risk and Planning: One of the DRR themes proposed by the International Strategy for Disaster Reduction (ISDR) is Urban Risk and Planning. This refers to measurement and management of urban hazards and vulnerability in line to improve awareness and local capacity to effectively reduce disaster risks.

UN-ISDR (2000-2005): Its Resilience Agenda highlights cities that become more resource efficient by being more flexible and better able to learn and respond to changed circumstances. Resilience building can simultaneously offer

opportunities to build resource efficiency to help cities become more flexible by reducing exposure to the risk of shortfalls in essential inputs which include: materials, products, water, energy, and food—essential for urban functioning. The outcome of achieving greater resource efficiency can contribute to a city becoming more resilient; to rely less heavily on systems that provide resources. Achieving resilience and resource efficiency at city-level can help meet broader sustainability and aim at addressing major challenges like climate change and pressure on natural resources. They are concerned not only with short-term successes but also providing key tools for the long-term sustainable development of cities.

Hyogo Framework for Action & Urban Disaster Resilience (2005-2015): We live in a world which continues to experience dramatic suffering and loss of life due to natural hazards. The disaster paradigm has accelerated efforts toward resilience building, particularly since the adoption of the Hyogo Framework for Action (HFA) a ten-year plan to build the resilience of nations and communities, urban areas to disasters present complexity and interconnectivity of various elements, and this needs to be considered when building the resilience of such areas to disasters. To address urban risks, local level disaster risk reduction (DRR) is of fundamental importance, not only because it is closer to the citizens, but it is the repository of regulatory governance functions and local knowledge, the need to scale up the capacity of DRR at the local government level to build urban resilience is a key incentive.

The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030: This has emerged as a systematic approach to reduce the impact of Disaster Risks and climate change on the built-in environment. Issues like unplanned urban development; vulnerable livelihoods; Ecosystems decline are yet to be fully addressed.

Consequently, the post-2015 United Nations (UN) disaster management and emergency policies have failed to capture the dynamics of hazards, exposure and vulnerability, essential for building urban resilience. Building coherence between the SDGs (2015-30), especially, Goal 11, for built-in environment and the SFDRR is the sine-qua-non. For the moment, SFDRR is already 5-years old globally, in the stipulated 15-year non-binding Agreement (2015-30) amongst the comity of nations. Nevertheless, it has recognized the State's primary role to reduce risk and that responsibility should also be shared with all stakeholders like Local Government, Private Sector, etc. Finally, SFDRR aims at realizing "substantial reduction of disaster risk and losses in lives, livelihoods, health, social, economic, physical, cultural and environmental assets of persons, businesses, communities and countries" by the year 2030.

A Critique of DRR: The Sendai Report (2012) on managing disaster risks for a resilient future argues: "The practice of Disaster Risk Reduction is a defining characteristic of all resilient societies, and should therefore be integrated-or-mainstreamed-into all aspects of development." However, not much headway has been made in this direction. Implementation of the SFDRR in conjunction with the SDGs and Paris Climate Agreement provide opportunities for addressing neglected but challenging tasks of disaster risk management in India. In a scathing report on Chennai Flooding, the Comptroller and Auditor General (CAG) of India, held the Tamil Nadu government responsible for the 2015-Chennai floods and called it a "man-made disaster," as it allowed encroachment of lakes and river floodplains, leading to massive destruction. Furthermore, almost annual flooding especially the building and wall collapses and in Mumbai (2019), landslides in the surroundings of Pune, have proved both rural and urban Maharashtra is highly prone to flood disaster, then any other State

in India. Other cities affected by floods include: Srinagar, Guwahati and Bhubaneswar. The recent stubble burning in the States of Punjab and Haryana (2019), has not only caused air pollution in the National Capital Region, Delhi, but also near darkness during the daylight, is a case in point that measures to prop up DRR remained a distant dream.

Conclusion: Perhaps, the only silver lining on the Urban Resilience horizon was the successful management of Urban Risk, came in the form of skillful management of *Hudhud* Cyclone (2014) in Andhra Pradesh. The storm surge had devastated the coastal city of Visakhapatnam, demonstrated the

value of early warnings; and, of prompt information dissemination. The timely forecast allowed the AP Government to take a slew of measures--large scale evacuation of people; pre-emptive stoppage of potentially hazardous services; closure of power supply, etc. Dr. Mohan Kanda, former Member of NDMA, in an article published in *Deccan Chronicle*: "What *Hudhud* Taught India" stressed that there was a lesson in this for other cities in the country.

The UNISDR's Global Platform for DRR held during 13 and 17 May 2019, at Geneva, Switzerland, concluded that modest progress has been made with reference to the post-2015 Developmental Agenda, since it is not binding on the

sovereign nations. As for National Strategies in the Asian region, thirty-six (36) countries have some type of DRR Guiding Document. While at it, regarding the alignment with SFDRR, 17 countries have either completed alignment with the Sendai framework or are in the process. It may be surmised that in India, being a signatory to the UN's SFDRR, in spite of some timely response by the National Disaster Management Authority (NDMA), not a very significant transformation has taken place on the ground. The recent 2018-Kerala Flood and the 2019 *Fani* Cyclone in Orissa, have established that there has only been a partial improvement; and, therefore it is still a long way to go for DRR to be put into practice in India. ■

PUBLIC AWARENESS FOR URBAN RESILIENCE

Communication and Outreach Needs for Urban Resilience

Experiences of Tata Centre for Development at UChicago

*Subhojit Goswami, Manager, Communications and Outreach,
TATA Centre for Development at UChicago, Delhi, India*

One of the 2030 Sustainable Development Goals is to "ensure responsive, inclusive, participatory and representative decision-making at all levels". If premonitions are to be heeded, we have time only till 2030 to prevent climate change from driving the world to the tipping point. This is why 'responsive', 'inclusive' and 'participatory' decision-making is important, wherein urban resilience can play a pivotal role. Today, cities consume 78% of the world's energy and produce more than 60% of greenhouse gas emissions¹. The global population living in urban areas is likely to increase from 55% to 68% by 2050. Projections show that 2.5 billion more people will live in urban areas by 2050, with about 90% of them in Asia and Africa².



Documenting how riverine communities interact with the Yamuna on a daily basis.

The first step to increasing resilience is to understand different layers of vulnerability within the urban spaces. This understanding,

however, won't develop if great ideas and solutions hide behind the facade of jargons, which keeps everyone else, except academia, out of the

¹ <https://www.un.org/en/climatechange/cities-pollution.shtml>

² <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>



Explaining the pollution situation in Yamuna through photos and individual testimonies.

decision-making process. We, at the Tata Centre for Development at UChicago, believe that citizens engage less with pressing issues if they have to learn a litany of phrases to understand them. That partly explains low uptake of academic research by government agencies and the struggle to feed research evidence into policy making.

As a research organisation, bridging this research-policy gap is the very premise of our existence. We owe a debt to the rest of the world to share research evidence as clearly and in an accessible way as possible. We do that by two ways: by not limiting our research findings to any protected or siloed space, and by reaching out to non-academic users and anyone who has a stake in it. Let me substantiate these claims.

One of our projects on tackling air pollution, Star Rating Program, has been designed as an information disclosure and transparency initiative that can facilitate citizen action in environmental monitoring. The program, which Maharashtra government refers as an "effective and affordable tool for air pollution abatement"³, for the first time, gives common people – the most important stakeholder – the access to information on emission from and performance of industrial units. This initiative has been adopted by

several other states. To communicate the benefits of this initiative and encourage people to stay informed about the industries in their vicinity, we reach out to students, civil society and advocacy organisations through workshops across states.

The same rationale holds true for our intervention on water pollution. Under Water-to-Cloud project, we democratise information on river water quality by making it available to common people. The objective is two-fold: understand temporal and spatial spread of water pollution with the help of real-time data and present the information in a visually

appealing way (mostly through heat maps) for non-technical users to identify pollution hotspots and compare trends in water quality in a stretch of a river that they are most concerned about. This way, both citizens and regulatory bodies get to monitor health of the rivers and assess efficacy of sanitation interventions.

We adopted a similar bottom-up approach to communication while sharing our findings on heat-induced mortality risk as part of a larger project – India Climate Prospectus. We localised and contextualised our Pan-India findings on temperature rise, number of extremely hot days and mortality numbers to suit the needs of each state where we presented our research.

These efforts at establishing communications interface between researchers and the rest stems from the belief that informed citizenry accepts responsibility. Hence, we try to go beyond providing empirical data, and arm people with actionable insights so that they are able to examine a situation, hold institutions accountable and shape urban resilience. ■



Involving youth and sensitising them about the impacts of air pollution.

³ <https://mpcb.info/about-program/>

Role of Leadership in Making Smart Cities Disaster Safe: A South Asia View

Dr. Stellina Jolly, Asst. Professor, Faculty of Legal Studies, South Asian University, New Delhi, India

South Asia has been witnessing an accelerated urbanisation resulting the growth of cities. In south Asia, cities are generating major share of the region's GDP and this exponential urbanisation has the potential to transform their economies to prosperity. However, cities which has historically represented the wheel of progress faces enormous challenges in terms of the essential public services, quality of life, environment and existence. A look at the major South Asian cities like Delhi, Lahore, Dhaka reveals the lack of essential services, water, waste and health crisis, and infrastructural setbacks. Uncoordinated and messy urban expansion has made these cities a boiling point for disasters resulting in loss of human and property. In this scenario policy makers in the region faces enormous challenges to bring in appropriate paradigm shift in improving the regions trajectory of development which will be instrumental in determining whether the United Nations' 2030 Agenda for Sustainable Development can be achieved. Smart City initiatives founded on technological prowess and flow of information are intended to overcome and ameliorate the limitations of such traditional urban management approaches in watertight uncoordinated silos.

However, although new technology can connect us and deliver data, cities won't become smarter without effective leadership. This is especially significant in the South Asian context where the question of exclusion and inclusion based on social and class stratification



dominates. For Instance, inadequate urban environments and disasters that make life difficult for everyone affect women more acutely. It is a common knowledge that women living in low-income South Asian urban contexts are disproportionately affected multiple safety hazards such as gender-based violence, unstable housing and inadequate sanitation facilities or lighting and this becomes acute in the time of disasters. In this scenario the question is whether the policies and planning for smart cities are planned to incorporate the needs of women or are they largely 'gender blind'?

While talking about the role of leadership, the emphasis is not just on the top down model but equally applies to bottom up approach. While technology may constitute the backbone of smart city functioning equally important is the accessibility and participation of communities in the initiatives. Thus planning for

smart city initiatives should not ignore the need to have broader community-based participation. Currently most of the planners, and policy makers are men and this essentially imply a system where male perspectives would dominate. This scenario needs to be changes with more of leadership role assigned to women and allow the natural perspective of women to flow in the planning and implementation process.

My hope is that community leadership natives can focus minds and galvanize support for best practice to be shared and sustainable urban development to be prioritized in Asia and the Pacific.

Some cities have started in Allahabad, customised women day night markets are being held with beat posts manned by women constables. Many cities have also introduced unisex bikes as part of the bike sharing initiative. ■

Agenda for Australian's Urban Resilience: Key Action

By *Leighton Morvell*, Director Capability and Outreach, Emergency Management Australia, Department of Home Affairs, Australia

While heatwaves, cyclones, floods, storms and bushfires are regular occurrences in Australia, unprecedented increases in intensity or frequency are expected with climate change. So-called rare events are occurring more often with greater impact.

The devastating fires Australia has experienced this summer show the challenge of managing extreme natural hazard events in a changing climate. While the extensive fires were burning throughout the landscape, many of our major cities and towns were shrouded in thick smoke haze. The smoke impacted peoples' health, and the economies of those cities where people could no longer participate in their regular activities

Our existing lifestyles and daily activities are heavily dependent on interconnected and interdependent systems to deliver essential services, such as energy, water, food, health

and education services, transport, and communications. The opportunity that globalisation and urbanisation provide to enhance our prosperity also make us increasingly vulnerable to essential service disruption.

Our growing and ageing population, and our increasing exposure and vulnerability to intensifying natural hazards, is in part leading to a higher likelihood and potential for loss and harm. The resulting cost to our society and economy from disasters is growing and becoming unsustainable. Disasters have cost the Australian economy on average more than AU\$18 billion per year for the past 10 years, and could reach an average of AU\$39 billion per year by 2050, without accounting for a changing climate. The broader social costs are estimated to be at least equivalent to the physical costs, if not greater (Deloitte Access Economics, 2015).

Reducing disaster risk is key to building our resilience, and must become business as usual. The Australian *National Disaster Risk Reduction Framework* (the Framework), was released in 2019 and sets the agenda for Australia to better understand our risks and vulnerabilities and to build a more resilient and prosperous society. The Australian Government is developing a National Action Plan, with Australian states and territories, communities and industry, to implement the Framework and find practical measures to reduce disaster risk.

The Framework focuses on decisions people make – government, industry, and communities – that can either reduce or create risk. Decisions about Australian infrastructure, services and planning, for example, make a difference to people's lives when a hazard occurs. ■

WWF Institutional Agenda for Urban Resilience

By *Tapas Das*, Coordinator- Communities Species & Landscape WWF India and *Deepjeet Datta*, India

India is facing a rapid urbanization rate which will lead to at least half of the country's population living in cities by 2030. A big threat to these cities will be the availability of water resources for their consumption. Therefore, one needs to check out the concept of urban water security which was introduced in Ministerial Declaration of the Second World Water Forum in The Hague in 2000. United Nations has defined Water Security as the "capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-

being and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability." The key pillars of urban water security are outlined as follows:

- Safe drinking water
- Protection of livelihoods and values
- Protection of ecosystems
- Water for socioeconomic development
- Treatment of wastewater
- Collaboration between users

- Coping with uncertainties
- Good governance

The challenges to water security will be many. For the sake of brevity, I will etch the challenges into a broad dichotomy of non-climatic challenges and climatic challenges. The non-climatic challenges will have drivers in terms of population growth leading to demographic changes, rapid rate of urbanization, growth of income rates leading to consumption, rise in energy demands and rise in demand for food consumption. The climatic changes will change the quality and

quantity of water available for consumption and exacerbate the socio economic risks of livelihoods options in cities. Therefore, a city to be truly resilient to water security needs to transition towards physical, technological, behavioral changes to effectively mitigate the water stress events to prevent them from becoming water shock events.

I would like to focus on equity to outlining how water resources can be effectively managed in an urban context.

Intergenerational equity – access to water resources for the current generations should not hinder the quality of life of future generations. Intergenerational equity-access to water resources among the current generation to be done through a participatory manner.

- Geographical equity - water resources are to be shared in a transboundary responsibility if needed.
- Procedural equity- regulations to be based on transparent processes so that everyone has

the right to access information related to water resources.

- Interspecies equity- humans must not degrade water resources beyond its regenerative capacity.

In the coming years, urban resilience programmes to manage the water stress need to be carried out in a sustainable manner with special focus on the equities mentioned above for proper resource management. ■

CITIES RESILIENT

Sustainable Resilient Cities (SRC)

By Mange Ram Adhana, President, Association for Promotion Sustainable Development (APSD), India

There is a deep connection between urban resilience and sustainable development. In fact, the ideal of sustainable development cannot be achieved without achieving meaningful urban resilience. It is well-known that resilient cities are better able to protect and enhance people's lives, secure development gains and foster an eco-system that drives positive change. On the other hand, unplanned cities, are more vulnerable to shock as they often have underlying risks which interact with acute stresses to precipitate extreme events.

Resilient cities are those that have the ability to absorb, recover and prepare for future shocks (economic, environmental social and institutional). Such cities promote sustainable development, Well-being and inclusive growth. Resilient cities have four pillars like economy, Environment, governance and society.

1. **Economy:** A large number of industries drive a dynamic economy to generate growth, conditions that allow innovation to take place, and people have access to employment.
2. **Society:** Society is inclusive, and cohesive, citizens networks in communities are active,

neighborhoods are safe and citizens enjoy healthy lives.

3. **Governance:** Clear leadership and management, strategic and integrated approaches, public sector has the right skills, and government is open and transparent and there is a participatory process.
4. **Environment:** Ecosystem is sound and diverse and infrastructure can meet basic needs, adequate natural resources are available and coherent policy towards land use.

Sustainable city: Also known as an Eco-city is one that is designed with consideration of environmental impact inhabited by people dedicated to minimization of required inputs of energy, water and food and waste output of heat, air pollution, co2, methane, and water pollution.

New pathways for sustainable and resilient cities:

- a. Integrate climate change adaptation with disaster risk reduction.
- b. Improve public space to create convivial safe and vibrant environments.

- c. Provide sufficient and adequate housing for all.
- d. Guarantee the social inclusion and integration of all sections of the society.
- e. Strengthen our local economies, and local employment opportunities.
- F. Create sustainable urban mobility patterns, and accessibility for all.
- G. Protect and enhance biodiversity and Ecosystem Services.
- H. Make resilience part of our local sustainability strategies and prepare for risk and impacts, taking into account the rights and needs of vulnerable sections of our society.
- I. Pursue a transparent data -driven and inclusive approach on resilience that will be enhance trust in our institutions and processes at all levels that support them.
- J. Apply nature -based solutions for multiple sustainable development outcomes using spatial planning blue and green infrastructure options promoting green zones and integrated coastal and mountain zone management to connect and engage with Nature in our urban world. ■

Agenda for Urban Resilience in Asia: Key Actions

By *Colin Fernandes, Regional Preparedness Advisor, American Red Cross, Thailand*



As a person who was born and raised in cities, I have a deep understanding and appreciation of how cities work and how to work with them. Cities provide us with an abundance of economic, cultural and social opportunities; they are also centers where creativity and innovation are nurtured and promoted. With the growth and expansion of cities – population, services and infrastructure, there is an increased stress on resources such water and energy and we have seen water crisis in Harare and Chennai (both in 2019) as examples.

It is now common knowledge that the rate of urbanization in Asia-Pacific is unprecedented. UN reports that currently half of the Asia and Pacific population are living in the

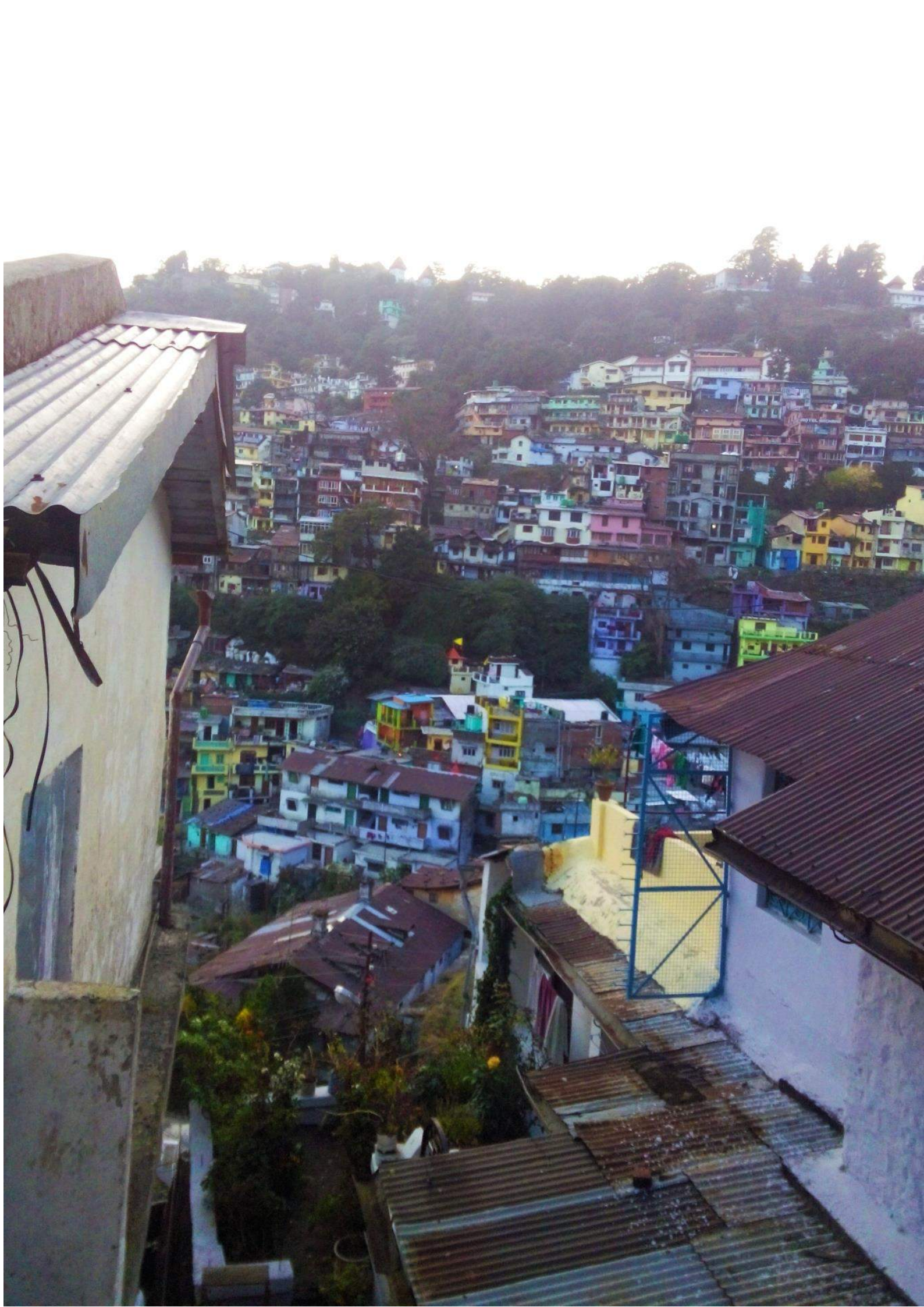
region's towns and cities while by 2050, urban areas will account for nearly two out of three people. Given this unprecedented growth, if this urbanization is not properly managed then it would put more people at risks both to disaster and climate change.

Cities consume high amounts of resources in a non-sustainable manner, it is therefore imperative that cities explore and switch to low carbon emission systems, invest in cutting-edge energy efficient technology/systems as well as an increase use of renewable energy. A key action would be to call upon city governments for these initiatives and ensure they are integrated into city policies, plans, and practices across all sectors.

Another key action is making cities more livable and with an improved quality of life – for example, in recent times, public awareness on the air quality has increased. The poorer the quality of ambient air, the greater negative impact it has on health and social life, not to mention the severity it will have on vulnerable groups such as children and older persons. It is necessary that city governance needs to go beyond economic growth and bring in quality-of-life indicators into urban planning that makes our cities more livable and healthier.

The Ulaan Baatar Declaration⁴ acknowledges the need to focus on underlying, interconnected and evolving disaster risk factors where rapid (and under-planned) urbanization alongside climate change being drivers for disaster risks. The Red Cross Red Crescent efforts on resilience building in cities, has seen that working in a coalition approach is extremely necessary to make our cities resilient to disasters and climate change as it brings together a range of stakeholders – government, civil society, academia, private sector and communities themselves to go beyond their administrative boundaries and work together to analyze risks from different perspectives and identify solutions where everyone has a role to play and contribute. With more people moving to and living in urban areas, it is essential that cities lead the way to a more environmental conscious and sustainable future. ■

⁴ Asian Ministerial Conference on Disaster Risk Reduction, Mongolia: 8th July 2018



3. INVESTING IN URBAN DRR FOR RESILIENCE

3.1 Making Cities Disaster Resilient

Mahendra Meena, Sr. Consultant (Earthquake & Tsunami), NDMA, Government of India

3.2 Agenda for South Asia: Making Smart Cities Disaster Safe

Dr. M. Mahfuzul Haque, South Asian Institute of Policy and Governance (SIPG), North South

3.3 Four Building Blocks for Financing City Needs to Meet Changing Climate

Chirag Gajjar, Head Subnational Climate Action, Climate Program, World Resources Institute (WRI), India

3.4 Addressing Displacement in Cities and Towns in Asia

Pablo Daniel Bernztein, Economist and Advisor at the Under Secretariat of International Insertion of the Ministry of Production and Employment of Argentina

3.5 Innovations in Urban Resilience

Kshitij Gupta, AIDMI, India

3.6 Urban Resilience Agenda for Afghanistan

Sameera Noori, Humanitarian & DRR Coordinator, Coordination of Afghan Relief (CoAR), Afghanistan

3.7 Mercy Corps' Approach to Building Inclusive Urban Resilience in Asia

Yoko Okura, Regional Program and Advocacy Manager, Zurich Flood Resilience, Mercy Corps, Indonesia

3.8 City Resilience in Vietnam

Do Ngoc Thao, Vietnam

3.9 An Urban Resilience Agenda for Asia Pacific SIDS

Dr. Tyrone C. Hall, Head of Communications, NDC Partnership, USA

3.10 Building Inclusive Resilience of Urban Solid Waste Management Systems

Charrrlotte Adelina and Jae Nikam, Research Associates, Urban Cluster, Stockholm Environment Institute (Asia), Bangkok

Making Cities Disaster Resilient

By Mahendra Meena, Sr. Consultant (Earthquake & Tsunami), NDMA, Government of India

India faces a large number of natural hazards such as earthquakes, floods, cyclones, landslides tsunamis etc. About 59 percent of area is vulnerable to moderate to major earthquakes, 12 percent of land area is vulnerable to flood and river erosion, two-third's of the area is vulnerable to drought, three fourth of total coast line is vulnerable to cyclones and tsunamis, and hilly areas are vulnerable to landslide and avalanches.

India has experienced exponential urban growth in the last few decades. The urban population of India has grown from 285 million in 2001 to 377 million in 2011 (Census, 2011) which is about 31 percent of the total population. The pattern of urbanization in India is characterized by continuous concentration of people in informal settlements and construction activities in haphazard manner which increase their exposure to various hazards such as floods, earthquakes, landslides and long-term stresses due to climate change. Unregulated and unplanned urbanization leads to higher vulnerability to natural hazards. The disaster risk can be high in the urban areas as most of the existing building stock is weak and also in the construction of new buildings, engineering codes and practices may not be strictly followed. The building regulation and enforcement becomes one of the important factors in guiding the development in regulated manner and ensuring the disaster resilient construction in the cities. Safety, serviceability, sustainability and resilience are the

key attributes cities should focus upon.

The core instrument of a building regulation is a building permit or license system to construct a building. It is usually granted by Urban Local Bodies (ULBs) alongwith concerned development authorities. Building permits usually allow ULBs or relevant local authorities to enforce a building code that has been adopted as part of a broader construction regulation. Building Permit system plays a crucial role in ensuring minimum standard of safety and stability of the structures. Therefore, robust building permits system should be in place incorporating the following, among others:

- Licensing of engineers to ensure accountability alongwith availability of adequate manpower
- Scrutinizing Structural Design Basis Report (SDBR)
- Site inspection at various construction stages
- Constitution of Tall Building Committee in case of tall building constructions

Since, a huge stock of existing buildings are already vulnerable to various disasters, therefore there is also need of holistic action plan by Urban Local Bodies, focusing upon i) regular structural safety audit of existing buildings, ii) selective retrofitting of priority structures in a phased manner, and iii) incentivizing home-owners to carry to undertake safety audit and retrofitting thereon, wherever needed.

How we communicate the risk to communities is also important, it is therefore imperative to generate awareness among masses with respect to the hazards and associated risk in a simple and easy to understand manner. It is pertinent to undertake measures which are intended to imbibe resilience amongst the communities by focusing on the short term/immediate measures which can be undertaken by the homeowners. Some of the common measures which can be undertaken by homeowners themselves include:

- In case of *existing building*: if there are visible cracks or distress in the building or unsure about the safety of the building then consult the structural engineer and retrofit it appropriately, if required. No alteration should be carried out in the building without permission and consultation if it has major implications on structural component i.e. beam, column or walls of the building.
- In case of *constructing new building*: consult structural engineer, preserve the design and layout drawings for future references, follow building codes and other sound practices for construction to minimize earthquake disaster. Avoid flood plain areas, filled up areas for construction as far as possible.

This will ensure that resilience is built in such communities thereby in the city as a whole. ■

Agenda for South Asia: Making Smart Cities Disaster Safe

By Dr. M. Mahfuzul Haque, South Asian Institute of Policy and Governance (SIPG), North South

Generally speaking, building disaster resilience is either misconstrued or remains in the hindsight of policy makers, implementers or law enforcers unless being reminded by disasters as a call to action. One of the major problems in attaining disaster resilience is the apathy on the part of actors in allocating time and resources to disaster preparedness during times of normalcy. In other words, actors only act when faced with disasters. Secondly, 'disaster resilience' can only be attained by efforts from individuals and members of the society. Resilience has to be from within. State can only provide inputs or create an enabling environment for attaining resilience. The other problem with building resilience is the 'risk perception' of people which may vary greatly on the basis of their education, living condition, economic situations and the like. Therefore, people living in coastal areas are highly exposed to natural hazards such as cyclones, and are likely to have low risk perceptions as they might have repeated exposure than those living in the cities. Likewise, people in high-rise buildings are more vulnerable to fire compared to people living in rural areas. Then the argument is, varying risk perceptions of people in the society produces different patterns of behavior which can act as a barrier to effective disaster resilience.

The key policy agenda for attaining disaster resilience should therefore begin with the question what are the perception of risks and how are they dealt with? What are the challenges towards effective disaster risk management? Is the Regulatory regime robust and effective in terms of its enforcement for disaster resilience? How countries in South Asia learn from others in building disaster resilience, and successfully implement the disaster action plans



FR Tower Fire incidence at Banani in Dhaka, Bangladesh on 28 March 2019.

for attaining disaster resilience? How the idea of building smart city fits to the current challenges for building disaster resilience?

The above questions can be tackled by revisiting the regulatory regime and by presenting two cases on enforcement of law in achieving disaster resilience in Bangladesh. Bangladesh has an area of 148000 km², Population over 160 million people and ranks 5th in the top 15 countries on earth with high risks, with Dhaka - the capital city of the country having a population density over 40000/ km². Serious challenges lie with air, water, and noise pollution, hazards from waste due to poor management, according to World Risk Report 2016. Bangladesh is ranked 5th in disaster risk among the world(UNU-EHS). Bangladesh has a robust disaster policy, law and regulation. The Disaster Management Act 2012, in section 2 has defined the terms and concepts on disaster. But the term 'disaster resilience' has not been defined by the Act. Rather the spirit of the term 'disaster resilience' have been implicitly meant or expressed through the terms under section 15 and 16 i.e. 'rehabilitation', and

'preparedness' respectively. The law has dealt with the institutional roles, formation of committees at different levels, and focused more on actions in the wake of natural disasters rather than specific provisions and roles for building resilience during non-disaster situations. The committee structure is likely to be successful in the event of disasters which are anticipated. But in abrupt disaster situations, the committee structures may work slowly in making prompt and effective response. The law does not specifically mention about disasters other than natural disasters. For non-compliance of instruction issued by relevant authorities willfully, section 37 would be enforced for breaching the law which would be punishable for 1 (one) year with imprisonment and fine of Tk100000 (one lac). The penal provision also appears to be very low to have a more effective outcome. On the other hand, as per section 45, none of the courts would take cognizance of the cases unless filed by Deputy Commissioner or any agent on his behalf. This provision of law appears to be slow in response and may completely jeopardizes the process by way of 'Tadbir' (an informal way of

influencing decisions) and from undue interferences from political corners.

Case-1: The case in point presented here, is the fire incidence of FR Tower in Banani, Dhaka which took place on 28th March 2019, killing 26 people while left 70 others injured.

"We have written to all the building owners on this street, including this one at least 5/6 times, asking them to take precautions for fire safety, but no one complied" – Fire Service Director.

According to the media report, the fire incident, at FR Tower in Banani, caused huge loss to life and property because of flouting the building code, faulty construction and lack of life saving equipments. There has been a huge loss and damage according to the assessment at Banani FR Tower fire incident owing to a number of faults such as non-compliance to building codes for construction, lack of emergency exits, absence of adequate smoke detectors, and fire extinguishers".

Case-2: Another case of man-made fire-hazard not being recognized as 'hazard' is mentioned below:

A sweet making factory has been built in the residential area of a town by a popular restaurant owner at Thakurgaon, North-Western region of Bangladesh. The owner of the factory promised to relocate it, and has been told once again to relocate the factory which emits huge smoke and pose as a constant risk of fire to the adjacent houses. The matter was notified to the local Deputy Commissioner who has been requested to enquire and take legal action. The Deputy Commissioner, Thakurgaon did not take any action despite several appeals and requests. Later the matter was informed to local municipality office, they made futile attempts but could not relocate the sweet making factory from residential area, the sweet factory owner made 'tadbir' to political higher-ups not to proceed with any investigation. Having no recourse, the matter has been referred to the Directorate of Environment at Rangpur, to prosecute under Environmental law. It was investigated but again the process was stalled by the interference of political higher-ups (own observation).

The above two cases stand as a testimony to the defiance of law in collusion with local administration, and provides an example how enforcement of law becomes problematic in developing countries

of South Asia. Therefore, even though fire hazards have been identified, but the law could not proceed further. In the first case, the Fire Department warned the building owners and all concerned, but their warnings were not heeded. Neither has there been any evidence that the Fire Department filed any cases against section 43 of the Disaster Management Act 2012. Even though there has been a law, but it was not enforced. The part of the problem was apathetic attitude of relevant actors towards public safety and disaster risks. Therefore, non-action by state actors and varying risk perceptions of citizens becomes a major bottle neck for disaster resilience. Disaster resilience can only grow strong, if citizens' are given the space and resources in a society. Resilience building is only possible through shared understanding and by increased stock of social capital of the country. Hence, authorities, instead of enacting new laws, should give more attention to enforcement of existing laws for greater safety and building greater disaster resilience in society. ■

CLIMATE RESILIENCE IN CITIES

Four Building Blocks for Financing City Needs to Meet Changing Climate

By Chirag Gajjar, Head Subnational Climate Action, Climate Program, World Resources Institute (WRI), India

The Urban Challenge:

Cities Climate Finance Leadership¹ estimates that 70% of global population will reside in urban areas by 2050. While, Cities also contribute significantly to global greenhouse gas emissions ~ 70%. With nearly, 90% of these cities are on coasts they also will be impacted by it the most. To address the challenge of climate change at city level, will require deriving specific solutions of a city. An integrated climate action

planning will help determine the hotspots of a city and its adaptive capacity specific to its emissions profile, availability of information and boundaries of a city.

Integrating Climate Change into Local planning:

Cities are at a crossroads to shift the way they function and operate. Cities will not only have to mitigate but also, adapt to the changing climate. To do so, cities must mainstream mitigation and adaptation in to local

planning and going beyond short-term policy making. There are four ways to prioritize and plan for financing cities to address the finance gaps.

1. **Bridging the Data gap:** collecting and providing data for various activities at a city level can help evaluate impacts and inform decision making. Availability of data can help public institutions adopt a time bound and realistic goals. It will enable public

¹ Alliance <https://www.citiesclimatefinance.org/>

institutions sending clear signals on low-carbon priority areas within a city boundary. These blogs, "Easing a Data Drought to Propel City Climate Action" and "Data-Driven Climate Action: Evidence-Based Policy for India's Regions"² provides several examples on how data can drive climate actions at city level.

2. Understanding Infrastructure Sensitivities: City infrastructures can broadly be categorized into *built infrastructure* and *future infrastructure* yet to be build. For built infrastructure the risk is due to increased exposure to the events due to changing climate. And future infrastructures will need to be resilient to events related to climate change. More importantly, it is important to identify sensitivities of infrastructures and understand infrastructure inter-dependencies. E.g. power utilities are critical infrastructure for city's operations. Its vulnerability could be compounded by the changing climate in extreme weather-related events resulting in failure

"Cities are where the climate battle will be won or lost".

- Patricia Espinosa, Executive Secretary of the U.N. Framework Convention on Climate Change (UNFCCC).

of a grid. Future planning must focus on weather related extreme event that could impact power generation being taken offline.

- 3. Assessing co-benefits:** Awareness about socio-economic and other positive benefits such as health, air-pollution of a climate action can help strengthen the case of financing among local, private and international funders. Valuation of co-benefits can increase the creditworthiness leading to increased potential for tapping into additional financing opportunities. Cities may need to set up mechanisms to measuring co-benefits and assessing impacts.
- 4. Financing strategy:** To develop a funding pipeline starts with developing pipeline of bankable projects. City climate action planning must outline a planned course of action for a city and then

to identify available sources of funding combined with strategy to bridge the gap in financing. Local governments can also tap into the policies and instruments that reduce the risk to attract private sector investment. E.g. UK's green finance strategy³ aims to deliver necessary investment for the overarching goal of net zero emissions by 2050 including avenues for investments at city level.

These building blocks aims to highlight and create positive externalities for scaling up finance at local level. These building blocks needs to be complemented with institutional arrangements that create favourable environment for investments into low-carbon actions within a city. The potential for financing climate actions comes from international climate finance channels, local financing and private financing. Cities must focus on prioritizing climate actions in an integrated manner to access and make best use of the resources available. ■



Source: <https://www.kisscc0.com/photo/finance-skyscraper-financial-statement-building-in-1r1qd1/>

² <https://www.wri-india.org/pt/blog/data-driven-climate-action-evidence-based-policy-india%E2%80%99s-regions>

³ <https://www.edie.net/news/11/UK-unveils-Green-Finance-Strategy-to-drive-progress-towards-net-zero-goal/>

Addressing Displacement in Cities and Towns in Asia

By Pablo Daniel Bernztein, Economist and Advisor at the Under Secretariat of International Insertion of the Ministry of Production and Employment of Argentina

Forced displacements, understood as people forced to flee from their usual place of residence to escape armed conflicts, situations of widespread violence, violations of human rights or natural or man-made disasters⁴, are an increasingly important problem and the number of these events is alarming. Although discrepancy exists in the estimates based on the source consulted, worldwide it exceeded 70 million people in 2018.⁵ According to the Global Report of Internal Displacement 2019⁶, there were 28 million internal displacements – displacements within the same state borders – in 148 territories in 2018. Of these internal displacements, 17.2 million were due to climatic and geophysical disasters and 10.8 million due to prolonged political crises, community violence and unresolved governance problems.

In the South Asian region in 2018, 3.8 million internal displacements occurred: 86% due to floods, storms and droughts and 14% due to unresolved conflicts and violence. To name a few examples from 2019, in Nepal, 31 people were left homeless due to a flash flood on September 21⁷. In Sri Lanka, 45.4 thousand people were evacuated due to flash floods between September 23 and 26.⁸ In Bangladesh, it is estimated that up to 244 people were displaced between October 1 and 5 because of river



Photo courtesy: Moni Basu, "Nepal, A Year After the Quake: 'Help Us!'", Cable News Network, last modified April 1, 2016, accessed October 1, 2016, [Photograph by Paula Bronstein](#).

floods.⁹ In Myanmar, in the south of Kutkai City, more than 400 people were displaced from four villages on September 24, after armed clashes between the Myanmar Army and the Ta'ang National Liberation Army.¹⁰

According to the Global Report of Internal Displacement 2019, internal displacement is becoming an increasingly prolonged and urban phenomenon, understood as "urban displacement" the forced movements from rural to urban areas, between urban areas and within the same urban areas. Faced with the need for individuals to move away from their homes, urban areas are usually perceived to have greater possibilities than rural areas for

improving livelihoods, with greater access to health, education, security, social mobility and more opportunities to generate income. However, in the Asian region these perceptions are not usually statistically confirmed: given the migration from the countryside to the city and the natural growth of the population, Asian urbanization rates are among the highest in the world and are not accompanied by greater economic growth or higher levels of human development¹¹. This causes cities such as Delhi, Mumbai and Calcutta in India, Dhaka in Bangladesh and Karachi in Pakistan to be among the most densely populated cities in the world and with a large proportion of the population living in informal

⁴ ONU, "Guiding Principles on Internal Displacement", 1998.

⁵ Alto Comisionado de las Naciones Unidas para los Refugiados (ACNUR), ACNUR: *Tendencias Globales de Desplazamiento Forzado en 2018*, June 2019, available at: <https://www.acnur.org/5d09c37c4.pdf>

⁶ Norwegian Refugee Council/Internal Displacement Monitoring Centre (NRC/IDMC), Global Report on Internal Displacement - 2019, May 2019, available at: <http://www.internal-displacement.org/globalreport/grid2019/>

⁷ <https://reliefweb.int/report/nepal/floods-triggered-heavy-rains-swept-away-two-children-and-properties> ⁵ <https://reliefweb.int/report/sri-lanka/sri-lanka-flash-floods-eu-delegation-sri-lanka-echo-partners-mediaflash-27>

⁸ https://reliefweb.int/sites/reliefweb.int/files/resources/20191006_Riverine-flood_NAWG-SituationUpdates_1.pdf

⁹ <https://reliefweb.int/report/sri-lanka/sri-lanka-flash-floods-eu-delegation-sri-lanka-echo-partners-media-flash-27>

¹⁰ European Civil Protection and Humanitarian Aid Operations (ECHO) - 27 September 2019

¹¹ Deb, "City Systems in South Asian Urbanization and Growth", Ponencia para la Conferencia IARIW-ICRIER: Experiences and Challenges in Measuring Income, Inequality and Poverty in South Asia", October 30, 2017.

settlements with inadequate infrastructure and services¹². Therefore, many times it leads to a deepening of poverty, disenfranchisement and secondary displacement due to disasters and evictions, mainly of the most vulnerable population.¹³

An example of this situation is the internal displacements of the Afghan capital of Kabul, where people fleeing to urban areas to escape the conflict between the USA and the Taliban government face challenges similar to those displaced by climate disasters. There are great difficulties in obtaining decent housing and security in the fulfillment of private property, which puts them at constant risk of secondary displacement, mainly in the form of evictions. Internally displaced persons in Kabul tend to be considerably concerned about their security and often live in marginal areas of the city with inadequate housing.¹⁴

Another reason for urban displacement is caused by development, mainly by infrastructure projects that do not take into account people's rights to

fair relocation and compensation. In India, for example, affordable housing plans promoted by the State, with the supposed objective of modernization of informal neighbourhoods and poverty reduction, in many cases contributed to the marginality and displacement of their original inhabitants. In the cities of Mumbai, Visakhapatnam and Raipur, infrastructure projects have been detrimental to certain groups evicted and displaced to the periphery, without being taken into consideration during the decision-making process.¹⁵ In other cases, the new housing of the evicted people do not adapt to their livelihoods and are far from shops and other urban services. Moreover, in addition to the physical loss and degradation they suffered, these people suffered negative mental health consequences.¹⁶

Naturally, since there are different causes of displacement, the policies to help the reintegration of the displaced differ. However, essential urban factors that influence the adaptation of internally displaced persons are employment and access to means of subsistence, housing and its property guarantee and the

access to basic services and infrastructure. The World Bank's experience indicates that when solutions to restore a certain normalcy in their lives and the possibility of self-sufficiency are offered to displaced people, they are better able to contribute to their host communities and also to return to their original homes when the situation improves there.¹⁷

While it is critical to develop policies that address forced displaced, it is also necessary to contemplate the impacts on the receiving territory: a massive displacement can affect access to goods and services, generate potential health problems, modify the structure of the labor market and the prices of the economy and even cause cultural changes.

As displacement is a global multicausal problem and has a wide array of consequences, both for the displaced and for the receiving territories, coordination between international organizations and local governments is necessary to address it in an effective, organized and comprehensive manner. ■

NEW DIMENSIONS OF URBAN RESILIENCE

Innovations in Urban Resilience

By Kshitij Gupta, AIDMI, India

Rapid urbanization has emerged as an undeniable global trend. Ever since 2008, more people in the world live in urban areas than in the countryside. In 2014 alone, 54% of the world's population resided in urban areas. This puts an extraordinary level of pressure on urban centres which account for only 2.8% of the world's land area. All these facts point to the distending of urban infrastructure and services

beyond their carrying capacity. This leaves these urban areas highly vulnerable to new risks. Fortunately, there are many organizations and agencies that have recognized the need to evolve innovative urban risk reduction initiatives to pursue the imperative of urban resilience. The following is a list of the same:

1. The Centre for Urban Disaster Risk Reduction and Resilience

Following the adoption of the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030, CUDRR+R was tasked by the UN Office for Disaster Risk Reduction (UNISDR) with updating the quintessential Making Cities Resilient Campaign Publication, How to Make Cities More Resilient: A Handbook for Local Government Leaders.

¹² Patel, "Upgrade, rehouse or resettle? An assessment of the Indian government's Basic Services for the Urban Poor (BSUP) programme", April 2013.

¹³ Ahsan et al., "Climate Migration and Urban Changes in Bangladesh", January 2016.

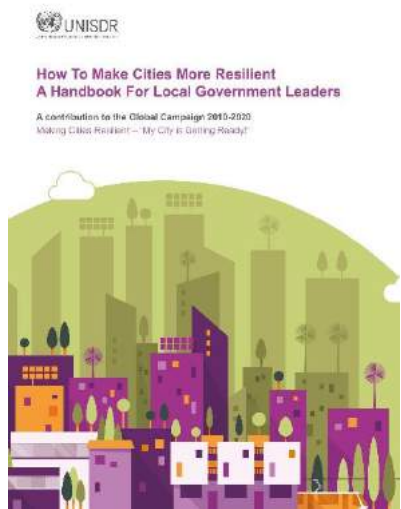
¹⁴ Abdoh, Hirsch-Holland, "Stuck in the Mud, Urban Displacement and Tenure Security in Kabul's Informal Settlements", 2019

¹⁵ Consult, in particular, the Principle 7: ONU, "Guiding Principles on Internal Displacement", 1998.

¹⁶ Gupte et al, "Forced evictions, demolitions and wellbeing in the city", 2019.

¹⁷ <https://www.bancomundial.org/es/topic/fragilityconflictviolence/brief/forced-displacement-a-growing-global-crisis-faqs>

The Handbook, written primarily for the local government leaders and policy makers, was developed over a year, presents how-to use the New Ten Essentials, showcasing examples of disaster risk reduction and resilience building practices from Campaign cities, and the Cycle of Resilience Building. The book was the successful result of partnership with Campaign Cities, technical experts and partner organizations and the UNISDR Urban Planning Advisory Group (UPAG).



The New Handbook for Local Government Leaders available for download at: <https://www.unisdr.org/campaign/resiliencities/>

2. The World Bank Group's City Resilience Program (CRP)

Established in June 2017, the World Bank Group's City Resilience Program (CRP) empowers cities to pursue investments which build greater resilience to climate and disaster risks, and to access the financing necessary to ensure that those investments come to fruition. The global need for urban infrastructure investment amounts to over \$4.5 trillion per year, of which an estimated premium of 9%-27% is required to make this infrastructure low-emissions and climate resilient.

The approach used by the CRP represents a fundamental shift in how cities can be supported to tackle their most pressing development

challenges - from one focused on sectoral priorities to one focused on integrated and spatially informed priorities, which capture the interplay between the natural and built environment. To date, this program has engaged more than 90 cities around the world on developing investment programs that could be financed with a range of financial instruments.

For more information, log onto: <https://www.worldbank.org/en/topic/disaster-risk-management/brief/city-resilience-program>

3. Urban Resilience Hub by UN Habitat

UN-Habitat is working to advocate for urban resilience at the global level and provide the knowledge, tools and solutions to make cities safer and move towards sustainable urban development.

Through our work on resilience, UN-Habitat has an extensive network of partner organizations, institutions, think-tanks, universities and governments. By hosting the Urban Resilience Hub, UN-Habitat is providing a space for knowledge, best practice and innovation to flourish.

The Hub relies on the valuable contribution from partner cities, academia, governments, international organizations and resilience champions from across the globe.

For more information, log onto: <http://urbanresiliencehub.org/about-the-hub/>

4. UN Office for Disaster Risk Reduction (UNDRR)

The United Nations Office for Disaster Risk Reduction (UNDRR) and its partners are working towards sustainable urbanization by taking proactive actions. The Making Cities Resilient Campaign (MCRC) - launched in May, 2010 - addresses issues of local governance and urban risk. The Campaign is led by the UNDRR but is self-motivating, partnership and city-driven with an aim to raise the profile of resilience

and disaster risk reduction among local governments and urban communities worldwide.

For more information, <https://www.unisdr.org/campaign/resiliencities/>

5. GIZ - Global Initiative on Disaster Risk Management II

Approximately 200 million people are annually affected by extreme natural events such as earthquakes, severe storms, prolonged droughts or heavy flooding. More and more people, infrastructure and assets are located in densely populated areas and in increasingly vulnerable regions. With the rapid growth of urban areas and economic zones, however, disaster risks are barely considered.



Disaster risk management (DRM) is at the heart of the international framework for disaster risk reduction established by the United Nations (UN Sendai Framework). It is also reflected as a cross-sectoral issue in the Paris Agreement on Climate Change and is further recognised by all major international agendas such as the 2030 Agenda and the New Urban Agenda. Implementing DRM is therefore a globally accepted requirement for all nations.

For more information, <https://www.giz.de/en/worldwide/69741.html>

6. ESRC-DFID research for policy and practice: urban community resilience

Cities have the potential to be great drivers of improvements in human wellbeing. And yet, poverty is an unrelenting feature of urban life. Addressing urban poverty and inequality is as much an infrastructure challenge as it is a challenge requiring political and social transformation. This collection of ESRC-DFID-funded research

interrogates what makes cities inclusive, safe, resilient and sustainable in times when migration and urbanisation processes are intensifying globally.

The studies from Bangladesh, Cape Verde, Nepal, Nigeria, South Sudan, and Timor-Leste articulate that the everyday lived realities of the most marginalised or least resourced urban residents matter, and are

relevant to different scales of development and governance from hyper-local issues to global advocacy around urban sustainability through the New Urban Agenda, the Sustainable Development Goals and the Intergovernmental Panel on Climate Change (IPCC).

<https://www.theimpactinitiative.net/resources/esrc-dfid-research-policy-and-practice-urban-community-resilience> ■

URBAN RESILIENCE AGENDA

Urban Resilience Agenda for Afghanistan

By Sameera Noori, Humanitarian & DRR Coordinator, Coordination of Afghan Relief (CoAR), Afghanistan



Urban National Priority Programme (U-NPP) 2016-2025 has highlighted that Afghanistan's on-going urbanization is rapidly transforming the country's demographic, social, cultural, and economic spheres, and presents an immense opportunity for propelling the country towards growth, prosperity and peace-building.

The country's urban transition has already commenced with a third of its population residing in urban areas, and by 2060, one in two Afghans will live in cities. This urban transition is occurring alongside significant quality-of-life, economic, and territorial changes which must be adeptly steered for leveraging the benefits of urbanization and minimizing negative externalities. While there are Major Challenges and Policy Reforms, absence of adequate and effective urban

planning, legislative and regulatory tools, Afghan cities have taken the form of unplanned low-density urban sprawl. The most evident pitfall of rapid urbanization has been unplanned urban growth manifested in informal settlements, which account for around 70 percent of the built-up areas in the cities. It is estimated that one-third of urban population resides in overcrowded dwellings, which when combined with the staggering amount of informal housing demonstrates the urgency to address this critical housing deficit.

The most adverse impacts of urban sprawl currently confronting cities is provision of public transportation, urban services and amenities which become cost prohibitive in low-density urban settings. Another important characteristic of Afghan

urbanization that must be not be overlooked is the regional imbalance in development. Specifically, the east, west-central and north-east have consistently lagged behind across all basic services, including health and education. As well, the spatial structure of Afghan cities is unbalanced, with Kabul city a clear 'primate city' accounting for 40% of the total urban population, therefore the grand vision of urban development in the next ten or 20 years must be bold, but also realistic as far as feasible achievements in the medium to long run are concerned. The Vision Statement from the U-NPP speaks for itself even if less than half of what is described may be achieved in the coming ten years: "By 2024, Afghanistan has a network of dynamic, safe, livable urban centers that are hubs of economic growth and arenas of culture and social inclusion through decentralized urban planning and participatory urban governance." as the conditions in Afghanistan's cities are difficult and far from satisfactory.

UN Habitat's short but topical Discussion Papers (both the "blue" and the "green" series, 2014-15 and 2016, respectively) show what has gone wrong, and what the government might be able to do, which obviously would require massive international support. (Ref-U-NPP 2016-2020) & (ANPDF 2017-2021 report). ■

URBAN RESILIENCE

Mercy Corps' Approach to Building Inclusive Urban Resilience in Asia

By *Yoko Okura*, Regional Program and Advocacy Manager, Zurich Flood Resilience, Mercy Corps, Indonesia

In Asia, the world's most rapidly urbanizing region, 64 percent of the population will live in cities by 2050. [Mercy Corps'](#) program interventions aim to mitigate the short and long-term effects of urban shocks and stresses on vulnerable communities, as well as creating an enabling environment for inclusive urban growth. Climate change poses special concerns for these rapidly growing cities, where large populations, accelerating urbanization, extensive poverty, and social marginalization—as well as an already high level of exposure to climatic extremes—create risks for large numbers of people. While our programs have a primary impact on the socio-economic well-being of vulnerable urban communities, achieving this goal requires a [systems level approach](#) – requiring us to working within and across complex, interconnected socio-political, ecological, and economic systems.

Our [interventions](#) focus on three main areas:

1. Inclusive, accountable decision-making in urban governance and service delivery

Mercy Corps works with cities to develop resilience [strategies](#) and test concrete risk-reducing interventions. This process is implemented through a [multi-stakeholder, governance approach](#) focused on developing solutions to existing, immediate and future risks in urban areas, while addressing some of the root causes of vulnerability. We work with local governments, private



Location of the photo is Semarang, Indonesia. Photo Credit: Mercy Corps.

actors and civil society groups to build social capital and systems for informed, transparent planning and service delivery.

2. Climate-smart ecosystem management and practice

Urban populations fundamentally rely on ecosystems for clean water and air, and a livable climate. Businesses and their consumers rely on the natural environment for food production, raw material, and inputs into manufactured commodities. Mercy Corps [engages](#) across stakeholders to decrease the impact of hazards in urban landscapes, while restoring functions of ecosystems to provide services for marginalized populations. Our teams facilitate transboundary cooperation, and support emerging institutions that foster critical transboundary market and ecological [solutions](#).

3. Enhanced knowledge of and access to risk information, including Disaster Risk and weather and Climate Information

Building resilience requires people and institutions to adjust to an environment of unpredictability to mitigate risk. Resilience planning, decision-making, and investment must be agile and anticipatory, and be based in accessible, timely information flow. Our [urban resilience programs](#) work on knowledge and information systems that support decision-making for vulnerable citizens, government, and the private sector, to tackle both rapid and slow-onset urban shocks and stresses. Mercy Corps also supports knowledge and learning platforms that connect urban resilience practitioners through networks and information exchange systems for continued learning. ■

City Resilience in Vietnam

By Do Ngoc Thao, Vietnam

The projected hazards and Vietnam's vulnerability to climate change demonstrate its need to build resilience with urgency. Sea-level rise, stronger cyclones, and storm surges will continue to be significant contributors to flooding and saltwater intrusion for the Mekong Delta, the River Delta, and the Central Coast. By breaking urban resilience down into four components, infrastructural, institutional, economic and social, this article provides examples of progressive steps that the Government, NGOs, private sectors, and community in Vietnam have been taken to address these challenges.

Firstly, regarding infrastructure, buildings, shelters, health care facilities, transportation have been improved and reinforced. Viet Nam is known to have perennial food events and damaged not only crops but housing and livestock. Amphibious systems have been designed to replace traditional house built on stilts. The system, which consists of buoyancy blocks underneath – provide flotation, vertical guideposts – keep house stable, and a structural frame – tie things together, enables the homes to

float even in the extreme floods. The ideas are being tested in the Netherlands, UK, and Bangladesh.

Secondly, on the institutional resilience, the Government of Vietnam have issued the National Action Plan on Climate Change (2012-2020) to strengthen monitoring and early warning system as well as improve the country's response to extreme weather events. Under Resolution 33/2013/QH13, the national government must prepare a National Strategy on Natural Disaster Prevention and Control every 10 years and account for climate-related impacts on socioeconomic activities. Can Tho and Da Nang are executing strategies to boost adaptive capacity amid rapid industrialization as part of 100 Resilient Cities.

Thirdly, economic resilience does not only refer to the community's ability to recover and function after a disaster but also the active participation and joint efforts of the private sector. For example, the Ho Chi Minh Stock Exchange requires listed companies to publicize their sustainable development report and climate action become required disclosure. Vietnam's Central

Highland is known for its high-quality coffee production. However, changes in the weather patterns (long-last wet days and dry seasons) have been affecting the harvests. The ECOM company has partnered with Sustainable Trade Initiative to administer soil management and water conservation trainings for the farmers, thus, able to maintain both coffee's quality and quantity.

Fourthly, social resilience refers to the social capital and ability of citizens, regardless sex, age, ethnicity, disability, socio-economic status, or other groupings, in adapting in a changed environment. Indigenous knowledge of the local people has been found useful in agricultural production. People base on the night/day sky observations or animal behaviors to make predictions on the rain. Some were transformed into folklore to make it memorable, for example, "Dragon flying low means rain, flying high means sun, flying in the middle means shady", "Winged ants appear, rains take place after." There is a need to specifically recorded and stored the community wisdom to combine with scientific knowledge to make its full usage. ■

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The floating house model. Photo Credit: Elizabeth English.

An Urban Resilience Agenda for Asia Pacific SIDS

By Dr. Tyrone C. Hall, Head of Communications, NDC Partnership, USA

The Paris Agreement process requires all countries to submit new and updated national climate plans this year. The plans will demonstrate collective commitment to building resilience and averting the critical 1.5-degree warming threshold. The Marshall Islands, the first country in the world to submit its commitments, is ambitiously pursuing an economy-wide low emission development pathway. This is leadership to be emulated by all, especially small island developing states (SIDS) that have been relatively timid about embracing economy-wide strategies due to cost and capacity limitations. The Marshall Islands plan is especially important for clarifying a framework to address a peculiar systemic challenge facing SIDS in the Asia Pacific: rapid urbanization alongside disproportionate climate risk. It paves the way for an urgently needed urban resilience agenda for Asia Pacific SIDS.

An Asia Pacific Urban Resilience Programme for SIDS tailored to local peculiarities is necessary. The region is urbanizing at the fastest rate in the world. The economic benefits urbanization portends for the region's mega mainland cities command headlines and policy agendas. However, rapid urbanization alongside compelling and disproportionate exposure to climate impacts are profound and distinct threats to the development gains and prospects of Asia Pacific SIDS. SIDS are effectively coastal entities with greater infrastructural and population exposure to current and projected climate impacts, including sea level rise and erosion. This heightened exposure demands an urban resilience programme of action that prioritises energy, waste, infrastructure, and the related

challenges in agriculture and water sectors to address inevitable food security issues.

Energy must be at the core of the Asia Pacific urban resilience agenda because the climate crisis is primarily a fossil fuel induced challenge that demands comprehensive transition to renewable energy sources. All Asia Pacific SIDS, except Papua New Guinea, are entirely dependent on fossil fuel imports, which means expending a great share of critical hard currency on fossil fuel imports at the expense of investment in critical infrastructure such as hospitals, schools and overall resilience building. During the turbulent period 2000 to 2007 when oil prices tripled, fossil fuel imports cost Fiji as much as [a fifth of Gross Domestic Product](#). Transitioning to renewable energy sources is a double opportunity for Asia Pacific SIDS. Chiefly, it directly tackles the climate crisis by reducing carbon emissions while boosting urban resilience in contexts where demand is trending upwards because of urbanization and industrial expansion. But it also opens up economic opportunities through job creation, re-allocation of state savings into new services and infrastructure, which will in turn respond to growing demand for jobs and infrastructure alongside rapid urbanization. This means Asia Pacific SIDS must articulate bolder plans to increase the use of renewables (solar, wind, geothermal, etc.), particularly in the provision of electricity. The optimization of energy efficiency should therefore become a complementary guiding principle.

Rapid urbanization in Asia Pacific SIDS means the often overlooked issue of waste management is now a

top priority in urban resilience building. There is a need for more studies, projects and actions to support the implementation of waste-to-energy initiatives, including from landfills. The region's SIDS should robustly reduce solid waste and methane emissions. Achieving these goals requires strengthening oversight in the waste sector. The likelihood that rapid urbanization in these small states that are disproportionately exposed to climate risks means waste management should command attention on par with infrastructure in the climate and urban resilience agenda. The latter is chiefly concerned with mitigating issues of drought, flooding, cyclones, and other extreme weather events, early warning systems, improved building codes and other national priorities -- all of which require continued monitoring, expansion and improvement.

With only a decade left to safeguard the sustainable development of the most vulnerable from the most dangerous impacts of climate change, 2020 is a period of reckoning for SIDS and for the world. Building resilience to climate change in small, rapidly urbanizing and disproportionately climate exposed Asia Pacific states warrants strong and special support for low emission development pathways that will provide a firm basis for continued growth and sustainable development. Asia Pacific SIDS will need special support spanning concessionary finance, technology transfer and co-development, and complementary capacity support to bring about systemic transitions that are reflective of their peculiar urban resilience challenges. ■

Building Inclusive Resilience of Urban Solid Waste Management Systems

By *Charrlotte Adelina and Jae Nikam*, Research Associates, Urban Cluster, Stockholm Environment Institute (Asia), Bangkok

The solid waste management (SWM) sector is often overlooked when understanding urban resilience. Regulating this sector is important - not only for improved environmental quality and healthy living, but also for improving inclusivity outcomes. We highlight key pressures and identify ways forward for strengthening the resilience of urban SWM systems.

First, poorly regulated waste flows aggravate disaster risks and public health concerns. Improperly disposed waste can choke the water ways, leading to aggravation of floods. Six people died due to a recent flash flood caused by plastic waste that blocked drains during heavy rains in Pune¹⁸. Unsegregated metal and chemical waste can lead to hazardous fires that produce hazardous smoke and may be difficult to extinguish. Recurring fires in Deonar dumping grounds in Mumbai led to increased air pollution in the surrounding area¹⁹. In Kolkata, open dumping of municipal waste led to health problems in residents near the dumping ground like common cough and cold, frequent diarrhea, infections and malaria²⁰. Ill-managed contaminated fecal matter can lead to disease outbreak in people residing near the exposed waste.

Secondly, the health risks faced by waste workers need to be addressed. Informal waste workers lead the way in building a circular economy by waste sorting and segregation in South and Southeast Asian cities, yet



Waste dumped in a drainage canal in Manila. Photograph taken by Dr. Diane Archer, Research Fellow, Stockholm Environment Institute.

they face threats to their health due to inadequate provision of protective equipment leading to exposure to toxic wastes. Within the sector, women are disproportionately affected when dealing with waste²¹. For instance, women workers producing and handling plastic face high risk of breast cancer and reproductive disorders.

Linking these two concerns, we argue that it is important to realize the compounded vulnerabilities of waste pickers and intersections of multiple forms of poverty that translates to a less resilient SWM system. The low value of land near toxic dumpsites and landfills often mean that the urban poor live in close quarters. In Bangalore, for example, vulnerabilities of a waste-picking community are compounded by (a) occupational health risks, (b) health risks posed by

the lack of infrastructure (water and sanitation) and (c) climate risks posed by urban flooding and heat island effects²².

We identify two actions for governments based on these concerns. Municipalities need be backed by central governments for adequate funding for the SWM sector and strict implementation of waste disposal regulations. In Bangkok city, the informal sector saves the local government nearly 500 million baht per year in waste management²³. It is time for local governments to acknowledge their contributions and compensate the workers with adequate protection equipment, social security benefits, and facilitating access to basic needs, to ensure their resilience to future shocks and stresses as well as their everyday exposure to hazards. ■

¹⁸ <https://www.indiatoday.in/india/story/pune-rain-flash-floods-cause-damage-casualty-all-you-need-to-know-1604054-2019-09-28>

¹⁹ <https://earthobservatory.nasa.gov/images/87429/fire-burns-in-mumbai-landfill>

²⁰ <https://www.sciencedirect.com/science/article/pii/S1878029616301700>

²¹ https://www.sea-circular.org/wp-content/uploads/2019/11/SEI_SEA-circular-1.pdf

²² <https://www.tandfonline.com/doi/full/10.1080/17565529.2018.1531745>

²³ https://www.unescap.org/sites/default/files/Closing%20The%20Loop_Sai%20Mai%20District%2C%20Bangkok%20Case%20Study.pdf



4. ENHANCING URBAN DISASTER PREPAREDNESS

4.1 Women Lead Urban Resilience

Dr. F.X. Lovelina Little Flower, Professor and Head, and Renaldo S Rajkumar, PhD Scholar; Department of Social Work, Bharathiar University, Coimbatore, Tamil Nadu, India

4.2 Making Mumbai Resilient: Action Agenda for Versova Koliwada, Mumbai

Jai and Ketaki Bhadgaonkar, Urbanists, Bombay61, Mumbai, India

4.3 Making Small Towns and Settlements in Sundarbans Delta Resilient: Role of Caritas Bangladesh

Ranjon Francis Rozario, Director (Programs), Caritas Bangladesh and Sanjib Kumar Mondal, Senior Program Officer, Caritas Bangladesh

4.4 Key Actions for Better, Stronger, and Safer Cities

Lamia Kamal-Chaoui, Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD, France

4.5 Making Animals in Smart Cities Disaster Safe: A View

KM Singh, Former Member, NDMA, India

4.6 Towards Renewed and Resilient 'Green Cities': A Commitment

Dr. Aroind Kumar, President, India Water Foundation, New Delhi, India

4.7 Energy and Employment in Ahmedabad: A View

Reema Nanavaty, General Secretary, Self Employed Women's Association (SEWA), India

4.8 Smart Cities Planning in India: Where do Marginalized Women Stand?

Dr. Annapurna Devi Pandey, Anthropology, University of California, Santa Cruz (UCSC), California

4.9 Need for Urban Irrigation for Cities in India: Making Cities Resilient

Dr. I Satya Narayana Raju, MTech, MBA, MPhil, BL, FIE, PhD, Former CE, Hyderabad, India

Women Lead Urban Resilience

By *Dr. F.X. Lovelina Little Flower, Professor and Head, and Renaldo S Rajkumar, PhD Scholar; Department of Social Work, Bharathiar University, Coimbatore, Tamil Nadu, India*

Urban resilience is universally acknowledged as the key underlying factor for achieving the Sustainable Development Goals (SDGs). Urban economy growth accounts for more than 80 percentage of the Global GDP (World Bank 2014). Urban resilience needs to be understood through the prism of systems thinking because it is interconnected by various components like people, infrastructure, institutions, societal norms, economy and eco-system and if any one of these is affected it will have implications on the whole as the urban system is a collection of complex networks and elements (Global Alliance for Urban Cities, 2019).

Gender inequality and Social exclusion are the predominant factors which undermines the capacity of communities and people to experience, cope and recover from

disaster risk and climate events. It is inferred that six out of ten of the world's poorest people are still women and represent only sixteen percent of world's parliamentarians and two third of female children are not exposed to school. However, progressive socio-economic, political and cultural changes in human society have helped women to participate more actively in the processes of industrialization, modernization and globalization. Empowering women and increasing their participation in such processes can be achieved by improving their access to knowledge, education, information, financial autonomy. This in turn, will increase their stake in the decision making and political power structure to combat entrenched gender inequality.

A combination of the above factors establishes a trend of women striving

for greater rights and opportunities to emerge as great changemakers and leaders in urban affairs. A Knowledge, Attitude and Practice (KAP) survey reveals that 98% of the respondent felt that women had an active role in Disaster Risk Reduction (DRR) and displayed potential towards leading urban resilience (SPRING, 2011). Providing training and enhancing the capacity of women exposed to disaster risks brings a novel and innovative feminine perspective to risk reduction. In the aftermath of the Fukushima disaster in 2011, the people of East Japan overcame the crisis by creating numerous small networks to build social capital towards the evolution of strong disaster resilient communities (UNISDR, 2015). Empowerment of urban women for active participation in Disaster Risk Reduction (DRR) improves policy making, decision



Saalumarada Thimmakka, receiving Padma Shri from the President of India. Image Credit: The News Minute



Krishanammal Jagammathan receiving Right to Livelihood Award. Image Credit: friendsofafti.blogspot.com

making, and implementation process in urban areas leading to a paradigm shift to engender Gender Equality and Women's Leadership. (UNISDR, 2015).

Saalumarada Thimmakka (80), an environmentalist from Karnataka, India has planted more than 8000 trees in a span of 80 years. She has been resilient to the local government towards deforestation. Krishanammal Jagammathan (92), a Social activist and freedom fighter from Madurai, Tamil Nadu has initiated Land Reform Movement for the *Dalits* and has lead a mass

"Woman has been suppressed under custom and law for which man was responsible and in the shaping of which she had no hand. Woman has as much right to shape her own destiny as man has to shape his. It is up to men to see that they enable them to realize their full status and play their part as equal of men"
- Mahatma Gandhi

campaign for protecting the coastal ecosystem. She is instrumental in establishing many organizations for the poor that benefit 11,000 poor,

landless women and *Dalits*. Her resilience is a model of empowerment for the women to fight for human rights.

The gendered stereotypes about women in urban areas, lower their chances and opportunities by creating barriers to their meaningful participation in the developmental context. Today urban women are more actively participating in urban affairs to emerge as leaders and change makers to usher in sustainable urban resilience and development. ■

ADAPTATION AT LOCAL LEVEL

Making Mumbai Resilient: Action Agenda for Versova Koliwada, Mumbai

By *Jai and Ketaki Bhadgaonkar, Urbanists, Bombay61, Mumbai, India*

Climate change has serious impacts on the cities and specifically on the indigenous coastal communities around the world. As of today, Mumbai's coastline is dotted by 38 such fishermen settlements (Koliwada) that date back to 400 years of evolution. Versova Koliwada is one of the most thriving fishing villages in the city of Mumbai. However, climate change, developmental pressures, ecological deterioration and changing aspirations have led to uncertainties in fishing as a livelihood. In recent years, most of the *Kolis* have had to sell their boats due to the economic losses.

The project initiated by Bombay 61 creates an opportunity to establish close interactions with the

community, to understand their concerns and initiate trans-disciplinary dialogue to coproduce transformative actions that envision sustainable development. By recognizing the skills and knowledge of the *Koli* community, the Bombay 61 team foresees an opportunity to collectively bring a change for improving local conditions.

Due to the nature of the water currents, the solid waste eventually settles on the sandy beaches of Koliwada. During monsoons, mountainous heaps of plastic debris accumulates on the coast. The consequences of this extreme pollution have brought about an increase in fish mortality, which negatively impacts the livelihood of the local fishermen. These actions affect the local economy, allied

skilled occupations and fuels ecological concerns.

The proposed intervention encompasses a number of critical questions and tackles two major issues: integration and sustainable development. The intervention intends to blur the existing social boundary between the *Kolis* and the city dwellers, and effectuate integration across various levels: social, economic, spatial and political. This proposal wishes to address the issue of an 'uncertain future' of these communities by building resilience and exploring different methods that can sustain their existence and propel it forward in an exemplary environment-friendly manner.



The idea is to facilitate new activities and services is based on the principle of micro-intervention. One of the major pollutants responsible for the coastal and mangrove degradation is plastic debris. The first step of the initiative designates focal points for waste collection and segregation. The intention is to use the skills of the net weavers to make filter screens, suspended 2 meters deep in the creek and anchored along the edge, imitating a water filter system. This ensures uninterrupted movement of fish while creating an efficient method for waste collection. The plastic debris collected from a comprehensive waste sorting would be recycled and repurposed. This would increase the fish population, help the fishermen in increasing their catch and strengthen socio-cultural and economic sustenance. The larger aim of the project is to restore the ecology of the creek and empower the community by strengthening their economy with the help of the newly established recycling industry and the fisheries. This expansion would extend Koliwada's economic reach to the city, establishing a socio-economic interaction between the two.



The proposal is envisioned to scale up and scale out across the various *Koli* communities of Mumbai.

The interventions in the project use technology as a means to empower local business and strengthen ties both within and outside the *Koli* community. Finally, the project hopes to address the issues of marginality by facilitating interaction between the *Kolis* and the rest of the city.

The Bombay 61 team is currently involved in close interactions with the community to realize the project through community participation. The main goal of the proposal is to incrementally develop the existing ancillary industries, stimulate employment, encourage the germination of more small-scale industries and restore the ecology to achieve sustenance by building resilience. ■

URBAN RESILIENCE IN CLIMATE HOTSPOTS

Making Small Towns and Settlements in Sundarbans Delta Resilient: Role of Caritas Bangladesh

Ranjon Francis Rozario, Director (Programs), Caritas Bangladesh and Sanjib Kumar Mondal, Senior Program Officer, Caritas Bangladesh

The Sundarbans is the largest delta in the world that covers an area of about 10,000 km², of which in Bangladesh extend over 6,017 km² and in West Bengal they extend over 4,260 km² lies on the Bay of Bengal. It is located in between Bangladesh and West Bengal (India). It is one of the most fertile regions in the world, it is also called as Green delta. It is one of the most densely populated areas in the world. Fishing and agriculture are the major occupations here.

The Sundarbans provide sustainable livelihoods for millions of people in

the vicinity of the site and acts as a shelter belt to protect the people from storms, cyclones, tidal surges, sea water seepage and intrusion. The main occupation of the communities are fishing, wood-cutting, honey collection, leaves gathering, shrimp fry collection, crab collection, etc.

Sea level is rising and the agricultural lands transforming to shrimp and crab farms every year. The vulnerable embankments are flooded and damaged every year during high tide and cyclonic storm with tidal surge. The livelihoods, drinking water ponds, mud roads,

wooden bridges, houses, trees, fresh water canals damaged and affected by salt water every year. The intensity of cyclone and tidal surge are increasing gradually. Regarding the vulnerabilities, a large number of people migrated to nearest cities for employment. Bangladesh is now facing the global megatrend of increasing urbanization, where half of the population lives in cities and towns. Bangladesh will soon cross the threshold as well.

At present, a large number of rural to urban migration is coming to Dhaka, Khulna and other nearest cities for

employment. Dhaka is the oldest city and where there are many opportunities for employment and income. Most of migrants from the countryside live in slums and their main occupations are day laborer, van and rickshaw puller, laborer in brick fields and the growing urbanization is now the biggest challenge of the megacity. Now, the city is facing severe environmental pollution. Severe diseases like asthma, dengue, cold, dysentery, blood pressure and other fevers. Now, it is very important to make the community of Sundarbans area as disaster proof small town. Caritas has given utmost priority to protecting the poor and vulnerable households in the cyclone affected areas. Therefore, different types of DRR activities have been undertaken including strong early warning, WASH, livelihoods, resilient housing, mangrove re-generation and institutional development. Caritas has published a manual of model housing considering different ecological contexts, nature of hazards, and culture of the community along with the need to build resilience to multiple hazards. This was done through the Cooperation of Bangladesh University of Engineering and Technology (BUET). The Government of Bangladesh has highly appreciated the manual.

Recently, Cyclone Bulbul damaged the house at Syhamnagr Upazila of Satkhira District. The most of the

poor make house wall and plinth by mud/clay soil. The random rain (7-10 days during depression) with strong storm hit the mud wall and plinth and then it damaged by strong storm.

Caritas is working with the coastal community to build resilient village just like small town. Caritas has established a Resource Centre at Shyamnagar of Satkhira district near Sundarbans to provide knowledge, education, information, inputs, research work with different institutions/Universities, training-workshop etc. for giving support to the Sundarbans community and make linkage with GOs and NGOs. Caritas also made a warehouse at Resource Centre for providing support during disaster and after disaster as emergency and rehabilitation works for the community. Caritas was involved in formulating the model of CBDP (Community Based Disaster Preparedness Program) with the collaboration with the Government and partner NGOs under DIPECHO VII project in Bangladesh.

Caritas also constructed sustainable and disaster proof ecofriendly houses using the technology of Ferro-cement in plinth making, the house plinth is raised considering the last highest water level of tidal surge water/flood during Cyclone *Aila* in 2009. The Ferro-cement technology was imbibed from Sri Lanka for

house construction works in the Tsunami affected areas.

The Government of Bangladesh has taken a policy to enable every village to avail the services of a town so that people no longer feel that they have to move.

Caritas Bangladesh has been working in the coastal areas of the country since 1970 and has been taken various initiatives to overcome these problems through implementing different projects on DRR, development works, advocacy and lobby at national and international levels. Caritas Bangladesh has taken a policy of mainstreaming DRR in all development programs to empower the community for sustaining these activities. A total of 45 school cum cyclone shelters and above 4500 cyclone resilient houses constructed in the vulnerable rural areas near Sundarbans leveraging the ferro-cement technology in plinth making.

A Cyclone Shelter cum school was constructed at Angtihar village of Koyra sub district under Khulna district in 2015. It is situated adjacent to the Sundarbans. This shelter is a three storied building where rainwater reservoir and solar system also installed.

Caritas is also working in different slums in cities and has taken various initiatives with government for the settlement of the vulnerable migrant population. Organized advocacy in different level to access in khas lands and other common properties and preparing cyclone center and hazard proof houses in rural and urban areas. Caritas is working to build the youths as skilled manpower for job creation and self-dependency.

Hope, the coastal community will be more resilient to hazards through empowerment received on community led disaster risk reduction initiatives and make sustainable and disaster proof ecofriendly villages in the Sundarbans delta. ■



Cyclone bulbul damaged houses at Shyamnagar, Satkhira.

Key Actions for Better, Stronger, and Safer Cities

By *Lamia Kamal-Chaoui*, Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD, France

As cities continue to grow, so do the risks they face. Large and complex urban systems can be particularly vulnerable to threats ranging from economic crises and social unrest to environmental disasters, which inevitably have significant repercussions not only for local residents, but also for their surroundings. However, some cities appear to be better equipped to withstand destabilising shocks and long-term chronic pressures. For example, local economies that have a more diversified economic base are likely to be more able to cope with those problems than those reliant on a single industry. What sets these cities apart? Resilience may be part of the answer. It can help cities manage, mitigate and potentially avoid the full impact of shocks as well as the persistent pressure or stress.

Resilience is intrinsic to good urban development policy. Much of the ability to withstand and overcome unexpected events lies in forward-looking urban planning practices, notably in fast-urbanising countries such as India. Risk-sensitive land use policies can, for instance, guide urban development away from risk-prone areas, increase connectivity between homes, businesses, schools and hospitals, and reduce traffic congestion and air pollution. Cities play a prominent role in resilience planning through investment and spending decisions, accounting - along with regions - for nearly 60% of total public investment in the OECD.¹ The city of London, for example, has embedded resilience in its Environment Strategy² by valuing natural capital as an economic asset, boosting measures to enhance well-being and channeling investment in resilient infrastructure. Cities with systems and infrastructure that can withstand unexpected surges in demand or extreme pressure will be stronger, safer and better equipped

to meet the needs of citizens and businesses both in times of crisis and in the long-term.

To support decision-makers at all levels in building more resilient, inclusive, smart and sustainable cities, we have developed the OECD Principles on Urban Policy, which were endorsed by 40+ countries and major stakeholder groups in March 2019.³ The Principles argue that urban development and policy is a shared responsibility, and requires designing and implementing policies across levels of government and across different sectoral policies (Principle 7); adapting policies to the specific context of cities and communities (Principles 2 & 9); enhancing interdependencies and co-operation between urban and rural areas (Principle 3); and conducting a risk assessment of vulnerabilities to minimise the impact of potential pressure on citizens (Principles 4 & 5).

Building resilient cities also requires implementing resilient governance. Citizens expect governments to be prepared for a wide range of events, and to manage them effectively, minimising damage and preventing loss of life. Ensuring safety both before and after disasters requires a whole-of-government and inclusive approach anchored in collaboration between national and local authorities and citizens in the affected areas, but also across jurisdictions since disasters do not stop at administrative boundaries. We simply cannot wait for an incident or shock to happen, before we start thinking about how to coordinate. Cities urgently need to transition from "crisis" to "risk" management in order to protect their population from both shocks and long-term pressure. The OECD report *Building Resilient Cities*⁴ (2018) assessed disaster risk management

policies in Southeast Asian cities, and finds that in the Philippines, for instance, a dedicated disaster risk management agency was established at the national level with a mandate to foster policy coherence between more than 80 regional and city-level disaster risk management offices.

Enhancing resilience calls for a flexible urban system that allows households, businesses and government to anticipate, manage and recover quickly. Similarly, future-proof urban policy should help quickly restore basic services in a crisis situation, thereby minimising the impact an incident may have on the lives of citizens already facing a great deal of stress and shock in the moment of a crisis. A critical step is for national and local governments to strengthen the innovation capacity of all actors to lead inclusive planning processes based on a wide consultation with a variety of stakeholders. This will generate not only more resilient plans and policies, but equally important widespread buy-in from the community. For example, after the 2011 mega-floods that hit Thailand, the city of Bangkok revised its disaster response strategy by working closely with local communities in order to incorporate knowledge of local contexts, propose place-based responses, and encourage a culture of resilience planning.

Building better, stronger and safer cities does not happen overnight. It requires a holistic approach that fosters monitoring, evaluation and accountability of urban governance and policy outcomes. The challenges to effectively protect cities against shocks are sizable, but equally numerous are the opportunities to better fit for the future so that greater benefits can be delivered to society. ■

¹ https://www.oecd-ilibrary.org/governance/oecd-regions-and-cities-at-a-glance-2018/subnational-government-investment_reg_cit_glance-2018-45-en

² <https://www.london.gov.uk/what-we-do/environment/london-environment-strategy>

³ <https://www.oecd.org/cfe/urban-principles.htm>

⁴ https://www.oecd-ilibrary.org/urban-rural-and-regional-development/building-resilient-cities_9789264305397-en

Making Animals in Smart Cities Disaster Safe: A View

By *KM Singh, Former Member, NDMA, India*

The Smart City Mission was launched in India by Prime Minister Narendra Modi on 25th June 2015. This mission envisages the entire ecosystem in the selected cities within the framework of comprehensive development through the lens of sustainable infrastructure characterized by inclusivity.

India is primarily an agrarian country where animals are an integral part of human life not only in rural areas, but also in cities. They are closely linked to day to day life of people even in cities, be it for security or companionship (dogs) or availability of dairy products (cows & buffaloes) or food (goats & poultry etc.). Therefore, if inclusivity and comprehensive development are the stated missions of smart cities, it should cover all lives including urban animals. Significantly, the Smart City Mission has no mention of animals or livestock.

Amongst all animals, dogs are perhaps the most important as they cannot be excluded from urban life. In India most animal bites (91.5%) are by dogs of which 60% are stray dogs (NCBI). Piecemeal initiatives to control the dog population in some of the cities have shown good results. This programme was initiated in Jaipur in 1994 with over 65% street dogs sterilised resulting in decline of dog population by 28%. Similarly, Chennai witnessed drastic reduction in dog bites from 120 to in 1996 to 5 in 2004 (Dr. Krishna SC, 2010). Jodhpur City dog population dropped by 40% within 3 years (Tottenham, 2009). To take care of

this menace, Animal Birth Control (ABC) programme was formally notified in 2001. However, this programme has been a victim of ineffective implementation.

Another major problem is stray cows in the cities. Recently, Surat Municipal Corporation has taken an initiative of putting tags on the ears of animals with a registered number which is linked to the Aadhar cards of the owners. This process helps in identifying the owner of the stray cattle.

Considering the relevance of animals in our day to day life in the Indian context, the importance and need of including animal care and safety of animals while planning for disaster resilient smart cities cannot be ignored. This issue would call for a visionary and comprehensive approach in planning of smart cities. This would include having a policy, an institutional mechanism, requisite infrastructure besides capacity building and awareness generation measures.

The broad framework of smart cities should have a well-considered policy to address issues of both community ownership and pet ownership. The policy may prescribe the number of animals that can be owned as pets

and also procedure to be followed for community animals in designated areas. As regards implementation of the policy, there would be a need to establish an institutional mechanism to effectively plan, implement and monitor. It should also ensure enforcement of Animal Welfare Acts and Rules in smart cities with online tracking mechanism.

High vulnerability of many of our cities like Mumbai, Chennai, Srinagar and Patna, etc. from urban flooding was exposed in recent years. Death of a large number of animals in these floods causing contamination of water and diseases has to be factored in planning of smart cities. It would call for requisite infrastructure in terms of construction and maintenance of safe emergency shelters along with identified evacuation routes to strategic locations for public to safely evacuate along with animals in emergency situations.

The need of appropriate capacity building in this field in the framework of smart cities may be equally important. It would include appointment and training of adequate human resources to periodically assess, treat, monitor, document and report on the health and welfare of animals and related diseases affecting both animals and people.

To conclude, it may be relevant to quote Mahatma Gandhi: *"the greatness of a nation and its moral progress can be judged by the way in which its animals are treated"*. ■

"The greatness of a nation and its moral progress can be judged by the way in which its animals are treated".

- Mahatma Gandhi

Towards Renewed and Resilient 'Green Cities': A Commitment

By Dr. Arvind Kumar, President, India Water Foundation, New Delhi, India

Climate change has emerged as a global phenomenon and is deemed as a 'threat multiplier' amplifying global risks. Successive disasters have compelled us to turn our attention to the million-dollar question: **Is the climate crisis alarming?**

In India, Himalayan States are prone to weather-related disasters including floods, cyclones, landslides, etc. The frequency and severity is expected to increase significantly leading to glaciers receding and depleting rivers, aquifers and springs. Besides weather uncertainties, factors such as unplanned urbanisation, population explosion, persistent poverty, loss of critical environmental services is a real challenge, which we all agree upon.

Large proportion of the population in Himalayan States live in cities which are extremely dependent on natural resources for basic infrastructure and flow of goods and services. The ten states face migratory pressure with increasing population influx due to Eco-Tourism that is extremely vulnerable to weather changes. We have worked in cities of Shillong, Cherapunji and are now working towards strengthening climate resilience in major cities of Shimla, Shillong, Gangtok. India Water Foundation believes that once resilience to water-induced calamities and environment-induced vagaries is enhanced, attainment of SDGs will be easier because both water and climate changes are at the root of bulk of calamities.

IWF has collaborated with local, state and national governments, likeminded partners in developing climate change adaptation services in



Meghalaya, Sikkim and now the Himalayan states. As a Knowledge partner of Meghalaya Basin Development Authority (MBDA), Government of Meghalaya, IWF was instrumental to build 'Water infrastructure' keeping water socio-economic connector which successfully bridged the gap between the social, economic and environmental pillars in the state. With the Government of Sikkim, IWF is assisting people in dealing with climate change and biodiversity challenges by providing a holistic and efficient management approach for Sustainable Water Supply Management of the State's water resources.

We are now concentrating on both hard solutions such as developing,

protecting, and adapting climate-ready infrastructure; best practices in traditional practices, development and application of adaptation technologies and soft solutions such as innovative governance systems and planning approaches, fees for intensive resource use; collaborative management of water resources through an integrated approach and associated infrastructure, services, and industries. IWF is also addressing climate and population thresholds that threaten the sustainability of communities, influence behavioral change, identifies the roadblocks to sustainable development and helps overcome them adoption of adaptation strategies and technologies

As a Catalyst for Change, we are bringing Science from Laboratory to Land and harnessing Science for Water Management at Grassroot Level. We are undertaking competence and capacity building programmes and imparting training to all sections of stakeholders, officials and users for efficient water use and water quality monitoring, awareness and also sensitization programme for the local

*IWF is supporting strategies for SDGs and influencing to adopt more sustainable practices towards **Disaster Management** which is multidisciplinary and is consistently promoting the notion of '**Disaster Preparedness**' and '**Disaster Resilience**' in both letter and spirit.*

communities in water conservation approaches and keeping water resources free from pollution.

IWF is supporting strategies for SDGs and influencing to adopt more sustainable practices towards Disaster Management which is multi-disciplinary and is consistently promoting the notion of 'Disaster Preparedness' and 'Disaster

Resilience' in both letter and spirit. Extending beyond India, as a member of CTCN, World Water Council and Accreditation with agencies of UN, GCNI, we are fostering dialogue, learning best practices in climate technology services, capacity building, collaboration in innovation, knowledge management, Policy & Planning sharing its cross-sectoral expertise in Ecosystems &

Biodiversity, Disaster Risk Reduction initiatives and disseminating them at local level. At the outset, it is important to note that Water is an important component for the survival of cities and mankind. It is essential to adopt a broad, trans-disciplinary perspective to tackle present day Disaster Risks and Build Climate Resilience, 'Putting People First' approach. ■

EQUITABLE ENERGY ACCESS

Energy and Employment in Ahmedabad: A View

Reema Nanavaty, General Secretary, Self Employed Women's Association (SEWA), India

Access to energy is an important prerequisite for all the workforce to survive. However, an internal study of the lives and livelihoods of SEWA's poor members; most of them daily-wagers, indicated that the poor workers use 40% of their time and 25% of their income in accessing energy, mainly for cooking, lighting, pumping, running small tools and most importantly in their livelihood. This traps them in the vicious cycle of less time to earn resulting in low-earning and subsequently lower standards of living. Whether it is about procuring kerosene for household needs, firewood for cooking or water for household needs, the onus of fulfilling the energy-needs of a family lies on the shoulder of the women in the family. Most of the women end-up spending 6-8 hours a day fulfilling these needs.

Additionally, women use different sources of energy like electricity, diesel, kerosene, wood etc. They spend a lot of time, energy and money in accessing these forms of energy thus having a detrimental effect on their lives and livelihood. However, due to lack of awareness, they are not able to understand this linkage between time, effort and money spent on accessing energy.

In urban areas electricity is easily available. Most of the workers have electrical meters in their homes but it is very costly. Sharing with you the example, the ready-made garment workers have machines in their home. The electric person when he comes to read the meters if he sees two sewing machines running on electricity, he will charge the commercial rate which are quite higher than the domestic rate of electricity. SEWA had to put great efforts in negotiating with the electrify company to charge the ready-made garment at domestic units. But that also provoked the thought that how can the ready-made garment workers switch to renewable energy to save electricity bill. The option was that they started using solar lights to work at the night.

Ready made garment workers are the home-based workers and most of the home-based workers work in their home. Their home is their workplace. It is just 10 by 10 feet room where they cook, sleep, greet their guests and where their children play and learn. Similarly, many of the urban poor workers live in slum. In slums also the housing conditions are the same. These small homes of the workers lack poor lighting,

ventilation etc. In such a scenario, for adequate lighting the workers use an ingenious method named as "ujasiyu" i.e. lighting hole. The workers cut the square/rectangle hole in the tin roof and make it sliding. It allows sun light when you slide it open.

Women to save money use different forms fuel. The illustrations are numerous. The wood carpenters use the wood ware and waste pieces of wood to burn the stove to boil the water and for cooking. The electrical waste recyclers of the Alang ship breaking yard use discarded waste of the ship to boil the water.

Head loaders are the workers that transport bales of cloth from one shop to another. Generally, they used to transfer the bales of cloth manually on their backs or on their heads but when there are heavier bales to transfer or there are many bales to transfer, they use push carts, paddle rickshaw or tempos (if they can afford it). SEWA to find the solution to tempo's and push carts introduced motorised paddle rickshaw to save energy. It was met with a success but needs little changes like it travel more miles.

These are some of the renewable energy used by urban poor. ■

Smart Cities Planning in India: Where do Marginalized Women Stand?

Dr. Annapurna Devi Pandey, Anthropology, University of California, Santa Cruz (UCSC), California

Studies suggest that by 2020, 70% of the world population would inhabit urban areas. If 19th century was the century of Empires; 20th century, the century of Nations; without any doubt, the 21st century is going to be the century of cities. In 2015, Prime Minister Narendra Modi launched one hundred Smart Cities Mission spreading across the country, with the paramount features as citizen friendly and sustainable. There has been lot of effort on how to make these cities diverse and disaster resilient as per the Disaster Management Act 2005. These cities are proposed to have created a sense of confidence among the population in terms of education, employment opportunities, health and sanitation. Smart Cities plan coincides with India's Skill India program initiated in 2015, which is meant to meet the employment deficit of the country, where around 90% of the workforce is located in the unorganized sector and plagued with unemployment and underemployment. In the process, young men and women will learn employable skills and move from rural interior areas to access organized employment in the cities. For example, Prime Minister's Kaushal Vikash Yojna (PMKVY), Din Dayal Upadhyay Gramin Kaushal Yojna (DDU-GKY), Ajeevika Skills, a part of National Rural Livelihood Mission, feature prominently in the agenda for economic empowerment of the unemployed youth. With a forward looking economy, new jobs are getting generated in e-commerce, energy, retail, telecom, hospitality and financial industry in the cities; but there are not enough skilled people available for those jobs.

Keeping this in view, the Government of India has adopted skill development as a national

priority. One such training program known as Sewing Machine Operation (SMO) attracts mostly women from the rural and tribal areas belonging to Scheduled castes, scheduled tribes, and other backward castes, in the age group of 18- 25, with a minimum middle school education. After a 2-3 month short skill training, these young women travel to cities in Tamil Nadu and Karnataka where they make about 6000 – 8000 rupees a month working in Multi National factories. They work 10-12 hours daily and often 6- 7 days a week. For most of them it is first time in their life to leave home, sit in a train for 30-36 hours and settle to live in big cities. Being in deep poverty, they could not further their education and the skill training provides them hope to earn money and support their family. The biggest attraction for them is to get out of a surrounding without any livelihood opportunity and low agricultural wage in the villages. As skilled workers in apparel industries, they send most of their income home. They also face numerous challenges (personal, social and cultural). My study of these workers in Bengaluru and Tirupur suggests that it is very hard for these workers to adjust in the cities. These Odia speakers face a language barrier (local language is Kannada or Tamil) and have a hard time adjusting to local food. The medical care is scanty and they remain confined to the factory premises being oblivious of the opportunities available in the city. Even though many of them realize the unequal wage and exploitation of their labor, they know that with meager means they would not be able to participate in the social and cultural life of the city. With the elaborate guidelines for the safety, protection and the wellbeing of the interstate migrant workers, the rate of attrition is high among the women.

Almost 75% of the migrants return to their villages by the time they complete the first year in the city. Primary reasons for returning often include "on leave" (35%), "marriage or engagement" (22%) and farming season (18%) (A report by Partners in Change with support from READ, Erode, 2019).

According to the March 2018 Report, at least 25% of them drop out during the training, and about 50% drop out in the first year of the job. Even with so much hype about improving the quality of life of the youth from rural and tribal areas, migration is not so easy and there is no opportunity for these women to climb up in the SMO ladder, which makes it difficult for them to join the global labor market. Most of them become typecast in their assembly line roles when they change jobs, and it is a horizontal move rather than a vertical one.

Are there ways that their lives in the smart cities around factories can be made more palatable so that young women will improve their lives as skilled personnel? In an effort of creating smart cities, I am afraid that there is not much provision for these women from vulnerable groups. Planners of the smart city should be aware of what social scientists have learned about human beings. We human beings from our socialization have learned to live in a society, in a community where we will have a sense of belonging. Since smart city is committed to the wellbeing of the citizens, their diversity and sustainability, it is incumbent upon the planners to provide means and mechanisms which citizens can avail a sense of belonging and rip the benefits for the citizens. ■

Need for Urban Irrigation for Cities in India: Making Cities Resilient

Dr. I Satya Narayana Raju, MTech, MBA, MPhil, BL, FIE, PhD, Former CE), Hyderabad, India



The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted by UN Member States on 18 March 2015 at the Third UN World Conference on Disaster Risk Reduction in Sendai City, Miyagi Prefecture, Japan. The Sendai Framework is the first major agreement of the post-2015 development agenda, with seven targets and four priorities for action. One of the goals of Sendai Framework (SDFW) is to substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals are a universal call given by United Nations to end poverty and protect the planet. The 17-SDGs came into effect in January 2016, and they will continue to guide UNDP policy and funding until 2030.

Goal No11- Sustainable Cities and Communities is to "Make cities and human settlements inclusive, safe, resilient, and sustainable."

Urban floods are one of the natural disasters that create havoc in cities dislocating normal life and damaging infrastructure. The best examples of recurring floods in Chennai Mumbai and Hyderabad cities in the recent years are an eye opener to Administrators in India. One of the reasons for such disaster is encroachment of water bodies within and surrounding those cities.

In order to make cities resilient, reviving and restoring these water bodies is the prime concern to reduce and delay run off in order to create some relief of storm water drainage congestion. Such measures significantly help urban irrigation especially horticulture, floriculture and vegetable crops to facilitate the urban population. Further by urban irrigation the ground water recharge

will drastically improve for rescue of water shortage in summer months.

Urban Rainwater harvesting which is an order of the day campaign certainly mitigates urban flooding and lead to agriculture in vacant spaces of cities including within multistoried complexes, commands under irrigation sources surrounding cities. Urban irrigation is the need of hour to realize twin benefits. The first one is to make cities resilient toward flood mitigation and the other is enhance agriculture GDP creating livelihood, production-productivity of floriculture and vegetables to the needs of urban population.

Conclusion: Urban Irrigation in Indian cities is the need of Hour toward resilient cities, mitigate floods, and enhance floriculture-vegetables production and City GDP. ■

Urban Resilience, Now

By Mihir R. Bhatt, AIDMI, India

Cities cannot continue to pursue the imperative of unsustainable development at the cost of the welfare of their citizens. We recently witnessed the callousness of our cities to the plight of millions of what have come to be called as 'migrant workers' during the pandemic lockdowns. These workers from the informal sector, on whose labour our cities have prospered were left in lurch without income, saving, food, water and even dignity during the exigent conditions of the lockdown. This is indeed ironical because cities are supposed to be the centres of culture and power! So, what is the way ahead for building urban resilience in the cities of South Asia? Let me enlist some items that have come up in this issue, some items that have not yet come up in this issue, and some items that I would like to have in this issue drawing from my own work on cities and resilience in the past five years.

One, cities must initiate and pay social assistance directly to its poor and women citizens. City specific initiatives can be designed. City and national budgets can be leveraged. And a city wide outreach to poor and women must be developed to offer social protection. Cities cannot hitch a ride on the backs of poor and working women to race to prosperity.

Two, cities must invest in education sector related resilience for its students, school to university, boys to girls. Investment in education is urban investment. Investment in schools is investment in education

infrastructure. Investment in safety of school boys and girls is investment in human capital at the most important level. Cities cannot anymore keep its students—all students—without education during and after a cyclone, flood, or a pandemic.

Three, cities must spot and encourage citizens who are leading the way to reduce risks and build resilience, especially in water and air sectors. Cities must be proactive. Cities must seek out and support leadership. Cities must be in touch with its citizens beyond city council elections. And this is especially true for cities that are facing resilience crisis in the form of water scarcity, air pollution, heatwave, and more. Cities must spot the leaders in the city who are taking action on food, water, and air resilience building.

Four, enlist and make a road map for resilience programmes that each city must undertake. Cities do not have a list of resilience action being taken in their own wards and slums by citizens. Cities do not have a roadmap to resilient cities. Without a roadmap, cities cannot reach the destination named resilience. Such a roadmap may include key major and also minor results that city wants to achieve in terms of water harvesting, tree planting, clean air, flood water management, and behavior change in urban living.

Five, cities must invest and encourage its small and medium business and industries going digital. Though there is no direct

relationship between digitalization and resilience of urban business, as a rapidly growing area digitalization must reach the thousands of city businesses and industries. Digitalisation will help small businesses better decide and connect with resilience mainstream.

Six, cities must find ways to know what is holding its citizens back to move on the path of resilience. Economy, society, technology, or culture? The barriers to move on the path of city resilience must be well studied and well known. It must be lack of urban budget, or technical skills, or ways of living in a city. Unless these roadblocks are known to each city and its scale and significance, city cannot plan and move ahead on the roadmap for urban resilience.

Seven, regular and updated tracking of who has done what and where in cities to build and manage resilience must be encouraged. Resilience must also include solid waste reduction. Reuse. Recycling. Repairing. Cities do not know what its own communities—rich and poor, businesses and workers—are doing to build and manage resilience. These acts, private and public, big and small, structured and sporadic, must be tracked, and built on so that each effort counts, and adds up to citywide resilience building actions.

Eight, cities must offer mobile, tailor made day-care centers for children and working mothers in the neighbourhood. For far too long taking care of working mothers and

infants has been left solely to the mothers and this must change. Cities must own up its working mothers and infants who will be citizens very soon. Their welfare is fundamental welfare, their wellbeing is basic wellbeing, their care is primary care for any city.

Nine, who are those who make cities resilient? And how can they be supported in private, public, and the cultural life of cities? This point relates to item three above. And such bottom up, local, citizen lead, networked, and vibrant actions must be supported by offering budgets,

space, land, technical knowhow, experience, plans, technology, and more. City resilience cannot be only top-down, big, structured, expert driven projects. The projects are useful but have their own limit.

Tenth, in the end it must be the citizens who must drive biodiversity sensitive resilience, not the policy structures or national laws or public investment alone as cities must move to lower carbon economy and higher biodiversity ecology. Biodiversity is not a rural subject. Biodiversity is not an environment related matter. Biodiversity is most

central urban matter, city concern, and citizen agenda. Laws, investments, and authorities in the city must all include concern for biodiversity in such a way that sum total of all the above actions leads the city to lower carbon economy and higher biodiversity ecology, simultaneously.

The above ten actions for cities of South Asia are both, important and urgent. Cities want resilience, and citizens want urban resilience, Now.



Photo: AIDMI.

Agenda for Urban Resilience in South Asia – Tools for the Resilience Journey

By *Sanjaya Bhatia*, Head of Office Incheon, UN Office for Disaster Risk Reduction (UNDRR), Office for Northeast Asia (ONEA) & Global Education and Training Institute (GETI), Republic of Korea

Our future is urban. By 2050, two thirds of the population will be living in urban settings. The cities that we live in now and the cities of the future need to be safe spaces where people prosper and flourish. But cities across the globe are challenged by increasing disaster and climate risk. Extreme weather events have doubled over the past 20 years and are hitting cities with increasing frequency and intensity. Rapid and unplanned for population growth in cities can lead to the construction of risk-averse housing, schools and hospitals. Internally displaced people displaced both by conflicts and natural hazards, escape to the cities, exacerbating inequality and straining cities' capacity to provide public services.

During the COVID-19 pandemic, cities are on the frontline of managing response and addressing the cascading socio-economic impacts. The World Bank estimates that 'about 100 million people will likely fall into poverty due to the impact of the pandemic. Many of these "new poor" will be people living in cities. Additionally, 'Local authorities are expected to have 15% to 25% less revenues next year' due to the acute contraction of economic activities.

The COVID-19 pandemic highlights that cities need to transition to a 'new normal'. Local authorities can use this as an opportunity to shape new and innovative policies that strengthen resilience.

The challenges faced to build safer, resilient and sustainable cities are not new and include the importance of

looking at multi-sectoral coordination; the necessity to reduce risks at their root causes and the urgency of a multi-hazard approach. These are things talked about for many years.

Tools for Resilience

Over the past decade through the Making Cities Resilient Campaign, more than 4,300 cities and local governments joined and raised awareness on disaster risk reduction and resilience, including 560 from South Asia region. The number seems large, but there is need to scale up. With this objective the Making Cities Resilient 2030 Initiative (MCR2030) was launched from January 2021. This is the result of a two-year consultation with cities, local governments, partners and stakeholders. MCR2030 is a tool that provides a clear three-stage resilience roadmap for cities; first to enhance knowledge on risk and resilience, second to put in place disaster risk reduction and resilience strategies, and finally, to support implementation and action to strengthen resilience.

Cities and partners that sign-up have access to tools and services provided by a wide range of organizations which will help them take actions and progress along the resilience roadmap.

Promoting this approach, another easy to use tool is the Disaster Resilience Scorecard for Cities which provides a set of indicators that will allow local governments to monitor and review progress and challenges in the implementation of resilience and the Sendai framework for DRR.

The Scorecard examines how systems will cope with disasters the city might experience and how to manage risks caused by these outcomes. This should be addressed through measures including:

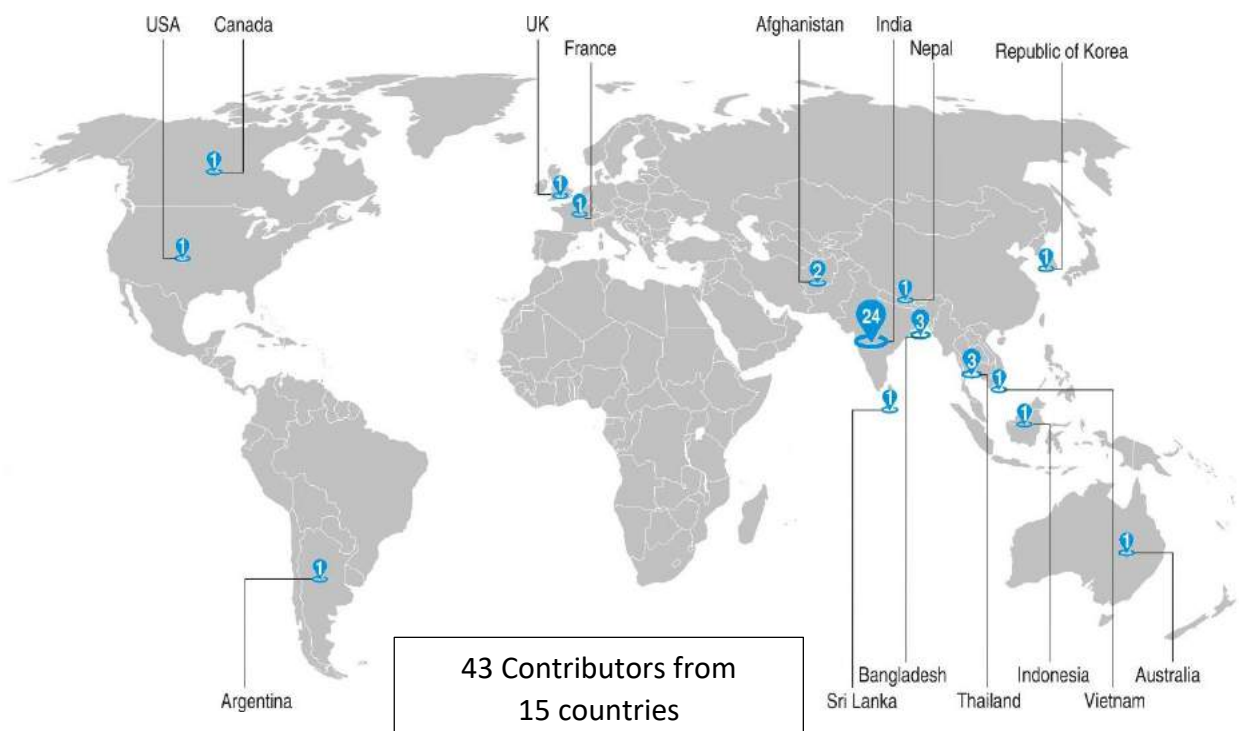
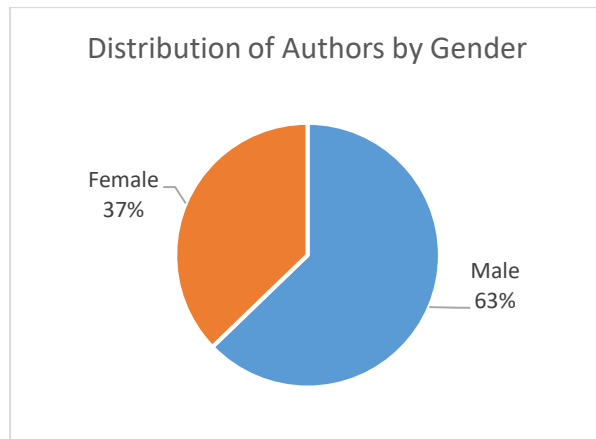
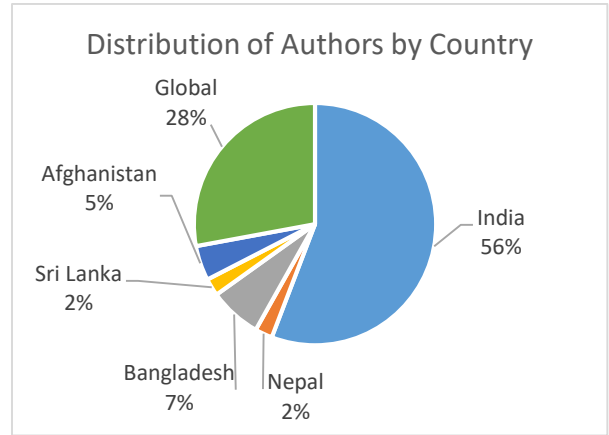
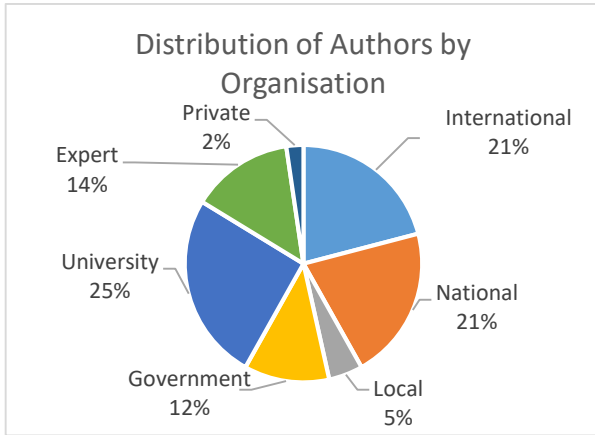
- Assessment of capacity - Consider possible linkages between different systems (for example, impact if a hospital loses its power or water supply).
- Liaising with and building connections between agencies (including those that may be in the private sector) to ensure resilience is considered appropriately in project prioritization, planning, design, and implementation.
- For emergency management, assessment of "surge" capacity, which refers to the ability to deal with suddenly increased loadings from law and order issues, casualties, evacuees, and so on.

The way ahead for cities and local governments in South Asia is to avail the benefits of joining the MCR2030 and use the tools offered including the Disaster Resilience Scorecard. ■

References:

1. MCR2030 website: <https://mcr2030.undrr.org/>
2. Scorecard: <https://mcr2030.undrr.org/disaster-resilience-scorecard-cities>

In Numbers





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