

## Towards an urban agenda on climate-related loss and damage

### Policy pointers

- Urban areas face increasing climate change risks, vulnerabilities and impacts, but the severity and distribution of these vary across and within urban centres, and are compounded by past failures to effectively reduce risk.
- As many urban centres face development and adaptation deficits, including a lack of risk-reducing measures and infrastructure, the impacts of climate change will lead to loss and damage, both monetary and non-monetary.
- Current assessments of urban loss and damage focus mainly on insurable losses – which do not account for losses suffered in the informal sector, or non-economic losses which are more difficult to quantify. Other considerations include untangling direct and indirect impacts, and assessing loss and damage from both sudden and slow onset climate effects.
- Assessing urban loss and damage in both the formal and informal sectors, and of economic and non-economic types, can provide a clearer picture of the impacts of climate change and help direct investments in urban risk management and adaptation.

The impacts of climate change in cities are already being felt as loss and damage, due to the lack of capacity of many cities to implement the necessary adaptive and disaster risk reduction (DRR) measures, and the vulnerability of large proportions of urban residents, particularly in developing countries. This paper represents a first attempt to raise some of the issues associated with climate-related loss and damage in urban areas in the global south. It reviews some of the key drivers that will shape the nature and extent of loss and damage in urban areas, explores some of the economic and non-economic approaches to loss and damage that might be taken, discusses some of the key communication challenges around the topic, and identifies some of the information and data gaps and next steps that need to be taken.

Urban climate change risks, vulnerabilities, and impacts are increasing across the world, but the distribution and severity of these vary greatly between and within urban centres. The IPCC Fifth Assessment report identifies a range of climate change impacts that are already being felt - or will be felt - in urban areas, including changes in temperature (means and extremes); drought and water scarcity; sea level rise and coastal flooding; inland flooding and hydrological hazards; and changes in the social and environmental determinants of health.

The IPCC Fifth Assessment also concludes that effective urban adaptation is possible, but that this will require infrastructure, institutions, finance and learning. While some cities are well equipped with these resources, others will experience considerable residual effects of climate change. The concept of 'loss and damage' has been emerging in recent years as a means of understanding these impacts of climate change that will not or cannot be addressed through adaptation or mitigation.

At the 2010 UN Framework Convention on Climate Change (UNFCCC) Conference of Parties in Cancún (COP16), a work programme for the enhanced understanding of loss and damage was launched; while COP19 in 2013 saw the launch of the Warsaw International Mechanism on Loss and Damage.

However, to date there has been little examination of how this concept might be applied in urban centres. While insured losses as a result of past disasters are well documented (at least by the insurance industry), much of the potential loss and damage as a consequence of climate change will fall outside this sector, particularly in cities in low- and middle-income countries. In addition, the international mechanisms that are evolving under the UNFCCC are tending to concentrate on loss and damage to rural and agricultural livelihoods, at least partially because they lack the complex web of infrastructural, social and political relationships of towns and cities which complicate quantification.

## Definitions of loss and damage

As the concept of loss and damage continues to evolve, a number of definitions have been developed. A standard definition, adopted here, is that ‘loss and damage’ arises from the residual impacts of climate change, that is, the “negative effects of climate variability and climate change that people have not been able to cope with or adapt to”.<sup>1</sup> Other definitions are broader and consider all impacts of climate change, beyond those that cannot be adapted to or mitigated for, as leading to loss and damage.<sup>2</sup> Damage refers to impacts from climate change that can be recovered, whereas loss cannot be recovered. Three categories of loss and damage can be defined: ‘avoided’ damage, which has been prevented through adaptation or mitigation; ‘unavoided’, which refers to a failure of preventing avoidable loss and damage due to a lack of necessary adaptation or mitigation measures; and ‘unavoidable’ damage and loss which measures cannot prevent.<sup>3</sup>

## Key considerations for urban loss and damage

Loss and damage as a result of climate change will take place when:

- existing coping or adaptation strategies are inadequate to deal with the extent of the physical impacts of climate change;
- the costs (including non-economic costs) of measures to address impacts cannot be regained;
- short-term actions to reduce risk have negative effects in the longer term;
- there are no possible measures to address the impacts of climate change.<sup>4</sup>

This loss and damage can be a result both of extreme events (of the type which will become more frequent and/or more severe as a result of climate change), or of slow onset changes (such as the gradual erosion of coastal land as a result of sea level rise). While much of the focus of the insurance industry is on single substantial events (or ‘intensive risk’), there is a growing body of evidence that highlights the significance of everyday hazards (or ‘extensive risk’) in damaging the assets and well-being of low-income urban residents.<sup>5</sup> The factors that limit the effectiveness of adaptation actions to reduce loss and damage may be physical (the extent of the change may preclude effective actions), but are more likely to be due to limits in institutional and individual capacities and awareness, as well as financial constraints. For example, while New York City has been able to identify almost US\$20bn of funding to build resilience in the wake of Superstorm Sandy,<sup>6</sup> few if any cities in Africa or Asia would be able to mobilise similar resources.

Accounting for loss and damage in urban centres requires assessing how this affects both the city as a whole and the lives and well-being of urban residents (particularly

the poorest and most vulnerable). The former includes infrastructure systems (water and energy supply, sanitation and drainage, transport and communication), services (health care, emergency services), the built environment, ecosystem services and biodiversity, and the urban economy (financial impact). The latter may include loss of life, damage to health including mental health, direct financial loss (through destruction of housing or other assets), and loss of productivity (including from the time spent responding to impacts). These different types of loss and damage require assessment in different ways – as the following section explains, some of the losses are quantifiable in economic or other terms, while others are less amenable to this type of analysis.

## Assessing loss and damage: economic and non-economic methods

Assessing loss and damage in urban areas will require identifying *what* has been affected, and *how* it has been affected. This will help to determine whether the loss and damage can be accounted for in economic terms or not, and how this may be done. The type of loss or damage suffered will differ according to whether the climate impact is slow or sudden onset – a cyclone may cause immediate physical damage, whereas rising temperatures may gradually increase energy demands, which could in turn overload energy systems in the longer term. In addition, certain types of loss and damage – for example, to traditions and heritage – are unquantifiable, while others can have a monetary value assigned to them.

Loss and damage that can be quantified economically can come in various forms, including physical impacts, productivity loss, and supply chain disruption. In many cases, economic losses are insurable and therefore data is gathered by insurance companies, though often not made publicly available. Even so, there are challenges to obtaining the full picture, as the multiplier effects of different hazards will vary, and may stretch beyond the boundaries of a city, as seen by the worldwide effects on computer and car manufacturing initiated by the 2011 Bangkok floods. One starting point is to distinguish between direct and indirect loss and damage, accounting for private loss and damage (which includes individuals, households, and commercial enterprises) and public loss and damage (encompassing infrastructure and services).

However, a large proportion of the urban population of developing country cities are economically active in the informal sector, and live in informal settlements – and the losses and damages suffered here will not be taken into account through formal measures such as insurance data, despite being hugely significant to the local economy and local livelihoods (even if their monetary value is relatively small). If these losses and damages were accounted for, they could help to highlight which climate adaptation investments need to be made and where.

Non-economic loss and damage includes items and assets not commonly traded on markets, or not formally accounted for, posing a challenge in terms of assigning a monetary value to the lost or damaged items. In the context of low- and middle-income countries, non-economic loss could be more significant than economic loss.<sup>6</sup> Certain

assets and resources may have both economic and non-economic value: for example, urban ecosystems provide services like food (that can be traded in the market), play a role in regulating the local environment (which can be ascribed a monetary value because of the avoided costs of using other methods to do this), and also have intrinsic values (such as the conservation of biodiversity), which are much more difficult to capture in monetary terms. This difficulty means that loss and damage may be underestimated, affecting consequent climate adaptation planning.

In order to fill this gap, sectoral entry points may be used to assess non-economic loss and damage such as:

- **Health:** climate change impacts may affect the health of an individual in different ways, from injury, to vector borne diseases, mental stress and even loss of life following an extreme event. There may be challenges regarding attribution, particularly with slow-onset climate impacts, or in the period following extreme events.
- **Ecosystems:** these can play a role in regulating the local environment, and provide services to urban areas through a variety of means, from the individual to whole sectors of society. The complex interconnections of ecosystems to the urban system may be challenging to disentangle through economic valuation tools. Some climate change impacts may cause irreversible damage to or loss of ecosystems.
- **Rights and identity:** climate change impacts may erode the ability of individuals and groups to participate in mechanisms to ensure voice and representation, which may also provide local avenues for risk management. Climate change impacts could erode social capital, cultures and heritage which may be tied to particular neighbourhoods, traditions and places of worship.

Assessments of the non-economic dimensions of loss and damage can provide an understanding of the scale of immediate and indirect impacts arising from climate change. These assessments are also important for understanding the form, nature and structure of differential access and vulnerabilities of certain groups of people

across the dimensions of basic services, rights, health and livelihoods, and how urban systems shape this. They can also help to illustrate the multiple dimensions of institutional processes (both formal and informal) that exacerbate exposure and vulnerability, or that can help to build adaptive capacity.

## Communicating urban loss and damage locally and globally

Loss and damage in the urban environment requires attention at multiple levels, including local and national governments, businesses and civil society, and international organisations. Increased awareness and understanding of the costs associated with climate-induced loss and damage could drive action to build adaptive capacity and accountability in urban areas, and facilitate the implementation of the required adaptation policies to reduce future losses.

Highlighting the nature of climate-related urban loss and damage would help to further emphasise the need to integrate climate change adaptation and disaster risk management policies into strategies and action, including urban and infrastructure planning and institutional development, with the ultimate goal of sustainable development, ensuring poverty reduction and building urban resilience to climate change. More specifically, the loss and damage lens enables the generation and provision of reliable data and evidence about the costs arising from loss and damage, and evaluation of current loss and damage approaches (risk reduction, risk retention, risk transfer) can help to demonstrate the costs incurred from taking insufficient action, thereby incentivising public and private investments to minimise future climate-induced losses.

Actors and stakeholders at different scales need to be involved in addressing urban loss and damage. Local and municipal governments need to provide the necessary services and infrastructure to reduce risk to vulnerable populations, while national and sub-national governments should provide the necessary regulatory framework for the implementation of action plans. The global climate

## Methodologies for assessing loss and damage

A variety of tools are available to assess monetary losses. These include traditional accounting tools such as aggregating stock and flow variables; actuarial calculations; input-output methods and computable general equilibrium models. These all require data of sufficient quality, which may not be easily obtained.

Assigning values to non-economic losses may require mixed methods. Qualitative approaches include case studies, household surveys, focus group discussions, and key informant interviews. Quantitative approaches included revealed preference and stated preference methods (such as contingent valuation). These can be

used alongside geospatial tools and perception analyses and surveys.

Cost-benefit analyses may inform the choice between repair and reconstruction following an event, and between pre- and post-event investment in infrastructure – in certain cases, such as with slow onset impacts, it may be more cost-effective to delay investment in adaptation or consider alternative options. The selection of the appropriate discount rate will be important in such calculations, as will accounting for time lags in climate impacts.

change community should facilitate funding mechanisms for urban climate resilience, alongside national and sub-national programmes and policies – this is a critical issue that should be addressed in the evolution of the Warsaw International Mechanism on Loss and Damage.

## Advancing the urban loss and damage agenda

Climate-induced loss and damage is already a reality and, with many cities lacking the capacity to take necessary DRR and adaptive measures, will have consequences for vulnerable urban populations, particularly in low and middle-income countries. Yet, loss and damage remains an emerging field, with scope for further research and pilot projects, and for methodologies to evolve. This is particularly the case for fully capturing non-economic losses in all their forms, as well as economic losses suffered in the informal sector. This could be informed by examining cases from different cities and the various sectors within these, in the context of past disaster events, which offer valuable learning opportunities.

More fundamentally, there is still a need for research to explore the underlying drivers shaping loss and damage at the city scale. This will require the construction of city profiles that map hazard exposure, risk-reducing infrastructure and services; analysis of institutions and policies including DRR measures and what hinders or supports their implementation; and documentation of the investment capacity available to address these. Additionally, the underlying drivers shaping

loss and damage at the level of individuals and communities need to be understood and addressed: these include internal factors such as age, gender and health; external factors such as quality of shelter and service provision; and adaptive capacity. The intersection of climatic and non-climatic drivers, such as land use change, will also affect loss and damage.

Loss and damage processes should be considered alongside urban adaptation and mitigation, in both research initiatives and in guiding policy and regulatory frameworks. The contribution of urban areas to national growth should be recognised, and the need to build urban climate resilience acted upon accordingly – while recognising inequalities in exposure and vulnerability within urban areas. Techniques could be developed to assess avoided loss arising from particular policies or investments in urban areas, such as infrastructure, which could be seen as a return on urban investments. In certain places, positive convergence is happening between development and adaptation strategies, creating the potential for transformative adaptation to address the underlying drivers of loss and damage.

As with climate change adaptation and mitigation, there is a need to identify knowledge gaps, policy gaps and institutional gaps, to build capacity at each level, and to sensitise communities and other relevant actors, such as the insurance sector. More research is needed in all these areas to draw firmer conclusions.

## Aim of Series:

The series has arisen out of the Asian Cities Climate Change Resilience Network (ACCCRN), an initiative funded by the Rockefeller Foundation – more information can be found at [www.acccrn.org](http://www.acccrn.org)

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## Notes

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