WHAT DOES **SOCIAL INCLUSION** MEAN FOR A RESILIENT CITY?

A POLICY NOTE ON URBAN FLOODS

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Cities today face an unprecedented risk of natural hazards compounded by serious governance challenges. How can cities ensure that in building resilience, they address the needs of those most at risk of being excluded? How can they develop strategies that simultaneously foster resilient infrastructure and social inclusion?

This note focuses on urban floods—one of the most pervasive forms of disasters that strike cities—and illustrates who may be left behind, and how building city resilience and social inclusion can work together. It is intended to stimulate thought and debate, and to lead the way for a more in-depth analysis of the problems and solutions, and towards more effective and sustainable city resilience.
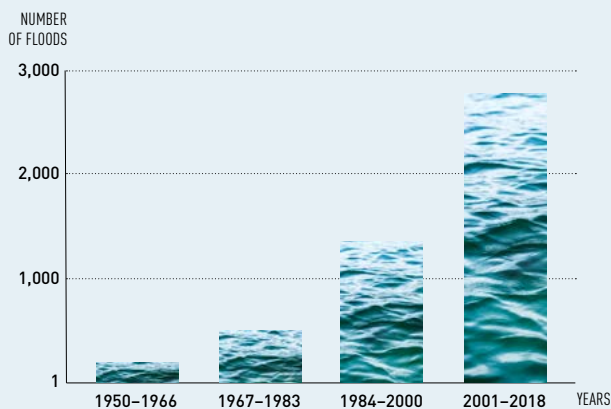
Why Focus on Urban Floods?

Sixty-five percent of the world's urban population lives in coastal areas, and by 2025, almost three-fourths are expected to do so (UN-Habitat 2011). Most megacities are located either on seacoasts or linked to riverbeds. According to the International Panel on Climate Change (IPCC 2012), by 2100, it is a near certainty that sea-level rise will contribute to upward trends in extreme coastal high-water levels. Potential hazards in coastal areas and cities built near rivers arise from coastal flooding, beach erosion, sedimentation in river floors, and landslides. These hazards will be intensified by the increased frequency of strong tropical storms (Gencer 2013).

Figure 1 shows the increase in floods over time. In most metropolitan areas, floods account for almost half of all natural hazards. The last decade has seen some catastrophic floods in cities across the world, with reports of an increase in chronic flooding as well.

Figure 1: Floods have increased over time

NUMBER OF FLOODS

3,000

2,000

1,000

1

1950–1966 | 1967–1983 | 1984–2000 | 2001–2018   YEARS

Source: Global Commission on the Economy and Climate 2018.

What is Resilience?
The World Bank uses a working definition of resilience as "the ability of a system, entity, community, or person to adapt to a variety of changing conditions and to withstand shocks while still maintaining its essential functions."
World Bank 2014, 8

Flooding in urban areas affects Organisation for Economic Co-operation and Development (OECD) and non-OECD countries alike.[1] A dearth of research on the "hidden challenge" of floods in the United States led to the first-ever nationwide assessment of urban flooding in 2018 (Galloway et al. 2018). In this study, a survey of public and private flood-management professionals across 48 states concluded that urban flooding is a growing source of economic loss, social disruption, and housing inequality, and that the social impacts of flooding are generally not well understood by many public officials nor by the unaffected public. While multiple communities across the world face urban flooding challenges, each incident has unique hydrological, physical, and social characteristics. And while the magnitude of urban flooding challenges requires federal-level policy and institutions, solutions are best developed and implemented at the local level.

Urban floods are sometimes the result of catastrophic weather events, but they often assume a more chronic nature. Many low-lying areas experience flooding during normal rains. Often these areas are inhabited by informal settlers or by residents who lack access both to government services and to political influence. Lack of roads, poor drainage, and poor solid-waste management can contribute to and compound the negative effects of floods. Lack of a clear delineation of roles and responsibilities in the city governance structure compounds the problem.

Consider two of several areas that are at heightened risks due to urban flooding—one in Indonesia and the other in Peru. In the former, the cities of Jakarta, Bandung, and Surakarta accounted for 39 percent of the disasters impacting the nation's metropolitan areas, with all three far exceeding the average of 173 events between 2003 and 2017.[2] Across many cities in Indonesia, as in other parts of the developing world, poor solid-waste management and a lack of

community awareness about it contribute to flooding. In addition, sea-level rise is of special concern in Jakarta because parts of the city are already subsiding due to the over-exploitation of groundwater and soil compression from heavy construction. The areas that are most vulnerable to inundations from tidal waves and riverine flooding are inhabited by Jakarta's poorest, who live in informal settlements.

In **Peru**, situated between the Pacific Ocean and the Andes, the capital city of Lima is prone to floods, mudslides, and landslides as well as to earthquakes. With the Pan-American Highway linking Lima to other port cities, rapid urbanization along the coastline has contributed to increased levels of risk (UNISDR 2010 (1): 60). In addition, within the last few decades, poor urban planning has led to informal squatter settlements that have proliferated around the fringes of Lima, on unstable alluvial soil along riverbanks or hillsides (Oliver-Smith 1999, 248–94).

Flooding in cities and towns distorts markets and services for residents, and puts municipal governance to the test. As the effects of floods on the lives of citizens occur through several pathways—earnings, education, health, transport, and others. For instance, students end up missing days of school, workers lose time and earnings, drinking water gets contaminated, vector diseases proliferate, and regular services are interrupted. Floodwaters also often enter homes, causing serious health and hygiene hazards, loss of assets, even apart from the inconvenience and the repair costs.


Who Is at Greatest Risk during Urban Floods?

Throughout the world, poor people are overexposed to urban floods This stands in contrast to rural flooding, which threatens both poorer and more well-off households equally. Some cities where poor people suffer disproportionate impacts of floods are coastal cities, where more frequent flooding is expected in the future, such as Mumbai, Ho Chi Minh City and Jakarta. Problems created by living in a flood-prone area are compounded by secondary effects, such as the loss of hourly wages when a flood prevents people from traveling to work, or from hours lost to traffic detours (Galloway et al. 2018). A case study of the floods in Chennai, India, in 2015, describes the ways in which catastrophic floods affected the city and its residents (Chakraborti and Rajasekhar 2017). And some impacts on health or education from flooding can be irreversible. For example, in Mexico, once children have been taken out of school, even for a temporary traumatic event such as a flood, they are 30 percent less likely to proceed with their education as compared to children who remain in school (de Janvry et al. 2006).

While the relationship between poverty and exposure to urban floods is clear, it is less so between excluded groups and their vulnerability to such events, or their ability to cope and recover. Excluded groups are often (though not always) poor. They comprise, inter alia, migrant workers, the elderly, persons with disabilities, and people working in trades and jobs that are particularly susceptible to disruption during natural hazards, such as street vendors or waste pickers. Figure 2 highlights the intersection of social identities that cause disadvantage. Oftentimes the response to floods can exacerbate existing forms of social exclusion—for instance, people of a specific ethnicity, race, caste, or place of origin may be left out of the evacuation or relief process, because they have

Figure 2: Social identity often drives exclusion
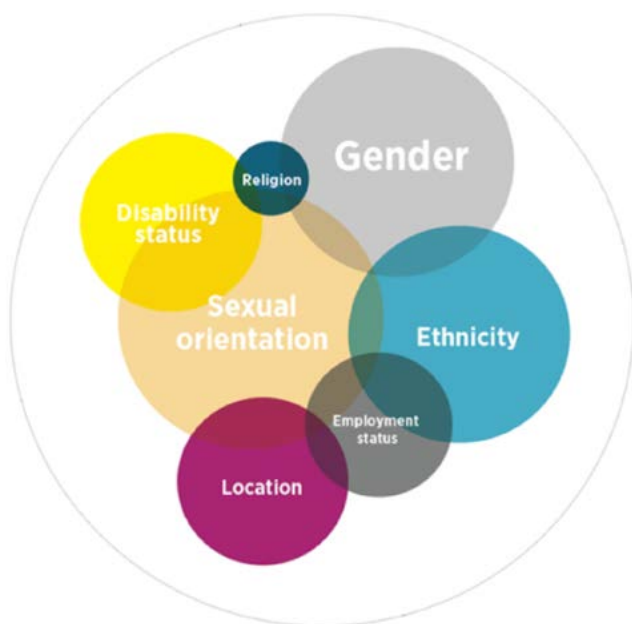
Source: World Bank 2013.

less power, weaker voice or are actively discriminated against. Spotlight 1 shows how street traders in Ghana described the effects of floods.

Persons with disabilities face unique challenges during emergency and disaster events. These challenges can be due to several factors such as poor accessibility, warnings and evacuation notices not reaching them, and being left out of shelters, camps, and food distribution. They can also be excluded from long-term recovery efforts (for example, see Tarisayi [2014]). Persons with mobility challenges may become homebound during floods. Persons with disabilities may also be more affected by a disruption to physical, social, economic, and environmental networks, such as a breakdown of support systems. They may be more likely to be left behind or abandoned during disaster evacuations; they may be separated from their family members and caregivers, as well as from their assistive devices (for example, wheelchairs or prosthetics), or may be unable to operate electrical devices during a disaster. Weak data on persons with disabilities and limited knowledge on how to respond to their needs are additional factors that heighten their vulnerability in a disaster or emergency situation (Smith, Jolley, and Schmidt 2012). Further, resources and necessities may become scarce during a disaster

situation, increasing the chance of discrimination on the basis of disability. Also, disasters themselves can cause disabilities among the population from injuries suffered, requiring urgent medical attention and rehabilitation resources, as experience from several disasters has shown. Yet persons with disabilities are not passive sufferers. They also exercise their agency in the wake of catastrophic events and use their informal and formal networks to tide over shocks.

The gendered impacts of urban floods deserve special mention, in part because many anecdotes emphasize female vulnerability during disasters. Such anecdotes persist despite the widespread knowledge that women and men are heterogeneous groups and not all women are vulnerable. For example, a historical review by Doocy et al. (2013) indicates that males are more likely to die in developed countries during catastrophic floods while females have higher levels of mortality in developing countries.

The gendered impacts of floods in urban areas (as in other areas) are mediated by various factors including occupation, assets, access to services, and the degree of voice and agency that each group can exercise. Ajibade, et al (2013) for instance, explored the gendered effects of flash floods in Lagos, Nigeria, and found that women did not report concerns regarding gendered impacts of flooding. However, the evidence showed that, the impacts were in fact differentiated by gender and income level. Women in lower-income neighborhoods experienced more intense negative impacts and took longer to recover, compared to other groups. The results were statistically significant only for the differences between low-income and high-income neighborhoods, but not between middle-income and high-income neighborhoods. Another study (Abiona and Koppensteiner 2016) looked at the effects of rainfall shocks on domestic violence in Tanzania, and found a positive correlation, but also showed that several empowerment variables attenuated the negative effects. These examples illustrate the diversity of women's experiences, the fact that the intersection of gender and income confers the greatest disadvantage, and also the fact that women's agency is important.

Location matters in general, and especially in relation to urban floods. Some groups are spatially excluded because they live in high-risk areas and lack voice, infrastructure, and services. These groups may live on fragile lands, in informal settlements, or in low-lying areas, or have precarious housing situations. They may lack resilient infrastructure, and their schools, homes, and health centers may be the last to be rehabilitated. Urban residence patterns across the world highlight the intersection of social and spatial exclusion (World Bank 2013). Hurricane Katrina is the starkest recent example of how the adverse effects of disasters disproportionately affect the poor and people of color, and how resources for resilience are unequally distributed (Mohai, et al 2009; Rodríguez and Russell 2006; Satterthwaite 2008). Much of the locational disadvantage that some groups face has to do with poor management of urban land and housing markets.

Catastrophic flood events in rural areas may lead to the forced migration of residents to cities and towns, testing the resilience of the more urban areas.
The inflow of migrants who escape a disaster places additional burden on city infrastructure. For example, cities such as Karachi, Pakistan, receive waves of migrants who want to escape natural hazards in their villages. Forced migrants tend to be the most bereft of resources and possibly the least-welcome individuals in a city. In Kochi, India, for example, most migrant workers settle in the city's outskirts, in neighborhoods such as Alwaye, Perumbavoor, Kalamassery, Eloor, and Costal Ernakulam (Jaswal et al. 2015). These locations are themselves prone to flooding and waterlogging during monsoons and are surrounded by wetlands or close to bodies of water. Many of these habitats may also be polluted by industrial waste and sewage from chemical and allied industries in the city, making them more hazardous to residents.

The impacts of natural hazards, and of urban floods in particular, are not socially neutral; neither are relief, recovery, and reconstruction processes.
These processes are each socially differentiated and can reinforce pre-existing exclusionary dynamics. Therefore, they become matters of social inclusion and justice. Moreover, the effects of resilience can conceal "the continuing reproduction of hierarchical power relations" (Joseph 2013, 41). Some researchers also assert that inequality and social exclusion lead to greater environmental degradation, and that a more equitable distribution of power and resources would result in improved environmental quality (Agyeman et al. 2002; Boyce et al. 1999; Solow 1991; Stymne and Jackson 2000).

How Do Communities React to Urban Floods?

Communities and households that experience frequent flooding practice resilience on a daily basis. They often have no choice but to adapt to the predictable nature of their reality—chronic floods. When both the state and markets fail them, communities and households react by developing a web of informal strategies, institutions, and networks. For example, during and after flooding, makeshift schools may emerge in a neighborhood; supplies may be sold by spontaneous community entrepreneurs; emergency transport may be provided by local youth who have access to bicycles or motorbikes. Adaptation becomes a way of life.

In addition to adaptation, mitigation becomes a way of life, based primarily on informal and private solutions. For example, households may invest in suction machines that pump water out of homes and lanes; communities may pool their resources to hire drain cleaners before and during the rains. In less-sustainable solutions neighborhoods may ensure that solid waste does not clog their own drains but is deposited in another neighborhood. This situation may lead to inter-neighborhood clashes and violence.

All too often, state-sponsored solutions to flood risk management do not consider communities as being active partners, with top-down initiatives often being the norm. However, shared decision-making on urban water supplies, sanitation, and solid-waste management can create resilient communities, and help cities adapt to a rapidly changing climate. To build local-level collective resilience, governments and communities need to reduce inequalities in risk and resources, engage local residents in mitigation, build strong civic leadership, create organizational linkages, boost and protect social capital, and "plan for not having a plan," which requires flexibility, decision-making skills, and trusted sources of information that function in the face of unknowns (Norris et al. 2008; O'Neill 2016). The next section outlines some examples.
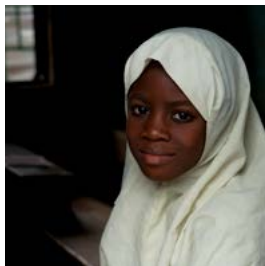
What Do We Know about Initiatives that Enhance Inclusion in City Resilience?

Much of the literature on local-level resilience to floods comes from rural settings. While the experience of rural areas informs the knowledge base, some examples of urban initiatives are also highlighted, below.

Community-driven initiatives are often the strategy of choice when disaster strikes and when both states and markets are unable to respond. Communities organize spontaneously in the face of flooding, but specific formal initiatives are often sponsored by governments and external agencies. Community resilience activities include bottom-up approaches that make use of social networks and support autonomous adaptation based on the experience of the poor and of excluded groups (Arnold et al. 2014). Such initiatives also support communities in diversifying and developing fallback options, and enhance social learning and sound governance as forms of regulatory feedback (for instance, building capacity in participatory approaches to scenario-based planning or measures to increase social accountability in the use of public finance for climate change response).

Several social protection programs, especially social safety nets and other cash-transfer programs, have a successful track record in both mitigation and adaptation to disaster and other shocks. For example, Argentina, Brazil, and Peru have shown the importance of having an inclusive recovery system via social protections for disaster resilience.[3] In fact, the benefits of a more inclusive recovery increase with the level of pre-existing income inequality (Hallegatte et al. 2018). While most of the evidence comes from rural areas, the lessons are highly applicable to urban floods as well. The Asian Development Bank highlights

some of the ways in which these benefits can be achieved (see Spotlight 2).

While many cities have innovated and experimented with initiatives that seek to strengthen communities, municipal governance, and infrastructure, few of these initiatives have been well-documented. This section provides examples of cities in Indonesia, Brazil, India, Thailand, Vietnam, and Mexico that have engaged with communities in the resilience process.

Indonesia's experience demonstrates that communities are key to emergency and response activities. For example, in December 2016, **Bima** experienced flash floods, originating from the Padolo River and the Wawo District, that inundated large parts of the city (with up to three meters of water), flooding thousands of houses and displacing over 115,000 residents—more than two-thirds of the city's population at the time. A key strength of the community network was the rapid sharing of

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SPOTLIGHT 2

Social Protection Measures to Adapt and Mitigate against Floods

Ex-ante support to reduce risk and strengthen coping capacity by:

- Increasing household savings to deal with climate change and disaster-related shocks and stresses, particularly for vulnerable groups

- Enabling accumulation of productive assets

- Strengthening resilience of community infrastructure

- Creating community assets that strengthen resilience

Ex-post support to facilitate effective recovery and strengthen adaptive capacity by:

- Smoothening consumption during lean times

- Enabling continued access to education and health during disasters

- Enabling post-disaster recovery of sustainable livelihoods

- Supporting post-disaster recovery of resilient community infrastructure

Source: Asian Development Bank, 2018.

information to assist with response actions. Since the 2016 flooding, various measures have been taken to improve the city's flood resilience, such as the rehabilitation of affected areas, the normalization of river channels, the relocation of people living in floodplains, improvements to urban infrastructure, the strengthening of river dikes, and the sustainable reforestation of land in upstream areas.

Brazil provides three examples of city engagement in the resilience process. In Teresina (Das 2017), a project called "Enhancing Municipal Governance and Quality of Life" was intended to modernize and improve the municipal government's capacity to protect poor residents from perennial flooding in the Lagoas do Norte region. This project involved the resettlement of at-risk persons to safer areas, and expanded access to sanitation and water services for the resettled families. In a second phase, the project received additional financing and focused on both strengthening community associations to improve access to basic services and to daycare providers, and on activities for crime and violence prevention targeted to the most vulnerable groups, such as Afro-descendants. As part of the violence prevention activities, the project focused on ex-ante diagnostics of the problem, job training, public awareness campaigns, and support services for survivors of violence. In all these activities, there has been a focus on both men and women (Das 2017).

In another case, the World Resources Institute worked with municipal governments and local partners to pilot a planning tool[4] in seven poor urban communities—

two in Rio de Janeiro and five in Porto Alegre. Both Rio de Janeiro and Porto Alegre grapple with climate risks, fatal flooding, and unequal urban growth. Both are members of the 100 Resilient Cities (100RC) network (https://www.100resilientcities.org), which enabled them to develop urban resilience strategies (McGray and Elias-Trostmann 2014). The overarching findings were that cities should focus on urban planning and services, measure social networks by their strength rather than their size, and improve communications and training.

In another example, an educational project in **São Luiz and Cunha** connected various aspects of disaster risk reduction with communities through a dialogue-oriented learning process. The process linked municipal civil defense systems, high school students and teachers, local communities, universities, and Centro Nacional de Monitoramento e Alertas de Desastres Naturais (CEMADEN) researchers. Marchezini et al. (2017) documented how the educational system and young people can be involved in early warning systems by integrating disaster risk reduction into school curricula and adopting citizen science and crowdsourcing approaches. The project adopted several additional empowering activities, including peer education and the intergenerational transfer of knowledge.

In **India,** several states have experimented with developing resilience to floods. For example, the **Surat Municipal Corporation** (SMC) established an Urban Health and Climate Resilience Cell (UHCRC) to provide support services, such as the documentation of health and climate challenges, to the SMC health department. The UHCRC also engaged in advocacy for health, gender equality, and equity in urban and climate resilience. This approach has helped reduce both flood impacts in cities and hardship for migrants who tend to live in flood-prone peripheries of cities (Jaswal et al. 2015). In another instance, in **Odisha**, Cyclone Phalin led to significant reductions by residents in all household expenditures, with these reductions being the largest for women. A program called Tripti, implemented by the government and supported by the World Bank, mitigated some of the reductions in household nonfood expenditures and in women's consumption, working, inter alia, through women's self-help groups (Christian et al. 2018).

BEFORE THE VUUP PROJECT

AFTER THE VUUP PROJECT

Thailand and Vietnam provide additional pointers. In the aftermath of one of **Thailand's** worst floods in 2011, a community-driven rehabilitation program, supported by the World Bank and implemented by the Community Organization Development Institute (CODI), provided financial support for small infrastructure projects, housing repairs for flood affected individuals and households who were struggling to recover, and income support for community members to conduct the construction work themselves. CODI included community-based targeting and prioritization.[5] The **Vietnam Urban Upgrading Project** (VUUP), also supported by the World Bank, focused on community participation, especially in monitoring the time and frequency of floods, identifying contextual causes, and developing housing designs with community inputs. VUUP also facilitated economic activities in flood-prone areas to mitigate the effects of flooding, particularly through loans to communities to engage in productive work.

Lasting resilience is only possible if community-based strategies are seen as a core part of governmental and private sector efforts. For example, a study by Julio-Miranda et al. (2018) analyzed the efforts of a neighborhood in **Mexico**

to build resilience to flash floods. The community used strategies independent of those of the local government, with the overall result being a significant increase in resilience. The community's ultimate goal was to generate effective collaboration between community members and risk managers in a successful governance framework (Joerin and Shaw 2012; López-Marrero and Tschakert 2011).

A study of the 2015 floods in Chennai, **India**, showed that both the state and communities worked together and made effective use of technology and social media to the benefit of the relief and rehabilitation process (Chakraborti and Rajashekhar 2017). More recently, in Kerala, communities, civil society, the private sector, and the state worked seamlessly in response to catastrophic floods.

In **Thailand**, a study of Bangkok's urban fringe—an area prone to chronic flooding—found that localized adaptation strategies have positive effects on communities. However, the disconnect between the private sector, the government, and communities has often led to negative outcomes (Limthongsakul et al. 2017). Yet once an extreme event passes, federal, state and local governments often return to business as usual, leaving households and communities to plan for

Conclusion

This note provides three clear policy takeaways:

First, municipal governance and capacity are necessary preconditions for city resilience. The causes of urban floods need to be addressed upstream. In other words, mitigation is in some cases even more important than adaptation. For example, cities should ensure that solid-waste management is well-organized, clear mandates exist for service delivery, and good regulations are in place and enforced effectively and transparently. They should additionally address the distortions in land and housing markets. Sustainable city resilience can only be built on a robust system of municipal governance, where functions and responsibilities of different tiers of governance are clearly delineated.

Second, and related to overall municipal governance, lasting city resilience will come from city governments, service providers, and the private sector being accountable to city residents. This observation follows the *World Development Report 2004* (World Bank 2003), which emphasized the importance of three actions, namely the voice of residents being heard through structured mechanisms, of feedback loops implemented between providers and residents, and of ensuring systematic information flows between state and non-state actors. A corollary of

this observation would be that cities view community-level adaptation as integral to their mitigation and adaptation efforts, instead of being small, local, parallel, and separate.

Third, it is the abiding responsibility of city governments to know who is likely to be left out of efforts towards city resilience, through which channels, and in which ways. The premise of the World Bank's inclusion framework is to ask the right questions for the best possible interventions (World Bank 2013). The **Social Inclusion Assessment Tool** (SiAT) provides four simple guiding questions for ex-ante analysis, both in response to catastrophic events (as a part of the post-disaster needs assessment), and more importantly, during times of stability, to help plan for both chronic and severe flooding (World Bank n.d.). The SiAT is meant to help policy makers, development practitioners, and communities assess how social inclusion can be addressed in projects, programs, policies, or analysis.

In conclusion, this note is intended to spark discussion and debate about how social inclusion can become intrinsic to building urban resilience. It is imperative to have more structured and informed conversations between a variety of state and non-state actors, so as to have greater impact on both

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Endnotes

[1] FEMA defines urban flooding as "the inundation of property in a built environment, particularly in more densely populated areas, caused by rain falling on increased amounts of impervious surfaces and overwhelming the capacity of drainage systems. It excludes flooding in undeveloped or agricultural areas. It includes situations in which stormwater enters buildings through a) windows, doors, or other openings; b) water backup through pipes and drains; c) seepage through walls and floors" (Galloway et al. 2018).

[2] Data are from Indonesia's National Disaster Management Agency (Badan Nasional Penanggulangan Bencana – BNPB).

[3] The Rapid Social Response (RSR) - Grant for Disaster Relief and Reconstruction (GFDRR) partnership at the World Bank has helped support a variety of activities in countries with varying degrees of social protection systems.

[4] A new World Resources Institute paper (Elias-Trostmann, et al. 2019) introduces the Urban Community Resilience Assessment (UCRA), a planning tool designed to help cities measure various needs for climate resilience.

[5] Community-based Livelihood Support for the Urban Poor project, http://www.worldbank.org/projects/P143770/community-based-livelihood-support-urban-poor?lang=en.

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