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The perspectives of the urban poor in climate vulnerability assessments – The case of Kota, India

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ABSTRACT

Kota with a high proportion of slum dwellers and extremely high temperatures is under great demand to assess the vulnerability and adaptive capacity of different groups of its inhabitants to the impacts of climatic variability and change. Participatory workshops with key stakeholders in urban administration undertook a short vulnerability assessment to gauge current climate adaptation awareness and measures and discuss and decide on a numbered of proposed actions. The city has many policies and disaster management plans in place although implementation and enforcement was often found lacking. The actions were mainly about infrastructure and ecosystems with few related to boosting and transforming agent capabilities and institutions. The action plans outlining the frequency and responsible institutions for tree planting and cleaning streams also lacked detail or identification of lead institutions, departments, or people. Although stakeholders highlighted that local knowledge was not sufficiently used to inform good planning and policies, the action plans did not include community representatives in decision-making rather only in the implementation of the proposed actions. Although when the group identified slum populations as especially vulnerable the focus of the assessment shifted but in action plans representatives of this group were not included in any decision making or planning processes.

1. Introduction

Impacts from climate change are intensely felt throughout India and will likely escalate in the future. Urban populations face several large challenges due to risks from flooding, heat-trapping, water shortages and air quality deterioration (Revi, 2008; Panda, 2011) and many of the poor are particularly vulnerable (Somanathan and Somanathan, 2009; Sett and Sahu, 2014). Seventeen percent of the Indian urban population live in slums (India Habitat III Report, 2016) in poor housing with unreliable access to drinking water and sanitation and by 2060 an additional 500 million will reside in urban centres (Sharma and Tomar, 2010). Targeted actions are necessary to reduce current vulnerability and address climate adaptation issues (Dubash et al., 2013; DoE, 2010). The *Pradhan Mantri Awas Yojana* (Housing For All by 2022) scheme launched in 2015 aims to construct 20 million housing units for the urban poor, one million of those in Rajasthan (India Habitat III Report, 2016). Such large-scale constructions provide opportunities to link climate change resilience with urban planning decisions (Sharma et al., 2013).

This paper examines the outcomes of a multi-stakeholder vulnerability assessment process in Kota City, Rajasthan that involved

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urban planners and representatives of government departments and slum populations. The interventions proposed by stakeholders are organized according to the three key resilience elements identified by Tyler and Moench (2012) and the identified barriers and facilitating factors placed in Moser and Ekstrom's (2010) spatial-temporal matrix. This enabled a deeper exploration of the types of interventions, the origins of the barriers and enabling factors and the implications these might have on implementation of the suggested adaptation measures.

2. Urban vulnerability and resilience

Vulnerability as related to climate change can be seen as the extent to which a natural or social system is susceptible to experiencing damage from climate change or its impacts. Vulnerability assessments are ways to evaluate the exposure and sensitivity of different areas, sectors and societal groups to climate change impacts, as well as the capacity of citizens and institutions to respond and adapt to these changes (Füssel and Klein, 2006). The IPCC has recommended undertaking vulnerability assessments and including stakeholders at relevant geographical scales to map, explore and better understand the major challenges related to climate change and how adaptive capacity can be strengthened (Parry et al., 2007). Many vulnerability assessments have been recently conducted to identify 'hot-spots' of vulnerable populations or sectors, inform the public of climate risks and ways to strengthen adaptive capacity, target funding strategies or increase understanding of the characteristics of socio-economic systems that underpin vulnerability (Tonmoy et al., 2014). Assessments should address and bridge complex relationships and lack of synchronisation between key actors and their responsibilities, policies, planning and implementation, and take account of and respect cultural and local traditions (André, 2013; Pahl-Wostl, 2009). In urban contexts, there is often little concrete data to guide actions in ways that address root problems (Hardoy and Pandiella, 2009). State level action plans on climate change (SAPCC) began to be released in India in 2009. Although vulnerability assessments are one of the basic requirements of the plans, many states based their assessments on state level data and information (Dhanapal and Panda, 2014), rather than on more exploratory and locally based assessments that target and include sensitive groups. Indicator-based assessments facilitate the comparison of geographical regions and assessments of changes over time but they have been also criticized for being unable to capture the complexity of climate change vulnerability (Hinkel, 2011; Adger, 2006) and are dependent on high data availability, resolution and accuracy. While indicator-based assessments are good options when starting to analyse vulnerability (Tonmoy et al., 2014), for greater detail and use in practical applications, other methods such as participatory assessments and finer scales are necessary to target sensitive groups and promote social learning (Yuen et al., 2013).

Nordgren et al. (2016) suggest that local governments have the resources and methods available to undertake vulnerability assessments and adaptations plans, but not the resources and organizational capacity for implementation, monitoring and evaluation of the plans. Much climate adaptation planning follows the traditional predict and prevent approach, although the unpredictability of climate change requires other approaches that include social learning and governance (Tyler and Moench, 2012). Vulnerability assessments that promote shared or collaborative knowledge production fostered through multi-stakeholder dialogues and forums have proven successful for collecting, discussing and contrasting the knowledge, perspective and capacity of involved stakeholders to deal with different types of issues (Janarayan et al., 2007; Jonsson et al., 2005). To deal with multiple perceptions and priorities, the processes benefit from a structured yet flexible design that can be modified according to local institutional strengths, capacities and identified needs (Alkan-Olsson et al., 2011; Jonsson & Wilk, 2014; Steyaert et al., 2007; Chu et al., 2016). Social learning can evolve from more inclusive approaches to urban climate adaptation planning. Inclusive approaches are important in addressing equity issues, exploring multiple framings of an issue and supporting collective actions (Chu et al., 2016; Yuen et al., 2013).

Many urban centres currently strive to enhance their resilience to meet the intensified challenges of climate-related impacts, and networks such as ICLEI, ACCCRN and Resilient Cities are continually gaining new members. Resilience can be defined as "…the ability to absorb disturbances, to be changed and then to re-organize and still have the same identity" (Sharma et al., 2013, p.13). Most approaches and frameworks that describe and promote resilience, point out the need for diversity, flexibility, adaptive governance and capacity of learning (Leichenko, 2011) and the importance of linking climate resilience strategies with other development policies and plans, so they might even be realised at lower cost (Hardoy and Pandiella, 2009). Although resilience often is treated as the reverse side of vulnerability, it is more closely related to adaptive capacity, one of the components of vulnerability along with exposure and sensitivity (Gallopin, 2006).

The Urban Climate Resilience Planning Framework (Tyler and Moench, 2012) points out three key elements that need to be strengthened to increase capacity to deal with climate change and its impacts: systems, including infrastructure- and ecosystems, agent capabilities and institutions. This approach proposes that resilience is high where "*robust and flexible systems* can be *accessed by high-capacity agents* and where that access is *enabled by supportive institutions*" (Tyler and Moench, 2012: 318). Although resilience could be applied on an aggregated city level, the suggested approach puts focus on vulnerable populations in locations that suffer from infrequent and irregular access to services and builds on shared learning dialogues, vulnerability assessments and sector studies (Sharma et al., 2013). A criticism of the resilience concept when used as a framework is that it supports people's maintenance of their current status (Friend and Moench, 2013) without recognition that many poor people need to improve their current state in terms of assets and security, rather than to merely bounce back to pre-disturbance levels. The authors argue that long-term changes must also be in focus in vulnerability assessments and resilience frameworks to empower the poor and vulnerable to access resources and assets to change their situations. This involves recognising the underlying drivers of poverty and inequality (Gaillard, 2010) and focussing on issues of people, politics and power (Bahadur and Tanner, 2014).

Resilience's premise of bouncing back when placed on the "contested social world" may ignore or disavow other social criticisms and realities related to equality, poverty or social justice (Friend and Moench, 2013). Despite its limitations, the same authors argue

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