

The shifting geographies of climate change justice

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The Shifting Geographies of Climate Justice: Mobile Vulnerabilities In and Across Indian Cities

Eric Chu¹ and Kavya Michael²

Abstract. This chapter takes the cases of Bangalore and Surat in India to examine how the reorganisation of labour, together with its associating economic networks and spatial infrastructure, is emblematic of the shifting interconnections between uncertain climate change risks and experiences of local economic transformations. Through documenting migrants' exposure to varying forms of vulnerability, the chapter illustrates the mobility of climate injustice across space via pathways of labour informality and environmental marginality. The chapter theorises the shifting geographies of climate injustice within and across the ill-defined boundaries of the 'urban' in the Global South. It concludes that first, spatially and temporally 'static' definitions of climate justice fail to account for the mobility of people and transfer of vulnerabilities across space. Second, climate justice theories must encompass priorities to transform economic structures underlying economic informality. Future research must therefore examine the multiple intersections of urban labour, identity politics, and economic marginalisation under climate change in the Global South.

Key messages.

- Spatially and temporally static definitions of climate justice fail to account for the mobility of people and transfer of vulnerabilities across space.
- Climate justice theories should encompass priorities to transform economic structures underlying socioeconomic informality in cities.
- Future research must examine the multiple intersections of labour and economic marginalisation under climate change in the Global South.

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Situating Climate Justice in the Global South

Scholars of climate change justice have explored the need to delineate global mitigation responsibilities and share adaptation resources (cf. Ciplet, Roberts, and Khan 2015; Caney 2014). At the local level, recent literature on climate justice has focused on diagnosing injustices or articulating normative ideals for how justice priorities can be operationalised into policies (Shi et al. 2016; Hughes 2013). In this chapter, we unpack the justice implications of urban climate change adaptation and resilience in development contexts. This literature especially notes the importance of including vulnerable actors in managing risks and adaptation benefits (Archer et al. 2014; Chu, Anguelovski, and Carmin 2016; Ziervogel et al. 2017), as well as assessing the social, economic, and political implications of particular adaptation interventions (Anguelovski et al. 2016). In the Global South, however, justice considerations are often complicated by the material frames of daily life, which are mostly cast through the prism of economic production and investment (Betsill and Bulkeley 2007; Boyce 2002). In this context, *economy* is by far the most important development paradigm driving climate actions. We see this in how climate adaptation or resilience is packaged as a constituent element of urban economic competitiveness (Vale 2014; Meerow, Newell, and Stults 2016; Harris, Chu, and Ziervogel 2017) and in how adaptation and risk management are used as tools for enabling gentrification (Anguelovski et al. 2018).

This chapter takes the cases of Bangalore and Surat in India to examine how the reorganisation of labour – together with its associating economic networks and spatial infrastructure – is emblematic of the shifting interconnections between uncertain climate change risks and experiences of local economic transformations. We draw on a mix-methods qualitative methodology (primarily semi-structured interviews, household surveys, and gender-differentiated focus groups) to evaluate how rural-urban migrants in India experience the compounding and trans-boundary impacts of climate change and contemporary economic transformations. In particular, the case studies from Bangalore and Surat highlight the *shifting* dynamics of climate injustice in cities of the Global South. The idea of *shifting* not only speaks to the mobile and constantly evolving nature of how risks and vulnerabilities are experienced in and across space, it also points to a need to renew our conceptual approach to identifying, delineating, and evaluating climate (in)justice in cities. Therefore, the mobility of risks points to how urban climate injustices are situated within intersecting forms of socioeconomic marginality beyond the immediate borders of the city *and* are simultaneously reconstructed in-situ due to the overlapping vulnerabilities posed by employment insecurity, housing precariousness, and emerging climate change risks.

Our chapter informs climate justice theories by documenting the shifting geographies of climate injustice within and across the ill-defined boundaries of the ‘urban’ in the Global South. In particular, the case studies highlight a clear connection between the urbanisation of economic production (cf. Brenner and Theodore 2002; Brenner 2004) and the reproduction of environmental vulnerability among the poor (Michael, Deshpande, and Ziervogel 2017; Walker 2012). We note that first, spatially and temporally ‘static’ definitions of climate

justice fail to account for the mobility of people and transfer of vulnerabilities across space. Second, climate justice theories should encompass priorities to transform economic structures underlying economic informality. We must therefore further examine the multiple intersections – or the double exposures (cf. Leichenko and O’Brien 2008) – of urban labour and economic marginalisation under climate change in the Global South.

Theories of Climate Justice In and Across Cities

Issues of climate change adaptation and resilience are inherently engrained within questions of equity, inclusion, and justice (cf. Pelling 2010; Parks and Roberts 2010; Beckman and Page 2008). In the context of cities in the Global South, one must balance the reality that many are seeking to embark on resource-intensive development pathways while simultaneously experiencing inadequate infrastructure to deal with uncertain climate change impacts. This inevitably yields questions about adaptation and resilience *for whom, through what mechanism, and to what end* (Meerow and Newell 2016; Shi et al. 2016; Sovacool, Linnér, and Goodsite 2015). Many existing studies focus on issues of social inclusion in climate adaptation planning and policy-making processes, which posit that adequate representation and participation of vulnerable communities will yield more equitable solutions (Chu, Anguelovski, and Carmin 2016; Chu, Schenk, and Patterson 2018). Simultaneously, some studies have begun to show how existing or pipeline climate adaptation or resilience-building actions are resulting in differential impacts on urban communities, such as displacing low-income groups, incentivising unaffordable or privatised public services, or prioritising economic investment opportunities over providing collective welfare needs (Anguelovski et al. 2016; Pearsall 2012; Anguelovski and Martínez Alier 2014). Though many of these studies are normative in nature, they do show that poor communities are differentially impacted, experience less adaptive capacity due to lower access to social, political, and economic capital, and are typically not the focus of wide-ranging urban climate change actions.

Despite an emerging scholarship on urban climate justice, these assessments tend to focus on the instruments, strategies, and actions required to rectify immediate inequalities rather than diagnose the structural factors contributing to social, economic, and political marginality at-large (Parks and Roberts 2010; Schlosberg 2012; Bulkeley et al. 2013). To achieve the latter, we must expand the scope of our interrogations to include intersectional injustices – i.e. in terms of ethnicity, caste, gender, etc. (e.g. Terry 2009; MacGregor 2010; Arora-Jonsson 2011) – as well as to spatialise our theories to encompass extra-urban and trans-boundary contributors to urban climate injustice (Shi et al. 2016; Fisher 2015). In this chapter, we critically evaluate the issue of migration as an entry point to analysing this spatial ‘turn’ to urban climate justice. Migration patterns are attributed to a complex interplay of economic, social, political, and demographic factors, though disentangling the role of climate change as a particular driver is difficult (IPCC 2014; Scheffran, Marmer, and Sow 2012; Faist and Schade 2013; Hunter, Luna, and Norton 2015). Researchers in India have also identified gaps in understanding how migration affects wellbeing at the sources and destinations of migrants (Deshingkar 2004; Chandrasekhar and Sharma 2014). Earlier

assessments of migration from the perspective of economic geography saw it as a movement of people from less to well economically developed areas through push factors – including those attributed to poverty and deprivation – and pull factors such as better wages (Deshingkar 2004). However, more recently, scholars have documented forms of involuntary migration (or migration for survival). As such, Deshingkar (2004) argues that we should not only examine productivity and labour demand as the sole determinants of migration patterns. In fact, migration is also structured around people's access to resources, the environment, intra-household relations, and wider social divisions.

For the rural poor, migration is not only an integral livelihood strategy, it also allows for insights into documenting the rural-urban continuum (Satterthwaite and Tacoli 2002). Climate change and its associating environmental impacts often dictate migration decisions only after being filtered through social, political, and economic conditions on ground (Michael, Deshpande, and Ziervogel 2017). In India, climatic factors such as increased drought frequency and changing temperature and rainfall patterns significantly drive temporary forms of migration, although they exert lesser influence on permanent migration (Kavi Kumar and Viswanathan 2013). Furthermore, 60% of the Indian population depends on agriculture, so large landholders with strong social capital and large asset bases are able to resist climate change induced stresses while small-scale landowners, marginal farmers, and landless labourers are forced to migrate (Viswanathan and Kavi Kumar 2015). Such groups of marginalised, landless, and unskilled migrants – often with poor access to social networks and political agency – travel to cities and end up in precarious or insecure jobs and congregate in informal squatter settlements.

Reminiscent of the recent history of cities across the Global South, urbanisation patterns in India have largely been forged by the neoliberal practices of market-oriented governance – and subsequently enabled through privatisation and urban entrepreneurialism (cf. Smith 2002; Harvey 1989; Miraftab 2004) – that resulted in benefits for a particular socioeconomic class and yielded uneven power relations across society (Whitehead 2013; Vakulabharanam and Motiram 2012; Corbridge, Harriss, and Jeffrey 2013). Since liberalisation reforms were implemented in 1991, the Indian state has rapidly transformed from being a land regulator to becoming an active agent for private interests (Shrivastava and Kothari 2012; Chibber 2003). Many from the rural areas began moving into cities in search of formal employment opportunities after experiencing land expropriation and falling welfare (Viswanathan and Kavi Kumar 2015). However, many found themselves in mushrooming slums. This high concentration of informality represents one of the starkest manifestations of urban poverty and inequality – trends that are exacerbated due to the compounding effects of climate change on social precariousness and informality (Michael, Deshpande, and Ziervogel 2017).

Recent research on cities in the Global South increasingly focuses on urban processes that span urban-rural continuums rather than the spatial confines of urban spaces and structures (Roy 2016; Swyngedouw and Heynen 2003; Heynen 2013). In India, Gururani and Dasgupta (2018) argue that the rural and urban are in fact materially and symbolically co-

produced, while the contested politics of urbanisation is shaped by processes of urban-to-rural migration. In particular, decreasing rates of social provisioning by the state and declining access to rural commons have created an increased appetite for migration to urban spaces (Rao and Vakulabharanam 2018). Migration therefore entails giving up land – whether voluntarily or involuntarily – as well as long-held employment practices, livelihood strategies, and kinship and social relations. As rates of rural-urban migration have increased since liberalisation in 1991, conflicts around access to real estate, land, and infrastructure have intensified due to highly unequal opportunities shaping socio-political inclusion and exclusion (Corbridge, Harriss, and Jeffrey 2013). Rao and Vakulabharanam (2018) note that India has entered into a migration crisis, which is characterised by three overlapping social crises: an agrarian crisis, employment crisis, and a crisis of social reproduction. Due to a drastic reduction of public investment in agriculture, decreased state support for small and marginal farmers (with both male and female heads of households), and the consequent loss of livelihood opportunities for small farmers and wage labourers (Vakulabharanam and Motiram 2012), the reordering of productive and reproductive labour across space has signified a deep transformation in Indian society (Rao and Vakulabharanam 2018). The agrarian crisis exacerbated rural poverty levels and pushed a large number of rural families to seek employment elsewhere (Shrivastava and Kothari 2012). However, due to the lack of high quality and regular formal jobs and the mismatch of skills requirements in the formal sector, most migrant workers find refuge in the informal sector.

The economic vulnerability of informal sector workers in Indian cities is compounded by heightened exposures to climate change and disaster risks (Mukhopadhyay and Revi 2012). Climate hazards can cause loss of land and livelihoods, putting pressure on the city's existing urban infrastructure (Michael, Deshpande, and Ziervogel 2017; Revi 2008). In the Indian context, the informal economy is largely constituted of the excluded masses that subsidise and feed the formal economy by providing various cheap inputs in the form of labour or commodities, all the while being periodically dispossessed by the elite. For example, male urban informal workers often find it impossible to provide basic needs and care work, ultimately leading to increased reliance on unpaid labour that is performed by women (Rao and Vakulabharanam 2018). The growing importance of unpaid female labour entrenches traditional gender norms and supports the survival of male migrants in hostile urban conditions by allocating care activities and provisioning of basic needs like cooking, cleaning, and fetching water to women (Folbre 2002; Rao 2017; Razavi 2007). From a climate justice point of view, groups that are marginalised – such as women in the informal economy – are likely to have fewer opportunities to influence policy-making, so decisions made by governments are unlikely to benefit them (Chu, Anguelovski, and Carmin 2016). As a result, the challenges of climate justice in Indian cities are embedded within the structural economic, political, and social disenfranchisements experienced by the poor over the past several decades of liberal reform.

Under climate change, projected ecological risks and vulnerabilities will inevitably be embodied by labourers in their daily interactions with the variegated hazards of economic production. This may include their double-exposures to climate impacts and local economic

transformations (Leichenko and O'Brien 2008) to smaller-scale risks such as working outdoors in extreme temperatures, living in precarious housing conditions, and being prevented from accessing adequate education and capacity-building programmes (Revi 2008; Michael, Deshpande, and Ziervogel 2017). In India and across the Global South, forms of urban marginalisation are the outcomes of historic development pathways that have yielded highly unequal processes and patterns of allocating resources and access to spaces within the city (Fernandes 2004; Watson 2009). Social divisions and hierarchies based on caste or gender make exploitation even more stark (cf. Desai and Sanyal 2012). As these patterns of social exclusion are replicated across rural and urban spaces (Bhagat 2017), an analysis of urban labourers and their experience of political, social, and environmental marginality must also be understood within the larger context of the rural-urban continuum (Rao and Vakulabharanam 2018).

As articulated in this section, there is a significant gap in the literature on understanding how the *spatial* process of migration and accelerating urbanisation affects existing inequities in resource distribution and access, as well as shapes the vulnerability of migrants to climate change. In this chapter, we illustrate these contending dynamics through evaluating the experiences of the cities of Bangalore and Surat. The Bangalore case highlights how vulnerability is transferred in a circular manner between urban and rural spaces while the Surat case illustrates how trans-boundary ideas are enacted across the urban space. Both unpack the heightened climate vulnerabilities for migrants who experience little to no citizenship rights and remain excluded from the unfolding benefits of neoliberal urbanisation.

Bangalore: A Case of Rural-Urban Disenfranchisement

The city of Bangalore is located in the south-eastern dry zone of Karnataka and is characterised by a semi-arid climate (Basu and Bazaz 2016). Bangalore has experienced significant changes in climatic conditions including increasing temperature, significant decline in annual precipitation, and erratic rainfall patterns. These climatic conditions intersect with the existing exclusionary development pattern in Bangalore and often define vulnerabilities for the lower echelons of society (Michael, Deshpande, and Ziervogel 2017). Bangalore is one of India's fastest growing metro cities and is an ideal representation of the pattern of contemporary urbanisation in India. Bangalore was known as a comfortable middle class town dominated by secure union jobs and manufacturing firms till the early 1990s (Goldman 2011). The city was noted for its distinctive local economy that catered to poor and middle-income groups (Benjamin 2000). However, following liberalisation, Bangalore experienced an influx of transnational corporations that paved way for the city's transformation into a 'world-class' city, with infrastructure and public services catering for the emerging information communication technology (ICT) industry (Basu and Bazaz 2016; Goldman 2011). This development was also accompanied by accelerating patterns of socio-economic inequality, mass displacement and dispossession, the proliferation of slum settlements, increased community and ethnic violence and tensions, and epidemic public

health crises due to severe water supply and sewage problems particularly in poor and working class neighbourhoods (Goldman 2011).

Like many cities across the Global South, Bangalore has pursued the idea of building a ‘world-class city’, which has led to mass displacement of the urban informal settlement dwellers. The allocation of land and funds by the state or debt-financed para-statal – who are accountable only to their international donor organizations – are highly discriminatory and largely favour transnational corporations (Benjamin 2000). The mega city projects executed under key schemes such as the Bangalore–Mysore Infrastructure Corridor (BMIC), the IT corridor, and the Bangalore International Airport and its surrounding development area (BIAL) all clearly show how para-statal agencies serve as active agents of land speculation (Goldman 2011). These large-scale projects attract both highly skilled as well as numerous distressed migrants, who often find refuge in burgeoning informal settlements in and around the city where they are exposed to insecure and fragile livelihoods and living conditions (Michael, Deshpande, and Ziervogel 2017).

Bangalore attracts both migrants from within Karnataka (i.e. intrastate migrants) as well as those from Uttar Pradesh, Bihar, and West Bengal. To comprehend the shifting nature of vulnerabilities experienced by these migrants, it is critical to assess the socio-economic, political, and climatic factors that triggered their decision to migrate. Based on our field research findings, while interstate migrants identified severe socio-economic marginalisation in their homelands as the primary driver of migration, those from West Bengal also attributed their decision to flash floods that occurred in 2000. Intra-state migrants similarly noted the impacts of looming drought and agrarian crises in their home districts – notably Raichur, Gulbarga, Yadgiri, Bijapur, Bellary, Haveri, and Koppala – as primary drivers of migration to Bangalore in search of alternate livelihood options. Many of these rural-urban migrants are landless agricultural labourers or small/marginal farmers belonging to socio-economically disadvantaged groups, who were further disadvantaged due to falling land productivity, severe indebtedness, and the lack of support from recent agrarian reforms.

As noted by Breman (2013), intra-state migrants fit aptly into the category of footloose or nomadic labour who circulate between the village and the city. These workers are often unable to find viable livelihood options in agriculture while their temporary status prevents them from attaining a foothold in the city (Vakulabharanam and Motiram 2012). This creates circular forms of migration because they are displaced from the rural-urban continuum. Inter-state migrants, however, often do not have any fallback options in their villages and so live a disconnected and isolated life in the city. The linguistic gap adds an additional layer of vulnerability for interstate migrants as it leads to their total alienation from public services, social networks, and political voice (Michael, Deshpande, and Ziervogel 2017). Interstate migrants typically engage in waste picking and informal construction, though the municipal government does not fully recognise many of them and the stigma attached to their occupation often results in detrimental impacts on their sense of dignity. Some level of labour exploitation is common, as Vakulabharanam and Motiram (2012) note how there tends to be a deliberate strategy of employing a voiceless and pliable labour force.

Migrants also are unable to avail subsidies from the public distribution system since ration cards are invalid if not procured locally in Bangalore. The lack of citizenship rights means that migrants are under a constant threat of eviction, where their illegal status yields a pervasive sense of fear and insecurity. In sum, these examples highlight how in Bangalore, migrants' previous experiences with the trauma of land expropriation are then compounded with the distress of marginal economic, political, and social life in the city.

In assessing the environmental vulnerability of migrants in Bangalore, it is clear that they experience inadequate access to basic services and infrastructure (Basu and Bazaz 2016). Migrants usually settle in newer parts of the city where informal settlements have existed for less than ten years. Such areas tend to be undeclared settlements and therefore do not receive any government support. Housing conditions are often poor, where dwellings are typically made of unsteady and temporary metal or tarpaulin sheets and unbaked bricks. Since many of these settlements lack adequate draining or sewage systems despite their low elevation, many are severely flooded during heavy rains. In the face of climate change, these settlements are exposed to additional flooding, heat island effects, and periods of water scarcity (Revi 2008), which not only causes detrimental effects on public health but also prevents migrants from earning an adequate daily wage. Furthermore, they have little or no negotiating power in the city and are ignored by many government and civil society programmes. In this case, climate-related risks are experienced by vulnerable migrants in ways that intersect with multiple forms of socioeconomic marginalisation and livelihood insecurity that span across their rural origins and urban destinations.

Surat: A Case of Exclusion and Displacement

With a population of 4.5 million, Surat is the eighth largest city in India. The city is situated on the Tapi River in the state of Gujarat, near to the point where it meets the Arabian Sea. Surat has served as a major trading hub since the 16th century, when it emerged as a notable shipping and sea-trading node. Since then, the city has retained its identity as a major commercial hub, and now is home to large concentrations of diamond cutting and polishing, textiles, and petrochemical industries. As India's economy began to liberalise starting in the early 1990s, Surat experienced a major population boom on account of its economic centrality, with some estimates showing 40-50% population growth per decade over the past 30 years (ACCCRN 2011). With this growth, Surat has transformed itself from a medium-sized regional trading town to a major global and national hub for diamonds and textiles. The municipal government of Surat has recognised the city's economic strengths, and has facilitated investment-friendly policies to attract small- and medium-sized enterprises (SMEs) as well as larger petrochemical and information technology firms.

As with Bangalore, the growth of Surat's economic base over the past three decades has led to high levels of migration. The city attracts labourers from eastern India primarily from rural areas in Odisha, Bihar, and Jharkhand, who flock to the city in search of opportunities in Surat's many diamond and textile factories. In response, the Surat municipal government (the Surat Municipal Corporation or SMC) has partnered with the Surat Urban

Development Authority (SUDA) to respond to this growing housing need. Although additional housing units have been built in the northern and western zones of the city, this has not been able to meet the growing demand, particularly since many of the migrants are low-wage earners and so are not able to afford newly built units. As a result – and as common to many of India’s large cities – low-income migrants start to congregate in slum settlements. For Surat, such areas include the Tapi River flood zones and on marginal lands in the city’s periphery, all of which are environmentally precarious and lack adequate access to public services and infrastructure.

In addition to promoting investment and industrial development, a unique aspect of Surat’s development over the past decade has been a focus on environmental management. Surat has experienced a number of disasters, including a plague epidemic in 1994 that led to one of India’s first comprehensive urban sanitation and public health programmes. Another is a major flood disaster in 2006, which again caused a major public health crisis due to the way stagnant water promotes vector-borne diseases (including leptospirosis and Dengue Fever) and gastrointestinal maladies such as cholera. The 2006 floods also caused major infrastructural damage to the city centre (Bhat et al. 2013). The twin disasters not only led Surat to focus on improving its public health standards and policies – such as through developing a vector-borne diseases surveillance unit within the SMC – it also catalysed initial ideas around the need for a more comprehensive disaster risk management and resilience-building approach for the city (Anguelovski, Chu, and Carmin 2014). This latter point was seen as particularly important due to the city’s interest in fostering an entrepreneurial spirit among its residents.

In 2009, the Rockefeller Foundation identified Surat as a pilot city for their new Asian Cities Climate Change Resilience Network (ACCCRN) programme. The Rockefeller Foundation had recently identified tackling climate change as an institutional priority, and looked into opportunities for building climate resilience in small- and medium-sized urban centres across South and Southeast Asia (Moench, Tyler, and Lage 2011). As one of three ACCCRN pilot cities in India, Surat was selected because of its high governance capacity, high public awareness of emerging environmental risks, and high levels of private sector interest in building resilience (Sharma, Singh, and Singh 2014; Chu 2016a; Brown, Dayal, and Rumbaitis Del Rio 2012). In particular, the Rockefeller Foundation noted Surat’s prior experience in large-scale public projects to address public health crises and natural disasters, and therefore saw the city as a unique case to pilot more comprehensive risk and vulnerability assessments and more collaborative, cross-sectoral planning and policy-making methodologies.

Notably, the primary focus of ACCCRN’s interventions in Surat was not on the justice or equity dimensions of climate change resilience action. Between 2010 and 2014, most the resources offered through the ACCCRN programme were channelled into building local government capacities around assessing climate change risks and vulnerabilities, identifying relevant public sector institutional partnerships, and designing specific upgrade projects to improve the adaptive capacity of critical infrastructure sites (Chu 2016a).

Examples of interventions include comprehensive flood risk assessments across the city, installing water gauges along the Tapi River to create a unified early warning system, and strengthening flood protection systems (ACCCRN 2011; Chu 2016b). Beyond the initial priorities around building capacity for public health and flood risk management, the city also began to envision more inclusive decision-making pathways to ensure adequate representation and voice in evaluating and prioritising resilience projects. These include designing more climate-sensitive housing units with natural sources of cooling, building a vulnerable peoples database to inform emergency services in the event of disasters, and embarking on different ‘shared-learning dialogue’ workshops to gather citizen ideas, priorities, and interests during the climate change planning process (ISET 2010; Chu 2016b). As climate change discourses were relatively new for both the local government and residents, the ACCCRN programme focused on inclusiveness by increasing public awareness of climate change risks, impacts, and priorities for building resilience (Chu, Anguelovski, and Carmin 2016). Strategically, ACCCRN interventions focused on mainstreaming emerging climate change priorities into pre-existing development strategies around public health, economic competitiveness, and infrastructure upgrading.

Financial support from the Rockefeller Foundation concluded in 2014, so the city established the Surat Climate Change Trust (SCCT) to formalise many of the earlier pilot interventions. As the SCCT was registered as a philanthropic trust, it could pool and channel financial resources in a more efficient manner compared to the municipal authority (Cook and Chu 2018). Many of the former members of the city advisory committee for ACCCRN were also brought on as trustees for the SCCT. This included representatives from the Surat Municipal Corporation (SMC), Surat Urban Development Authority (SUDA), as well as the Southern Gujarat Chamber of Commerce and Industry (SGCCI). The leadership role played by the Chamber of Commerce not only reflects the priority of integrating environmental and economic resilience across the city, but it also reflects the historical role that industrial and trading classes have played in directing Surat’s development trajectory. The SCCT subsequently built upon previous ACCCRN-supported interventions around public health resilience, disaster risk early warning systems, and raising awareness of climate change risks and vulnerabilities among local government actors.

From a climate justice point of view, Surat’s experience highlights concerted efforts to enhance procedural equity and inclusiveness in the initial planning and piloting phases (Chu, Anguelovski, and Carmin 2016). Notably, the *Surat City Resilience Strategy* (2011) highlighted the importance of achieving social cohesion through the resilience-building process (ACCCRN 2011). Embedded in this is the assumption that collective actions would increase adaptive capacity in times of disasters, such as during the 1994 plague and 2006 flood events. The focus on social cohesion is also rooted in the Surat’s socio-cultural identity, where entrepreneurial classes often shaped around kinship, caste, ethnic, and religious communities have historically contributed to the economic development of the city (Chu 2016a). The Rockefeller Foundation saw an opportunity to harness existing ideals around social cohesiveness and economic innovation to further local initiatives around improving public health, urban infrastructure, and disaster warning under climate change.

Although Surat's experience is often hailed as a success in urban resilience action, the structured planning and participatory process has been critiqued. In particular, from a procedural equity standpoint, the selection of participants in the various adaptation and resilience projects have been limited to expert decision-makers and notable city leaders, such as those representing major economic bodies (Harris, Chu, and Ziervogel 2017). This selection process made sense at the time because general awareness of climate change was low. However, it soon became clear that the process lacked broad representation from the different affected communities. Second, as the planning process lacked a voice from poor and vulnerable citizens, the subsequent interventions also neglected to account for the interests of the marginalised. For example, the various infrastructure upgrade projects in response to emerging climate risks – including fortifying river embankments and upgrading pipelines – were built in ways that displaced communities living in the floodplains, which housed many of the city's migrant labour population (Anguelovski et al. 2016). From a public health perspective, in contrast, many of the disease monitoring systems supported by the SCCT did explicitly target lower-income neighbourhoods that disproportionately suffered from Dengue, leptospirosis, and gastro-intestinal disease outbreaks during floods. These examples highlight an uneven treatment of climate inequalities when poor communities are not involved in the decision-making process from the outset.

For those who were displaced by Surat's climate change infrastructure, the results point to a 'double exposure' to climate vulnerability and economic precariousness (cf. Leichenko and O'Brien 2008). As migrants arrived in Surat in search of jobs in the city's flourishing diamond and textile factories, their lack of economic security often meant that they congregated on marginal lands. In Surat, this often meant low-lying floodplain zones that were vulnerable to flooding and inundation, which are projected to worsen under climate change (ACCCRN 2011). At the same time, as shown through the Rockefeller Foundations engagement between 2009 and 2014, the city recognised the imminent risks of climate change, and therefore devised planning strategies to address them with the help of notable and economically powerful actors. This eventually led to a policy discourse where climate change was seen as an opportunity to strengthen and render the city's economic base more competitive through upgrading infrastructure, improving environmental quality, and enabling wider economic competitiveness. Though many of the ACCCRN-supported interventions pay some attention to the unequal distribution of climate change risks across the urban landscape, the eventual infrastructural outcomes shifted climate risks from economically valuable industries to economically marginalised slums.

Theorising the Shifting Geographies of Urban Climate Justice

The case studies from Bangalore and Surat highlight the *shifting* dynamics of climate injustice in cities of the Global South. This idea speaks to the mobile, trans-boundary, and constantly evolving nature of how risks and vulnerabilities are experienced within and across space. It also points to a need to renew our conceptual approach to identifying, delineating, and evaluating climate injustices in cities. These arguments are exemplified through our two case studies, where we see a transfer of socio-economic precariousness from rural to urban

spaces due to the introduction of neoliberal policies and the transformation of economic production in India over the recent decades. The mobility of risk, therefore, points to how urban climate injustices are tied to intersecting forms socioeconomic marginality beyond the immediate borders of the city *and* are simultaneously reconstructed in-situ due to the overlapping vulnerabilities posed by employment insecurity, housing precariousness, and emerging climate change risks.

Our discussion of the *shifting* geographies of climate justice points to a need to renew our methodological approach to unpacking the sources, experiences, and consequences of climate injustice in cities. Our brief investigations into Bangalore and Surat – both cities with extraordinarily high population growth rates over the past several decade – highlight the need to examine climate justice through the pathways and flows of human and capital movement across space. In India and across much of the Global South, cities have been nodes of transformation amidst a wider network of economic, social, and political change. Bangalore and Surat have experienced the liberalisation of its economic base since the early 1990s as well as an influx of speculative land management policies – often advocated by firms and policies beyond the city itself – which have resulted in mostly-unregulated spaces of extreme inequality. When combined with emerging understandings on the multi-scalar and trans-boundary nature of climate change risks (cf. Bulkeley and Betsill 2005; Bulkeley, Castán Broto, and Edwards 2015; Hughes, Chu, and Mason 2018), theories of climate justice must also interrogated the structural changes experienced by Indian cities over the past decades. To conclude this chapter, we offer several insights on theorising climate justice through this lens.

First, at a descriptive level, both case studies highlight how climate change actions target specific spaces for vulnerability reduction, adaptation, and resilience building (cf. Shi et al. 2016). The example from Bangalore highlights how climate vulnerabilities are mobile for poor migrants across rural and urban areas, while the case from Surat illustrates how trans-boundary ideas of adaptation and resilience are selectively enacted across economically valuable urban spaces. Such spaces are delineated based on rhetoric and ideals that are external to the space itself. In India, this rhetoric includes opportunities for increasing economic competitiveness, enhancing capital speculative potential, and improving environmental quality for middle class consumers. These political economic ideals are now further couched within the emerging climate change priorities, and offer a utopian vision of economic growth, environmental sustainability, and human wellbeing. However, as both case studies show, this process simultaneously exacerbates vulnerabilities for migrants who experience little to no citizenship rights. Those who were marginal or invisible to the benefits of urban development in past therefore continue to be marginalised and invisibilised in the implementation of climate change actions in cities.

Second, a geographical approach to theorising climate justice calls for a consideration of how cities – particularly marginalised and vulnerable residents – are ‘doubly exposed’ to environmental changes and socioeconomic transformations of modern society (Leichenko and O’Brien 2008; Parks and Roberts 2006). Migrant labourers are particularly at the whims of economic transformation (i.e. a heightened precariousness of the poor due to

entrenched economic insecurity and informality) and climate change impacts. An analysis into the unjust distribution of infrastructure or the exclusion of vulnerable populations from decision-making must be tied to larger issues of urban entrepreneurialism, the revanchist city, rural land reform, a diminishing social welfare system, and the gradual deconstruction of state authorities in modern India. This therefore relates to the shifting interconnections between uncertain climate change risks and experiences of local economic transformations, and speaks to how climate justice scholarship can be better theorised against more foundational concepts in urban and environmental justice.

Finally, our focus on trans-boundary migrants as those experiencing heightened forms of climate and socioeconomic injustices highlights how, in reality, vulnerabilities are mobile across space. This requires a more nuanced understanding of the ‘urban’ whereby the politics, processes, actors, and resources associated with climate change also span across space (cf. Hughes, Chu, and Mason 2018). Movement is sometimes forced (i.e. displacement) but other times voluntary. The case studies from Bangalore and Surat illustrate that migration outcomes are largely determined by complex social processes, power dynamics, identity politics, and the reorganisation of labour across gender lines. Addressing climate change vulnerabilities on a city scale thus calls for due recognition and participation of the expanding unskilled migrant groups in cities, who remain spatially disengaged from broader urban systems and remain excluded from mainstream urban opportunities. As such, theories of climate justice are not only about the actors and the sites of inequality and marginality, but it is also about the flows, exchanges, and processes of reconstituting risks and vulnerabilities across space.

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