Climate Justice in Action

A framework for equitable climate action plans in cities

Tikender Panwar

Friedrich Ebert Stiftung

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Foreword

According to the Global Climate Risk Index 2025, India is the world's sixth most affected country by climate change. In the past few years, Indian cities have experienced increasing incidents of climate-related weather events like urban floods, rain bombs and heat island effects. On the other hand, the Climate Change Performance Index 2025 has ranked India at tenth place, reflecting the country's improving response to climate challenges. This is due primarily to domestic policies like the National Action Plan for Climate Change and State Action Plans for Climate Change, formulated as part of India's Nationally Determined Contributions under the Paris Agreement. While these plans have a strong focus on building resilience and mitigation strategies, they have done relatively little to build adaptation strategies.

Climate action plans, specifically at the city level, are one way to achieve adaptation goals. However, city action plans tend to remain generic in their recommendations, with negligible focus on groups that are more vulnerable and exposed to climate exigencies. There are several socio-economic challenges, complex power dynamics and societal hierarchies that determine the extent to which communities, societies and cities become resilient to climate change.

Under its social-ecological transformation work line, the FES India Office is developing knowledge and networks on sustainable urbanization, with environmental sustainability, economic stability and equity at their core. With this paper, FES India hopes to identify and propose recommendations towards a climate-justice-based approach for equitable and inclusive urban climate action. Such an approach recognizes and addresses the entanglements of political, social, economic and environmental issues with climate crises. It aims to ensure gender justice and intergenerational justice; safeguard the interests of workers; respect planetary boundaries and traditional knowledge; and build on resilience and adaptation for communities, all in a transparent, participatory and collaborative manner.

FES would like to thank the author, Tikender Panwar, for his in-depth research, expertise and value-based assessment of climate action plans from the perspective of equity and equality. We hope this paper will contribute towards a narrative of change for sustainable and equitable urbanization.

Christoph P. Mohr and Mandvi Kulshreshtha
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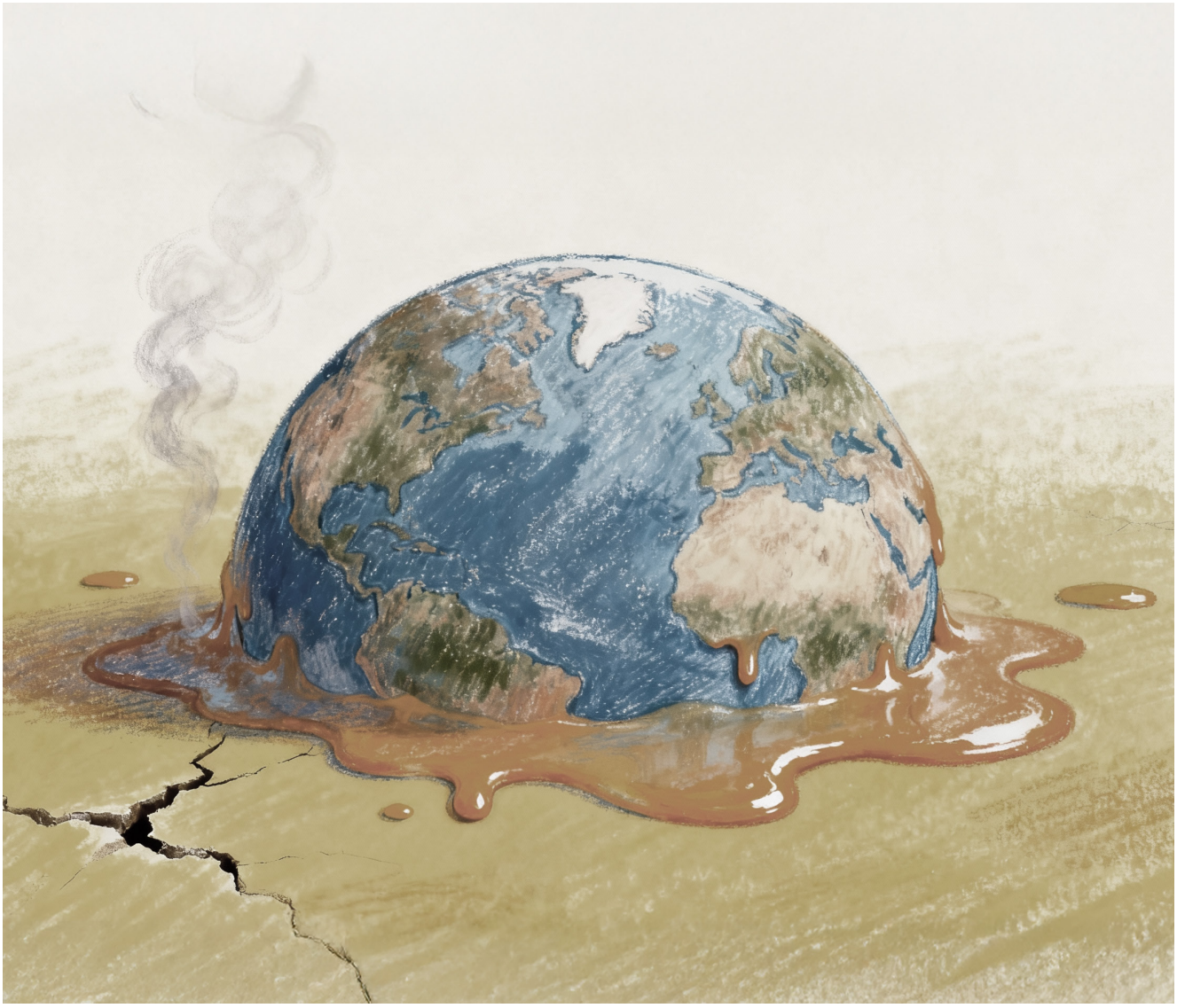
Chapter 1. Module introduction

1.1 Purpose of this module

This module aims to address the intertwined challenges of rising inequality and the growing impacts of climate change in cities. As urban areas experience increasingly severe climate-related events, vulnerable populations are disproportionately affected due to inadequate housing, healthcare and infrastructure. This module explores how existing political and infrastructural barriers often prevent collaboration between public authorities and community-based groups, hindering efforts to reduce urban inequalities. It highlights the importance of integrating climate policies with the "right to the city" agenda, promoting democratic, community-driven approaches that both tackle social inequality and prevent ecological breakdown. By fostering equitable and inclusive urban climate action, this module seeks to empower cities to build resilience and create just, sustainable futures for all their residents.

1.2 Module objectives

- To understand the principles of climate justice and their application to urban planning.
- To develop skills that engage marginalized communities in climate change action.
- To create actionable and equitable climate action plans for cities, prioritizing vulnerable populations.



Chapter 2. Introduction to climate justice in urban settings

Today, cities worldwide are grappling with two major challenges: rising inequality and the growing impacts of climate change. As cities face increasingly frequent and severe climate-related events, such as heatwaves, floods, air pollution and water shortage, vulnerable populations bear the brunt of their impact. These groups often lack access to adequate housing, healthcare and infrastructure, leaving them more exposed to environmental hazards and less able to recover from climate shocks. Meanwhile, the political institutions prioritizing these challenges often operate in isolation from each other. Both infrastructural and political barriers often prevent public authorities from working with community-based groups and movements to take immediate action to reduce urban inequalities, particularly housing and livelihood inequalities. It is in this context that this module proposes that the best way to prevent ecological breakdown is to democratically pursue climate policies that reduce social inequality. Effective and successful urban climate politics converge with the already-thriving "right to the city" agenda.

2.1 Defining climate justice

At its core, climate justice highlights the unequal ways in which climate change affects different social groups, with a particular concern for communities already pushed to the margins by economic, social and political structures. It demands that climate responses in cities do more than mitigate carbon emissions or build infrastructure—they must also ensure that the needs of vulnerable groups are met fairly, that these groups gain access to resources, and that their voices influence adaptation strategies. This perspective also insists on addressing the historical roots of exclusion and on building strategies of resilience that extend across all sections of the urban population (Schlosberg and Collins, 2014; Roberts and Pelling, 2019).

Urban climate justice literature has emphasized these themes consistently. Scholars note that unequal participation in decision-making, weak recognition of vulnerable groups, and the skewed distribution of benefits all contribute to the deepening of existing inequalities in cities (Wagle and Philip, 2022; Bulkeley and others, 2013). In response, the literature suggests three key interventions: first, that decision-making forums must represent all affected communities at appropriate scales; second, that diverse worldviews and experiences must be respected and included; and third, that climate policies must seek to address and redress material inequalities, rather than reproduce them (Young, 2011; Fraser, 2010).

Building on this body of work, scholars have converged on a three-pillared conception of climate justice. The first pillar is distributive justice, which concerns the fair distribution of the costs and benefits of adaptation measures, and insists that vulnerable groups should not bear a disproportionate burden. This draws on long-standing debates in political philosophy about fairness (Rawls, 1971) and has been adopted in recent urban research that indicates the limited adaptive capacities of marginalized populations (Zahnow and others, 2025). The second pillar is procedural justice, which refers to the fairness of decision-making processes and emphasizes participation, negotiation and deliberation as vital mechanisms for ensuring inclusion (Adger, 2006; Schlosberg, 2001). Finally, recognitional justice highlights the need to acknowledge differences between social, cultural and political identities and to rectify historically entrenched patterns of inequality (Miller, 2020; Van den Berg and Keenan, 2019).

Taken together, these three elements suggest that climate justice is multidimensional: it encompasses equitable outcomes and inclusive processes and recognizes social diversity. Yet, in practice, urban climate planning often falls short of these ideals. Many city strategies remain technocratic, focusing on infrastructure or carbon reduction, while neglecting efforts to systematically include marginalized groups. This gap underlines the need for climate policy that foregrounds justice not as an add-on but as a central concern (Bulkeley and others, 2014; Chu and Michael, 2019).

2.2 Historical context of climate injustice/inequality

The roots of climate injustice and inequality in urban settings are deeply intertwined with the historical processes of industrialization, colonization, economic exploitation and socio-political marginalization. Over time, these factors have affected low-income and marginalized communities disproportionately, making them more vulnerable to climate change impacts. Understanding this historical context is essential to addressing climate injustice and designing equitable solutions.

2.2.1 Industrialization and environmental degradation

The industrial revolution of the eighteenth and nineteenth centuries marked the beginning of large-scale environmental degradation, primarily in urban areas. Factories and industries concentrated in cities, mostly in Europe and North America, relied on fossil fuels, leading to a dramatic increase in greenhouse gas emissions and air pollution. The rapid urbanization that accompanied industrialization created densely populated areas where environmental hazards, such as polluted air and water, were concentrated in poor, working-class neighbourhoods.

Urban planning during this era was often discriminatory, with wealthier populations living in the cleaner, more desirable parts of a city while poorer communities were relegated to industrial zones, where pollution and health hazards were most severe. This pattern laid the groundwork for environmental inequality, whereby marginalized communities were exposed to greater environmental risks while wealthier residents enjoyed better living conditions.

2.2.2 Urbanization and socio-economic discrimination

As urbanization progressed in the twentieth century, many countries adopted unfair policies that adversely impacted their marginalized communities even further, instead of supporting them to protect themselves from and adapt to climate change. For example, in the United States of America, policies like redlining and segregation entrenched environmental and climate inequalities in urban areas. Redlining was a practice whereby financial institutions and governments systematically denied loans and investments to predominantly Black and immigrant neighbourhoods. Redlined neighbourhoods were often located near industrial facilities, highways and waste disposal sites, exposing residents to pollution, toxic waste and other environmental hazards. These areas lacked green spaces, public transport and other amenities that could mitigate climate impacts.

Segregation policies in other parts of the world, including apartheid in South Africa, had similar effects, concentrating marginalized communities in areas with poor infrastructure and limited access to basic services. In these settings, climate risks compounded existing inequalities, as vulnerable populations were less able to adapt to or recover from environmental shocks.

2.2.3 Neocolonialism and global climate inequality

Globally, the unequal distribution of climate change impacts between the Global North and the Global South is a legacy of colonialism and imperialism. In many postcolonial cities, climate injustice is stark. Colonial exploitation depleted natural resources, established extractive industries, and entrenched patterns of dispossession, leaving behind environmental degradation that disproportionately affects poor and marginalized urban populations today.

These inequalities are not only historical but continually reinforced by neocolonial relations in the present. Neocolonialism, in this context, refers to the ongoing dominance of powerful states, international financial institutions and multinational corporations in shaping the development trajectories of postcolonial societies, often under the guise of globalization, aid or sustainable development. In the sphere of climate governance, this manifests in the imposition of carbon markets, conditional climate finance and adaptation frameworks that reflect the priorities of the Global North more than the needs of vulnerable communities in the Global South (Okereke, 2010; Bond, 2012).

Urban planning, too, is increasingly entangled in such neocolonial strategies. Models of “green growth” or “resilient cities” are frequently transplanted from Euro-American contexts and imposed on Southern cities, sidelining local knowledge systems and grassroots priorities (Pieterse and Parnell, 2014). Mega-infrastructure projects branded as climate adaptation often displace informal settlements and informal workers, mirroring older patterns of exclusion rooted in colonial city-making. Thus, even contemporary planning frameworks can perpetuate climate injustices by privileging elite, globalized visions of urban futures over the lived realities of marginalized urban residents.

Neocolonialism, therefore, does not simply describe the persistence of economic dependency but also explains how climate policy and urban planning reproduce unequal power relations, reinforcing global hierarchies and limiting the agency of cities and communities in the Global South to craft locally grounded responses to climate change.

2.2.4 The environmental justice movement

The environmental justice movement, which gained prominence in the 1980s, was a response to these long-standing environmental and climate inequalities. Activists, particularly in the United States of America, highlighted the disproportionate environmental burdens borne by marginalized communities, especially in urban areas. The movement exposed the intersection of race, class and environmental harm, laying the foundation for the modern concept of climate justice. Today, climate justice emphasizes the need to address historical inequalities by ensuring that marginalized communities are at the centre of climate policy and action, particularly in urban settings.

The historical context of climate injustice in urban areas reveals a pattern of socio-economic and racial

discrimination that has concentrated environmental harms in vulnerable communities. Industrialization, segregation, redlining and colonial exploitation have all contributed to the disproportionate exposure of marginalized populations to climate risks. Addressing this legacy of inequality requires not only mitigating climate change but also pursuing policies that promote social and environmental justice, ensuring that all urban residents, regardless of background, live in safe and sustainable environments.

The environmental justice movement in India has emerged as a critical response to the disproportionate environmental burdens borne by marginalized communities, particularly Indigenous peoples (Adivasis), oppressed castes, rural populations and the urban poor. Rooted in the fight against large-scale industrial projects, deforestation, and displacement caused by dam construction and mining, the movement seeks to challenge inequities in environmental governance and resource allocation. Key issues include access to clean water, air and land, as well as the right to livelihood and protection from environmental degradation. Movements such as the Chipko Movement, the Narmada Bachao Andolan, and campaigns against coal mining in tribal areas have become symbolic of the broader struggle for environmental justice in India. These movements demand not only ecological sustainability but also social equity, highlighting the intersections between environmental degradation and social injustice in the country's development policies.

2.3 Judicial sensibility to climate change

A significant shift in the Indian legal landscape occurred when the Supreme Court of India (2024) placed climate change within the framework of fundamental rights, recognizing its impacts as violations of human dignity and equality. This ruling opens a new pathway for climate justice campaigns, embedding the language of rights into the struggle for equitable climate responses. It suggests that the ethical grounding of climate justice is inseparable from a human-rights perspective, whereby the state and its institutions are obliged to act in ways that protect the most vulnerable (Kothari and Bajpai, 2024).

Such a framing challenges the dominance of the technical, one-size-fits-all models that often characterize urban climate planning. The unevenness of the crisis—where the poorest and most marginalized bear the greatest burdens—demands frameworks that address historical stratification and unequal exposure to risk (Shi and others, 2016; Steele and others, 2015). Scholars such as Cohen (2018) argue that climate injustice reflects a simple reality: those who have contributed least to emissions are often the most gravely affected by the consequences of climate change. Similarly, Barnett (2006) identifies five defining features of climate injustice: (a) unequal responsibility for emissions; (b) disproportionate effects on vulnerable populations; (c) reinforcement of disadvantage; (d) deepening of underdevelopment; and (e) amplification of pre-existing inequalities. Newell and others (2020) further stress that justice must target the institutional and social arrangements that produce climate change and shape responses to it.

This claim is strengthened when seen from an intersectional lens. Marginalized groups are often doubly disadvantaged—poverty pushes them into climate-vulnerable spaces, while social exclusion tied to gender, caste, ethnicity and other marginalized identities compounds their risks (Tokar, 2020; Westman and Castán Broto, 2021). Urban climate plans, if inattentive to such dynamics, risk reproducing injustice rather than resolving it. As Mohtat and Khirfan (2021) remind us, exposure to hazards is not only environmental but also socially constructed through unequal access to housing, livelihood and infrastructure. Justice, therefore, must be embedded in the design of adaptation strategies, ensuring that grassroots struggles, labour movements and marginalized voices, rather than elite policy circles, shape urban climate action (Tokar, 2020).

Urban geographers such as Bulkeley and Betsill (2013) have urged a shift of focus to the city scale, where structural inequalities are most visible and grassroots mobilizations are active. Cities, home to both migrants seeking opportunities and to large populations in informal settlements, embody sharp contrasts of wealth and vulnerability (Steele and others, 2015). Top-down responses that fail to consider informal work and living arrangements thus miss the everyday realities of urban life. Instead, as climate justice movements suggest, starting from grassroots practices and social movements may reveal alternative pathways for sustainable and equitable design. Cohen (2018) extends this insight further, positing that climate justice, in its urban form, is best understood as a claim to the "right to the city".

2.4 Urban climate justice is the "right to the city"

The conceptual overlap between climate justice and the "right to the city" is striking, particularly in urban contexts across the Global South. Drawing on Henri Lefebvre's writings, scholars have interpreted the right to the city as encompassing three dimensions: (a) the right to access essential services; (b) the right to participate politically in urban governance; and (c) the right to recognition of difference within the city (Purcell, 2014; Harvey, 2012). These align directly with the distributive, procedural and recognitional pillars of climate justice, strengthening the argument that the two frameworks are mutually reinforcing.

Cohen (2018) builds on this convergence, asserting that urban climate justice is, in fact, the right to the city. This claim underscores the need to ground climate action not only in technical efficiency but also in democratic and inclusive urban politics. While critics often describe the right to the city as a vague or utopian notion, Cohen suggests that its value lies in reshaping urban debates and pushing policymakers to confront questions of power, access and equity.

Crucially, such arguments are not merely theoretical. In cities like Mumbai, grassroots organizations and urban activists already articulate their struggles through claims that mirror this equivalence. Their petitions, protests, lawsuits and public statements link climate vulnerabilities to broader demands for housing, infrastructure and democratic control over urban space (Roy, 2011; Doshi, 2013). By following such practices "from below", scholars can better connect climate justice debates to real-world urban movements, locating adaptation not within technocratic agenda but as part of everyday struggles for dignity and survival.

2.5 Three ideas of the "right to the city"

Lefebvre's notion of the right to the city rests on a critical refusal of exclusion and marginalization. Its first element is the right to be in the city—to resist displacement, to dwell well, and to access basic urban services in a manner that allows for a dignified life. Here, the claim is not for charity or temporary welfare but for secure, democratic access to urban resources as a matter of right (Lefebvre, 1996; Purcell, 2002). This has profound relevance for climate justice: marginalized groups are often denied adequate housing or services and are disproportionately located in climate-vulnerable areas. Linking climate justice to the right to dwell well highlights that equitable access to water, energy, sanitation and safe spaces is fundamental to building resilience.

The second element of the right to the city concerns the right to participate in the making of the city. Lefebvre and subsequent scholars emphasize that exclusion from services or spaces is often a symptom of deeper disenfranchisement, whereby poor and marginalized groups are systematically excluded from decision-making processes (Harvey, 2012; Marcuse, 2009). The right to the city, then, is not only about material access but also about political power—the right to collectively shape urban futures. This resonates with the procedural justice dimension of climate justice, which calls for inclusive and democratic participation in adaptation and mitigation planning.

Together, these two dimensions—the right to dwell well and the right to participate—recast the city as a collective resource rather than a domain controlled by private capital or elite interests. In doing so, they align directly with the aims of climate justice, which seeks equitable outcomes, inclusive processes and recognition of difference. Reframing climate action through the lens of the right to the city thus provides a powerful vocabulary for resisting exclusion and for advancing democratic, sustainable urban futures (Soja, 2010; Purcell, 2014).

Chapter 3. Vulnerable urban communities/ populations in the context of climate justice

3.1 Identifying vulnerable urban communities/populations

3.1.1 What are vulnerable urban communities/ populations?

Vulnerable urban communities and populations refers to those who are disproportionately affected by the impacts of climate change and other environmental hazards due to their socio-economic, demographic, geographic and political marginalization. These groups often live in environmentally hazardous areas, have limited access to resources, and face systemic barriers to recovery from climate-related events. Addressing their needs is crucial for achieving climate justice in cities. These groups include: (a) low-income communities; (b) residents of informal settlements (slums); (c) women, especially single mothers and gender minorities; (d) migrants, refugees and undocumented individuals; (e) workers in the informal economy; and (f) homeless populations.

3.1.2 How to identify vulnerable urban communities/populations

Identifying vulnerable urban communities and populations in the context of climate change is critical for creating equitable climate action plans and protecting those most at risk. Here are some key strategies that can help identify vulnerable groups:

- Map socio-economic vulnerabilities such as income levels, housing conditions and employment and livelihoods.
- Analyse geographic vulnerabilities, including proximity to hazardous zones, urban heat islands (UHIs), infrastructure and access to public services.
- Analyse demographic factors such as gender and disability.
- Analyse social marginalization and inequity as faced by migrants and refugees, Indigenous peoples, ethnic minorities, etc.
- Analyse public health data for indicators on pollution and access to healthcare.
- Access local knowledge through community engagement.
- Use climate impact assessments to help identify vulnerable urban communities by providing insights into which communities were most affected by a climate crisis and why.

3.2 Disproportionate impact of climate change on low-income and marginalized communities

Climate change has profound and wide-ranging impacts on cities, which are home to over half the global population and major hubs of economic activity. The increasing frequency and intensity of extreme weather events, rising temperatures and changing precipitation patterns significantly affect urban infrastructure, public health and socio-economic systems. Given their dense populations and reliance on complex networks for transport, energy and water, cities are particularly vulnerable to climate change.

The impact of climate change on cities is especially severe for vulnerable populations, exacerbating existing social and economic inequalities. Extreme weather events like heatwaves, urban heat island effects, flooding and storms are more frequent in urban areas, affecting low-income and marginalized communities and informal settlement residents disproportionately. These populations often live in areas with inadequate infrastructure (poor drainage, substandard housing, limited access to green spaces) making them more susceptible to climate hazards. These communities are also less likely to have the resources needed to adapt or recover from climate disasters. For example, wealthier populations can afford air conditioning, flood protection measures or relocation during extreme weather events, while disadvantaged groups may lack these options. The economic costs of climate change, arising from damage to property, loss of livelihoods, and increased spending on healthcare, affect these populations disproportionately, deepening existing inequalities.

3.3 Socio-economic determinants that exacerbate vulnerability

The socio-economic determinants that exacerbate vulnerability in the context of climate change are those factors that create unequal exposure to climate risks and limit the ability of certain populations to respond and recover. These determinants include:

Income and poverty. Low-income households are more vulnerable to climate impacts due to limited access to the financial resources needed for adaptation (e.g. for cooling systems, insurance or rebuilding after disasters). Poverty restricts mobility and the ability to recover from climate shocks.

Housing conditions. Poor quality housing, often found in informal settlements or low-income neighbourhoods, is less resilient to extreme weather events like floods, storms or heatwaves. These areas also lack proper infrastructure (e.g. drainage, sanitation and green spaces), increasing their exposure to climate risks.

Employment and livelihoods. Informal or precarious employment, common in low-income and marginalized groups, makes it harder for individuals to cope with climate impacts. Workers in the informal sector or those without social safety nets face higher risks of job loss or income disruption during climate disasters.

Lack of awareness. Lower levels of education reduce awareness of climate risks and limit access to information on adaptation strategies, making it harder for individuals and communities to prepare for or respond to climate events effectively.

Lack of access to healthcare. Limited access to healthcare exacerbates the vulnerability of populations exposed to climate hazards. For example, people without adequate healthcare services are more susceptible to heat-related illnesses, pollution-related respiratory diseases, or injuries from extreme weather events.

Social and political exclusion. Marginalized groups, including racial, ethnic and other minorities, migrants and Indigenous peoples, often face exclusion from decision-making processes, leaving them with limited influence over policies that affect their resilience to climate change.

Gender inequality. Women, particularly in low-income and marginalized communities, often have less access to resources, employment and decision-making power, increasing their vulnerability to climate impacts. Gendered roles, such as caregiving, can also limit their ability to respond to or recover from climate disasters.

Unequal access to public services and infrastructure. Unequal access to essential services, such as transport, emergency response systems and clean water, increases vulnerability. Those in underserved areas are less able to evacuate, access shelter or maintain health and safety during climate crises.

Discrimination and social marginalization. Discriminatory practices, whether based on race, ethnicity, caste, gender or disability, exacerbate the vulnerability of marginalized groups. These populations often reside in risk-prone areas, have fewer resources to recover from disasters, and face barriers to accessing aid or relief efforts.

Lack of legal and property rights. Lack of secure land tenure or legal protections limits the ability of vulnerable populations to adapt to climate impacts. For example, informal settlers may be forcibly displaced or excluded from receiving aid due to their undocumented status.

3.4 How spatial inequality increases vulnerability: addressing the role of spatial justice in climate change justice

Spatial justice, a concept rooted in geography and urban planning, examines how space is organized, controlled and distributed in ways that reinforce social, political and economic inequalities.

When viewed through the lens of climate change justice, spatial justice highlights the disproportionate distribution of environmental risks and benefits across different regions, communities and populations. Just as climate change affects marginalized communities disproportionately across the globe, its spatial impacts are also uneven, with the most vulnerable populations often living in areas most prone to environmental hazards. Understanding and addressing this spatial dimension is crucial for achieving broader climate justice.

3.4.1 Unequal exposure to climate risks

Spatial justice in the context of climate change justice recognizes that vulnerable populations are often concentrated in areas at high risk of climate-induced disasters. For example, low-income communities and marginalized groups in urban areas tend to live in neighbourhoods that are more exposed to hazards like flooding, extreme heat or air pollution. In coastal cities, informal settlements or slums are frequently located in low-lying, flood-prone zones, while wealthier residents live in safer, elevated areas. This spatial distribution of climate risks is a manifestation of historical and structural inequalities, whereby marginalized groups have been pushed to occupy less desirable, more dangerous spaces due to lack of economic resources, land rights or political influence. As climate change intensifies these risks, the need to address spatial inequities becomes more urgent.

3.4.2 Environmental injustice and spatial marginalization

Spatial justice is closely tied to environmental justice, which seeks to rectify the disproportionate exposure of marginalized communities to environmental harm. In both urban and rural contexts, spatial justice demands an examination of how land use, infrastructure and urban planning contribute to the unequal distribution of climate vulnerabilities. For example, hazardous facilities like factories or waste treatment plants are often located in areas where marginalized populations live, further exposing them to pollutants and health risks. This is compounded by the fact that these communities often lack access to green spaces, clean water or adequate housing, further exacerbating their vulnerability to climate change. The absence of equitable infrastructure also means that marginalized groups have limited access to climate adaptation resources. This translates to inadequate drainage systems in flood-prone areas, poor transportation options during evacuations, or lack of cooling centres during heatwaves. Spatial justice demands that these issues be addressed through inclusive urban planning and infrastructure development that prioritize the needs of those most at risk.

3.4.3 The role of land rights and displacement

Land rights play a critical role in the spatial dimensions of climate justice. Many marginalized communities, particularly Indigenous peoples, face land dispossession as a result of both climate change and mitigation efforts. Rising sea levels, desertification and other climate impacts can force entire communities to relocate, often without compensation or support. Similarly, climate mitigation projects, like conservation areas or renewable energy infrastructure, sometimes lead to the displacement of local communities, exacerbating spatial inequalities. For instance, large-scale renewable energy projects, such as wind farms or hydropower dams, can infringe on the lands of Indigenous peoples, displacing them without proper consultation or fair compensation. This highlights the importance of ensuring that climate change solutions do not perpetuate existing spatial injustices. A truly just approach to climate change must respect and protect the land rights of vulnerable populations, ensuring that they are active participants in decision-making about their lands and territories.

3.4.4 Towards spatial justice in climate adaptation and mitigation

Achieving spatial justice within the framework of climate change justice requires a commitment to inclusive, equitable planning that takes into account the specific vulnerabilities of different communities and regions. Urban planning must prioritize the needs of marginalized groups by improving infrastructure, enhancing disaster preparedness and ensuring access to essential services in high-risk areas. Spatial justice also calls for decentralized, community-driven solutions to climate change, such that local communities have control over how their spaces are managed in response to climate impacts. This may include empowering communities to develop local resilience plans, implementing nature-based solutions such as community-managed forests, or creating climate-safe housing and infrastructure that prioritizes the needs of those most affected by spatial inequalities.

In conclusion, spatial justice is an essential dimension of climate change justice, emphasizing the need to address the geographic distribution of climate risks and resources in an equitable way. By confronting the spatial inequalities that expose marginalized communities to disproportionate harm, we can move towards a more just and sustainable response to the climate crisis, ensuring that all communities have the right to live in safe, resilient and sustainable environments.

Chapter 4. Case studies: global examples of climate injustice/inequality

This chapter presents some global case studies that demonstrate how climate change affects vulnerable populations disproportionately—whether due to poverty, geography or historical inequalities—underscoring the need for climate justice in global policy and adaptation efforts.

4.1 Rising sea levels in Maldives

(Boyd, 2024)

Maldives, a low-lying island nation in the Indian Ocean, is at the forefront of the climate crisis due to rising sea levels caused by global warming. With its highest point only a few meters above sea level, Maldives risks becoming uninhabitable if sea levels continue to rise.

Injustice: Although Maldives has one of the smallest carbon footprints in the world, it is also among the countries most vulnerable to climate change. Its economy, heavily reliant on tourism and fishing, is at risk of collapse, and its citizens face the prospect of becoming climate refugees due to forces outside their control.

Lesson: The case of Maldives underscores the disproportionate burden that climate-vulnerable nations bear, despite their minimal contribution to global emissions. It highlights the urgent need for international climate mitigation and adaptation efforts, including financial support for small island states.

4.2 Drought and water scarcity in Cape Town, South Africa

(Calverley and Walther, 2022)

Cape Town faced a severe water crisis in 2018, narrowly avoiding Day Zero, a day when the city's water supply was expected to run dry due to prolonged drought. Wealthier residents were able to buy bottled water, install private water tanks or reduce their consumption through advanced technologies, while low-income communities were left with limited access to water.

Injustice: The water crisis affected poorer neighbourhoods, where residents relied on communal taps or rationed water deliveries, disproportionately. While wealthier households were able to mitigate the impact of the crisis through private means, vulnerable populations faced restrictions that exacerbated existing inequalities.

Lesson: This case study illustrates how climate-induced droughts and water scarcity exacerbate socio-economic inequalities, with wealthier residents having greater adaptive capacity. It highlights the need for equitable water management policies that prioritize access for vulnerable communities during climate crises.

4.3 Air pollution in Delhi, India

(Azad and Chakraborty, 2021)

Delhi, one of the world's most polluted cities, regularly experiences severe air quality crises, especially during the winter months when crop burning in neighbouring states, industrial emissions and vehicular pollution create hazardous levels of smog. The poorest residents of Delhi, who often live in overcrowded areas with inadequate ventilation, are the most affected.

Injustice: Vulnerable populations, such as low-income families, labourers and slum dwellers, are disproportionately exposed to poor air quality because they live in densely populated, high-traffic areas and lack access to air-filtration systems or healthcare. Children and the elderly are particularly susceptible to respiratory illnesses.

Lesson: The case of Delhi highlights how climate-related issues such as air pollution can disproportionately harm marginalized populations, who have the fewest resources to protect themselves. It calls for targeted policies to address urban air quality and protect vulnerable communities.

Chapter 5. Bridging the gap: the intersection of climate change justice and finance

The relationship between climate change justice and finance is a critical intersection in global efforts to address the climate crisis. Climate change causes disproportionate harm to vulnerable populations that have contributed the least to global greenhouse gas emissions, including low-income communities, Indigenous groups and developing countries. These communities often lack the financial resources to mitigate the impacts of climate change or adapt to its consequences, such as extreme weather events, rising sea-levels and disruptions to agriculture. Therefore, addressing climate change is not just a matter of environmental urgency but also of social and economic justice, which necessitates the involvement of equitable finance mechanisms.

5.1 Finance as a tool for climate justice

Finance has a pivotal role in the quest for climate justice. Equitable financial mechanisms can help bridge the gap between wealthier and more vulnerable populations by providing the resources needed for mitigation (reducing carbon emissions) and adaptation (adjusting to climate impacts). Three key areas where finance and climate justice intersect are: (a) climate finance; (b) loss and damage; and (c) just transition.

Climate finance. Climate finance refers to the financial resources provided by developed countries to help developing countries tackle climate change. This is a key component of international climate agreements like the Paris Agreement, which set a goal for developed countries to mobilize 100 billion US dollars per year by 2020 to support developing nations mitigate and adapt to climate change, and was reiterated and extended to 2025 (OECD, 2024). Adequate and predictable financial flows are necessary to ensure that the most vulnerable countries can build resilience to climate impacts and reduce emissions.

Loss and damage. Loss and damage refers to the irreversible effects of climate change, which go beyond what can be mitigated or adapted to, such as loss of lives, biodiversity and cultural heritage. The concept is particularly relevant to small island nations and other vulnerable countries facing existential threats due to climate change. Financial compensation for loss and damage is increasingly seen as a matter of justice, as these nations demand reparations from major historical polluters (Mishra and others, 2020). Recent global climate negotiations, such as the 27th Conference of the Parties (COP27), have seen progress in establishing a loss and damage fund, but the challenge lies in operationalizing this financial mechanism and ensuring its equitable distribution.

Just transition. The concept of "just transition" seeks to ensure that the shift from a fossil-fuel-based economy to a low-carbon economy is fair and inclusive, particularly for workers and communities dependent on carbon-intensive industries. Finance plays a crucial role in funding retraining programmes, creating green jobs, and supporting the economic diversification of regions affected by the decline of fossil fuels. For a just transition to be equitable, financial investments must be directed towards vulnerable populations, preventing economic displacement and ensuring that the benefits of a green economy are widely shared.

5.2 Challenges and opportunities

While climate finance holds great potential to advance climate justice, there are several challenges. First, the available financial resources are inadequate for the scale of the crisis. Developing countries often face bureaucratic hurdles in accessing international climate funds, and the amount pledged by wealthier nations has fallen short of what is required. Additionally, the private sector must play a more significant role in climate finance, especially by incorporating social justice principles into investments, such as by prioritizing sustainable and inclusive projects.

At the same time, there are opportunities to innovate in climate finance through mechanisms like green budgeting, green bonds, carbon pricing and evolving an impact economy. Such financial approaches, if properly aligned with the principles of justice, can help channel resources to where they are most needed.

In conclusion, the relationship between climate change justice and finance is vital to ensuring a fair and equitable global response to the climate crisis. Effective financial mechanisms, designed with an eye towards justice, can help redress historical inequities, support vulnerable communities and promote a sustainable, inclusive future.

Chapter 6. Framework for climate justice in cities

There are several key principles that should guide the development of an equitable climate justice framework for cities, focusing on inclusive planning, equitable policies and community-driven solutions. Some of these are discussed below.

6.1 Key principles for a climate justice framework focusing on vulnerable urban populations

Equitable distribution of benefits of climate actions. Ensuring that the benefits of climate action, such as clean energy, green spaces and climate-resilient infrastructure, are accessible to all communities. This includes targeting investments in green infrastructure, public transport, energy efficiency and renewable energy to low-income and marginalized communities. Cities should prioritize improving infrastructure in underserved areas, like flood-prone neighbourhoods and urban heat islands.

Equity-focused policy development. Policies that address climate change must focus on reducing existing social and economic inequalities. This involves creating climate action plans that not only aim to reduce emissions and increase climate resilience but also aim to improve living conditions for disadvantaged groups. Policies should ensure access to affordable housing, clean energy and climate-resilient infrastructure, particularly in historically underserved areas.

Accountability. Creating mechanisms to hold governments and institutions accountable for the equitable implementation of climate policies.

Intersectionality. Climate justice must be understood through an intersectional lens, acknowledging how overlapping identities—such as race, caste, gender and socio-economic status—interact to compound vulnerabilities. Policies must address these intersections to create inclusive and effective solutions.

Gender equality. Gender equality must be part of any climate justice framework, particularly when addressing the needs of vulnerable urban populations. Women, especially in marginalized communities, often face greater risks from climate change due to pre-existing social inequalities, limited access to resources, and their role as primary caregivers. Integrating gender equality into climate policies ensures that the unique challenges that women face are addressed, such as by improving their access to clean energy, safe housing and economic opportunities. Empowering women in decision-making processes and climate adaptation strategies strengthens community resilience and promotes more inclusive, equitable solutions to urban climate challenges.

Polluter pays principle. The "polluter pays" principle is a key element of climate justice, asserting that those responsible for the most emissions should bear the costs of mitigating climate change. Urban climate justice frameworks should incorporate this principle, requiring corporations, industries and high-carbon sectors to fund adaptation and resilience projects in vulnerable communities.

Inclusivity, representation and participation. Climate justice requires the meaningful involvement of all communities, especially those disproportionately affected by climate change. This includes actively engaging low-income, Indigenous and minority groups in planning and decision-making processes. Cities should ensure diverse representation in climate action planning through public consultations, participatory governance models and community-led initiatives.

The role of communities in climate justice. Central to climate justice is the idea that communities must play a leading role in shaping climate action. Community-driven solutions are often more effective and sustainable as they are rooted in local knowledge and tailored to specific needs. The following strategies can enhance community involvement in urban climate action:

- ***Participatory planning and decision-making.*** Cities should adopt participatory planning approaches that invite marginalized communities to co-create climate action plans. This can involve public forums, workshops and advisory councils that give residents the opportunity to shape policy. Ensuring that marginalized communities have decision-making power is critical to achieving equitable outcomes.

- ***Community-led initiatives.*** Encouraging community-led initiatives, such as local renewable energy projects, urban agriculture and neighbourhood climate resilience programmes, can empower communities to take control of their own climate futures. Cities should provide funding, technical assistance and capacity-building resources to support such efforts.

- ***Capacity building and education.*** To ensure meaningful participation, cities must invest in capacity building and climate education for marginalized communities. This involves providing accessible information about climate risks, adaptation strategies and available resources. Educational programmes can help communities understand their role in climate action and equip them with the tools to advocate for equitable policies.

6.2 Mitigation and adaptation strategies for climate change impacts in cities

Mitigation and adaptation strategies for climate change impacts in cities focus on reducing greenhouse gas emissions and improving energy efficiency while fostering sustainability. These strategies are essential in urban areas, where high population density and transportation and industrial activity contribute significantly to climate change. Some such key strategies are discussed below:

6.2.1 Mitigation strategies

Mitigation focuses on reducing or preventing the causes of climate change, particularly by lowering greenhouse gas emissions and enhancing carbon sinks. Their goal is to slow down or stop the progress of climate change so as to limit its long-term impacts on the planet. Mitigation strategies include:

Expand urban green spaces to absorb more carbon dioxide from the atmosphere. Creating and expanding green spaces, such as parks, community gardens and urban forests, helps cities mitigate climate change by absorbing carbon dioxide and reducing the urban heat island effect. The phenomenon of "urban heat islands", which occur when cities become significantly warmer than surrounding areas, has a disproportionate effect on low-income neighbourhoods with fewer trees and green spaces. Cities can mitigate these effects by planting trees, creating parks and installing green roofs in underserved areas. Policymakers should promote urban greening through policies that encourage tree planting, green rooftops and the preservation of natural ecosystems.

Promote affordable and sustainable public transport. Investing in sustainable public transport options, like buses, trains, trams and electric vehicles (EVs), reduces reliance on fossil-fuel-powered cars, lowering greenhouse gas emissions and air pollution in cities. Cities can incentivize the use of public transport through subsidies, fare reductions and infrastructure improvements, making commuting more accessible, affordable and sustainable. Sustainable transport options reduce air pollution and make cities more liveable for all, particularly for those disproportionately exposed to pollution.

Adopt energy-efficient building codes. Implementing and enforcing energy-efficient building codes can significantly reduce energy consumption in cities. Green buildings that use energy-efficient materials, insulation and heating and cooling systems lower energy demand, cutting carbon emissions. Retrofitting older buildings to meet these standards is equally important. Cities can promote energy efficiency through financial incentives, tax breaks and programmes that promote sustainable construction practices, thus reducing their overall carbon footprints.

Transition to renewable energy (e.g. solar, wind) to reduce reliance on fossil fuels. Cities can mitigate climate change by transitioning from fossil fuels to renewable energy sources such as green hydrogen, solar, wind and geothermal. This reduces greenhouse gas emissions from electricity generation, a major contributor to urban carbon footprints. Municipal governments can lead by example, installing solar panels on public buildings, incentivizing renewable energy adoption for businesses and residents, and integrating renewables into the city's energy grid.

Promote circular economy practices. A "circular economy" aims to minimize waste and make the most of resources by keeping products, materials and energy in use for as long as possible. By reducing waste, reusing materials and recycling, cities can lower emissions from production and disposal processes significantly. Circular economy practices also reduce the demand for new raw materials, cutting emissions from mining and manufacturing. Governments and businesses can encourage a circular economy by supporting eco-friendly product design, enforcing waste-management regulations and promoting recycling programmes.

Implement carbon pricing and emissions trading schemes to reduce greenhouse gas emissions. Carbon pricing mechanisms, such as carbon taxes and cap-and-trade systems, assign a monetary cost to carbon emissions, encouraging businesses and individuals to reduce their carbon footprints. By making it more expensive to emit carbon, such policies incentivize the adoption of cleaner technologies and practices. Revenue from carbon pricing can be invested in renewable energy projects, energy efficiency programmes and social equity initiatives. Effective carbon pricing policies are designed to gradually increase the cost of emissions, providing a clear signal to transition towards a low-carbon economy.

Implement programmes for waste management and recycling to minimize methane emissions from landfills. Effective programmes for waste management and recycling help reduce methane emissions from landfills, a potent greenhouse gas. Cities can mitigate waste-related emissions by promoting recycling, composting and waste-to-energy technologies. Programmes that encourage the reduction of single-use plastics and waste, alongside public education campaigns, can raise awareness and shift consumer behaviour towards a more sustainable, circular economy.

Encourage climate-education and public engagement. Raising awareness about climate change and engaging the public in climate action is essential for long-term mitigation efforts. Cities can implement educational programmes in schools, hold community workshops and partner with local organizations to foster public understanding of climate issues. Engaging citizens in local climate policies, such as neighbourhood energy-saving programmes or community clean-up projects, empowers people to take action and contribute to the city's climate goals.

6.2.2 Adaptation strategies

Adaptation strategies focus on adjusting to the effects of climate change, aiming to reduce the vulnerability of people, infrastructure and ecosystems to impacts that are already occurring or are expected in the future. Their goal is to enhance resilience to changes brought about by climate change. Adaptation strategies include:

Enhance water-management systems. Climate change is exacerbating water scarcity and increasing the frequency of floods in cities, especially in cities with ageing infrastructure. Vulnerable populations, particularly those in informal settlements, often lack reliable access to clean water and sanitation. Cities should prioritize upgrading water infrastructure. Implementing efficient water-management systems, such as rainwater harvesting, grey water recycling and permeable pavements, helps cities cope with these challenges.

Develop climate-resilient infrastructure. Cities should invest in climate-resilient infrastructure designed to withstand the impacts of climate change, such as extreme weather events, flooding and heatwaves. Nature-based solutions like green roofs, permeable pavements and storm-water management systems can mitigate risks and enhance urban resilience. Such infrastructure improvements reduce the long-term economic and environmental costs of climate impacts while ensuring the sustainability of urban systems.

Provide affordable and resilient housing. Providing affordable, climate-resilient housing is critical for protecting vulnerable populations from the impacts of climate change. Low-income households often live in areas prone to flooding, extreme heat or poor air quality, and in buildings that are not equipped to withstand these conditions. Cities can mitigate these risks by investing in housing retrofits, improving insulation, strengthening roofs and constructing homes that are energy-efficient and resilient to extreme weather. Public housing projects should prioritize climate-resilient designs to protect the most vulnerable.

Establish early warning systems for extreme weather events. Establishing early warning systems for extreme weather events is a vital adaptation strategy for protecting vulnerable urban populations from the increasing frequency of climate-related disasters. Such systems provide timely alerts for

floods, storms, heatwaves and other hazards, allowing at-risk communities to take preventive measures and reducing the potential for loss of life and property. By incorporating localized data and ensuring clear communication channels, early warning systems help enhance the resilience of urban areas, particularly for marginalized groups with limited resources to cope with climate impacts.

Create heat-resilient urban design (cool roofs, shaded areas). Creating heat-resilient urban design is an essential adaptation strategy for protecting vulnerable urban populations from rising temperatures due to climate change. By incorporating cool roofs, shaded areas and green spaces, cities can reduce the urban heat island effect, making urban environments safer and more liveable during heatwaves. Such design features are particularly crucial for low-income communities, who often lack access to air conditioning and are more susceptible to heat-related health risks.

Improve disaster preparedness and response plans. Improving disaster preparedness and response plans is a crucial adaptation strategy for vulnerable urban populations facing the increasing frequency of climate-related disasters like floods, storms and heatwaves. By strengthening early warning systems, evacuation protocols and emergency shelters, cities can better protect at-risk communities who often lack the resources to recover quickly from such events. Ensuring that disaster response plans are inclusive and accessible to marginalized groups enhances resilience, reduces loss of life and mitigates the socio-economic impacts of climate disasters.

Implement flood-resilient zoning and land-use policies. Implementing flood-resilient zoning and land-use policies in urban areas is crucial for protecting vulnerable populations from climate-change-induced flooding. Such policies can prevent construction in high-risk flood zones and promote the development of green spaces or wetlands that absorb excess water. By regulating land use, cities can reduce the exposure of low-income and marginalized communities to flood risks, minimizing property damage and enhancing long-term safety.

Improve access to healthcare and emergency services during climate disasters. Improving access to healthcare and emergency services during climate disasters is a crucial adaptation strategy for vulnerable urban populations, as they are often disproportionately affected by extreme weather events like heatwaves, floods and storms. Ensuring timely medical care and emergency response can reduce mortality rates and health impacts significantly, especially for low-income communities with limited resources. This strategy also involves strengthening healthcare infrastructure and creating disaster-resilient systems to provide uninterrupted services during crises, safeguarding the well-being of the most at-risk groups.

Develop localized energy solutions for low-income areas. Energy access is a critical issue for vulnerable populations, especially during extreme weather events. Cities can develop localized, renewable energy solutions, like community solar projects, to ensure affordable and reliable energy for low-income areas. This reduces dependence on fossil fuels, lowers energy costs and provides resilience during power outages. Supporting energy cooperatives and offering subsidies for solar panels in low-income communities can also empower residents to manage their own energy needs.

Enhance community engagement. Empowering vulnerable populations with knowledge of climate risks and solutions is key to building resilience. Engaging communities in planning and decision-making processes ensures that local climate action plans reflect the needs and priorities of marginalized groups. Building climate literacy fosters a sense of ownership and responsibility in addressing climate challenges.

Chapter 7. Developing, implementing and monitoring an effective climate action plan

Developing a climate action plan that centres justice requires a holistic approach, addressing both mitigation (reducing emissions) and adaptation (preparing for climate impacts). The elements below are critical to crafting, implementing and monitoring an equitable climate action plan for cities.

Assess vulnerabilities and map risks. Begin by conducting a comprehensive assessment to identify the most vulnerable populations and the climate risks they face. This involves mapping areas prone to flooding, the urban heat island effect, air pollution and other climate hazards. Collect data on the social, economic and health vulnerabilities of low-income communities, racial and ethnic minorities, the elderly, children, people with disabilities and other marginalized groups. Use participatory methods to engage community members in identifying their own specific climate risks and challenges.

Develop inclusive action plans. Create climate action plans that prioritize the needs of vulnerable populations, ensuring that the voices of marginalized communities are central to decision-making processes. Engage local leaders, community-based organizations and residents to co-create solutions that address both environmental and social inequalities. Action plans should include measures to improve access to housing, healthcare, transport and energy for vulnerable groups, while also enhancing their resilience to climate impacts like extreme weather and rising temperatures.

Establish partnerships with community-based organizations. Collaborate with community-based organizations that work with vulnerable populations to ensure the successful implementation of the action plan. Community-based organizations have deep ties to local communities and can help bridge the gap between government institutions and marginalized groups. These partnerships can facilitate outreach and education, and the provision of support services like housing retrofits, disaster preparedness and energy efficiency programmes.

Secure funding and resources. Allocate sufficient financial and human resources to implement the climate justice action plan. Secure funding from local government budgets, national programmes and international climate funds. Prioritize investments in green infrastructure, renewable energy, affordable housing and public services that benefit vulnerable populations. Ensure that funds are equitably distributed, with transparent processes for tracking expenditure and ensuring accountability.

Implement targeted programmes and policies. Execute targeted programmes that address both climate resilience and social equity. For example, create affordable energy programmes to install solar panels or improve energy efficiency in low-income housing. Set up cooling centres and green infrastructure in heat-prone areas to serve vulnerable populations. Implement flood protection measures, such as storm-water management systems, in low-lying neighbourhoods. Policies should be designed to improve the living conditions and resilience of marginalized groups while reducing their exposure to climate hazards.

Foster climate education and capacity building. Provide education and training programmes to vulnerable populations, focused on climate resilience and adaptation. This could include workshops on energy efficiency, water conservation, disaster preparedness and sustainable livelihoods. Partner with schools, community centres and local leaders to spread awareness of climate risks and solutions. Build local capacity by training residents in green jobs, such as renewable energy installation, urban farming and climate-resilient construction, to enhance economic opportunities for marginalized groups.

Monitor progress with inclusive indicators. Establish a set of clear, measurable indicators to monitor the progress of the action plan. These indicators should track both the plan's environmental outcomes and its social impacts on vulnerable populations. Metrics can include reductions in greenhouse gas emissions, improvements in air quality, increases in access to clean water, and the number of affordable housing units retrofitted for energy efficiency. Involve community members in monitoring efforts to ensure transparency and accountability.

Create feedback mechanisms. Develop mechanisms for continuous feedback and community engagement throughout the implementation process of the action plan. Set up regular town hall meetings, surveys and digital platforms where vulnerable populations can voice their concerns, provide inputs and suggest improvements to ongoing initiatives. Ensure that these feedback channels are accessible to all, especially

those without access to digital tools, by providing community-based touchpoints.

Adjust and adapt the action plan. Climate impacts and social vulnerabilities evolve over time, so it is important to periodically review and adjust the action plan. Analyse data from the monitoring phase to assess what is working and what needs improvement. Make adjustments based on community feedback and changing climate risks. This ensures that the action plan remains responsive to the needs of vulnerable populations and continues to prioritize climate justice.

Report and communicate results. Regularly report the progress of the action plan to the public, especially to vulnerable communities. Transparent communication builds trust and ensures accountability. Share success stories and highlight the impacts of interventions on improving the resilience and well-being of marginalized populations. Use a variety of communication channels, including social media, local media and community events, to ensure broad reach and understanding.

Chapter 8. Case studies: mitigating climate change impacts on vulnerable populations

Although there are relatively few case studies that highlight positive examples of climate justice, this underscores the substantial work still needed to tackle the issue. However, some case studies do focus on innovative strategies aimed at addressing the disproportionate impacts of climate change on marginalized and vulnerable communities. By prioritizing equitable solutions, they offer critical insights into how urban areas can enhance climate resilience while ensuring social justice.

8.1 Women leading community climate resilience in Ahmedabad, India

(Galvin and Maassen, 2020)

In Ahmedabad, rapid urbanization and climate-change-induced challenges—such as extreme heat, water scarcity and flooding—affect the city's slum residents disproportionately. These informal settlements are highly vulnerable due to poorly built homes that offer little protection from environmental hazards. Additionally, women in these communities face heightened risks, as they often engage in home-based work, making them more susceptible to the impacts of heat and water scarcity.

Following a deadly heatwave in 2010 that claimed over 1,300 lives, the Mahila Housing Trust initiated a community-driven climate resilience programme. They trained local women leaders, called Vikasinis, to conduct climate vulnerability assessments in the city's slums. This initiative focused on identifying specific climate-related risks and designing solutions that addressed the unique needs of these communities.

Through partnerships with technical institutions, innovators and technology providers, the Vikasinis played a critical role in testing and implementing practical climate resilience solutions at household and neighbourhood levels. This community-led approach produced technically appropriate and financially viable solutions, such as:

- White reflective paint for rooftops to reduce indoor temperatures during extreme heat.
- Rooftop rainwater catchment systems to store water during heavy rains, mitigating both flooding and water scarcity.
- Water meters to monitor and reduce water wastage in slum communities.

By bridging the gap between technical solutions and community needs, the Vikasinis and the Mahila Housing Trust made climate resilience accessible, sustainable and scalable.

8.1.1 Key lessons learned

1. Empowering women as climate leaders. The involvement of women, especially from vulnerable communities, is essential to driving successful strategies for climate resilience.

2. Localized, community-led solutions. The initiative demonstrated that solutions must be rooted in local contexts.

3. Partnerships with technical experts. Collaborating with technical institutions and innovators helps bridge the gap between available solutions and community needs, ensuring that interventions are both effective and affordable.

4. Influencing municipal decisions. This initiative demonstrated that community-led initiatives can make climate resilience a municipal priority.

5. Community ownership. By placing responsibility for assessment and solution implementation in the hands of the community, particularly women, the project ensured long-term sustainability and ownership, increasing its likelihood of success in other regions.

6. Flexible, low-cost interventions. The solutions developed were both financially attainable and adaptable to a wide range of urban environments, making this model feasible for cities worldwide with similar climate vulnerabilities.

This model of community-driven climate action has proven highly adaptable and replicable. Its success in Ahmedabad has inspired similar initiatives across South Asia, reaching more than 125,000 people in 107 slums across 6 other cities. The case of Ahmedabad highlights the power of local, women-led climate resilience measures in addressing urban climate challenges, demonstrating that the most vulnerable populations can be active participants in building safer, more sustainable cities.

8.2 Urban agriculture for climate resilience in Rosario, Argentina

(Galvin and Maassen, 2020)

Rosario, Argentina, has been grappling with rising temperatures and increased precipitation as a result of climate change. These climate challenges intersect with deep-rooted urban inequality, a legacy of Argentina's 2001 economic crisis, which left over 25 per cent of Rosario's residents unemployed. In 2014, as the city embarked on its strategic climate planning, officials saw an opportunity to leverage existing initiatives, specifically the city's urban agriculture programme, to boost climate resilience.

Rosario's urban agriculture programme provides low-income residents with access to unused public land, converting over 75 hectares into productive gardens. These gardens, which grow fruits and vegetables sold at seven local farmers' markets, have had far-reaching benefits, such as:

- Economic empowerment. The programme offers a source of income for poorer residents.
- Flood mitigation. The garden soil absorbs rainwater, reducing pressure on the city's weak drainage systems.
- Urban cooling. The gardens help combat the urban heat island effect, naturally cooling surrounding areas.
- Emissions reduction. By promoting local food production, the programme reduces greenhouse gas emissions associated with long-distance transport in the food supply chain.

8.2.1 Key lessons learned

1. Leveraging existing initiatives. Rosario successfully reoriented an existing urban agriculture initiative to boost climate resilience. This demonstrates that cities can build on current programmes rather than starting from scratch, aligning them with broader climate goals.

2. Multifaceted benefits. Urban agriculture provides both environmental and social benefits, from flood prevention and temperature control to economic empowerment and food security for vulnerable populations.

3. Inclusive climate action. By involving low-income residents in the programme, Rosario ensured that climate resilience efforts directly benefited the city's most vulnerable, contributing to a more equitable response to climate change.

4. Low-cost intervention. The programme demonstrated that climate action doesn't always require high-tech solutions. Low-cost, nature-based interventions like community gardens can yield significant climate and social benefits.

5. Cross-sector collaboration. The success of Rosario's initiative highlights the importance of collaboration between city officials, communities and local markets, making it a replicable strategy for cities looking to enhance resilience while addressing socio-economic inequality.

As the programme has grown, its climate change mitigation benefits have become more evident, transforming it into a cornerstone of Rosario's climate resilience strategy. Rosario's urban agriculture programme is a prime example of how a simple, community-focused initiative can become a powerful tool for climate resilience and social equity.

8.3 How Mumbai's Ambojwadi is responding to climate change, India

(Chhabri and Jacob, 2023)

Ambojwadi, an informal settlement in north-western Mumbai, faces acute vulnerability to climate change impacts, particularly from frequent floods and cyclones. Home to approximately 40,000 residents, this low-lying settlement is surrounded by wetlands, mangroves and the coastline, making it highly susceptible to environmental disasters.

In response, the community of Ambojwadi, with support from a Mumbai-based organization called Youth for Unity and Voluntary Action (YUVA), has begun to organize and prepare for the impacts of climate change. Residents, led by community leaders, women and the youth, have formed a first-response team trained to handle emergencies like heavy rainfall or cyclones. This team has worked closely with local government departments and has even participated in rescue missions in neighbouring settlements. Ambojwadi's increased vulnerability can be linked to the loss of protective mangroves, cleared for infrastructure projects. Recognizing this, YUVA has also initiated awareness campaigns about mangrove conservation, engaging local youth through murals, street plays and film screenings to emphasize the importance of preserving these natural barriers.

8.3.1 Key lessons learned

1. Community preparedness. By forming first-response teams, Ambojwadi has taken a proactive approach to disaster preparedness. This highlights the importance of equipping vulnerable communities

with the skills and resources to respond to climate emergencies, enhancing resilience from within.

2. Role of youth and women. Women and youth have played pivotal roles in this initiative, demonstrating that climate resilience efforts should be inclusive and engage all community members for long-term success.

3. Conservation of natural ecosystems. The loss of mangrove forests has made the community more vulnerable, showing the critical need to protect natural ecosystems as part of climate adaptation strategies.

4. Collaboration with local authorities. The success of Ambojwadi's approach relies heavily on cooperation between the community and local government, demonstrating that effective climate action requires partnerships between grassroots initiatives and institutional support.

The case of Ambojwadi showcases how an informal settlement, despite limited resources, can organize, innovate and mobilize to confront climate risks. By focusing on community preparedness, conservation and creative outreach, Ambojwadi offers a replicable model for other vulnerable urban areas facing the challenges of climate change.

Chapter 9. Conclusion and call for action

Integrating justice into climate action plans is critical to achieving sustainable and equitable solutions to the global climate crisis. Climate change has a disproportionate effect on marginalized communities—those living in poverty, informal settlements and areas with limited infrastructure—while these populations often contribute the least to the greenhouse gas emissions driving climate change. Addressing this injustice by embedding climate justice principles into action plans ensures that vulnerable communities are protected, and that the benefits of climate resilience, such as access to clean energy, public health improvements and green jobs, are equitably distributed. Cities, as centres of population density, economic growth and innovation, are uniquely positioned to lead the global movement for climate justice. Urban areas house more than half the world's population and generate the majority of global emissions, which gives cities both the responsibility and the opportunity to be at the forefront of equitable climate solutions. City leaders can set a global precedent by adopting inclusive approaches to urban planning that prioritize marginalized communities and raise their voices in decision-making processes.

The urgency of integrating justice into climate action plans cannot be overstated. As climate-related disasters like floods, heatwaves, water scarcity and air pollution continue to intensify, the risk to vulnerable populations escalates, with life-threatening consequences. Without immediate action, these communities will continue to face disproportionate harm and social inequities will deepen, exacerbating poverty, displacement and health crises. A just transition to a sustainable future requires city leaders, planners and communities to act now. This is not only a moral imperative but also a practical necessity. By ensuring that no one is left behind in the transition to climate resilience, cities can build a more inclusive, stable and prosperous future for all. Failure to address climate justice today will result in far greater social and economic costs tomorrow, as the impacts of climate change continue to worsen and vulnerable communities are forced to bear the brunt of escalating climate-related risks.

This is a call to action for city leaders, urban planners and community organizers: prioritize climate justice in your plans and policies. Invest in green infrastructure that benefits low-income neighbourhoods, create accessible spaces for public participation, and ensure that those most affected by climate change have a seat at the decision-making table. Cities have the power to reshape the future by adopting climate policies that address both environmental and social inequities. The time to act is now—to protect future generations, secure a liveable planet and ensure that the transition to a sustainable world is inclusive and just for all. Only through collective, immediate action can we create resilient, equitable cities that thrive in the face of climate change.

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About the author

Tikender Panwar is an urban scholar and former Deputy Mayor of Shimla city. He has authored two books: Cities in Transition and The Radical City. He has represented the city of Shimla and the country on several international platforms, like the COP 21, the World Resilient Cities Congress, the BRICS Conference and the UN Habitat III Conference, amongst others. He is a regular contributor to national dailies like The Hindu, The National Herald, Newsclick, Urban Update and more. He is Adviser to national think tanks like Samruddh Bharat, the National Institute of Urban Affairs and BORDA. He is the Convenor of the National Coalition for Inclusive and Sustainable Urbanization (NCU) and National Convenor of CITYZENS, an advocacy group for alternative urban paradigms based on "people first". He is currently a Member of the Kerala Urban Policy Commission.

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Responsible
Christoph P. Mohr, Country Director
Mandvi Kulshreshtha, Senior Program Adviser,
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