

Climate Vulnerability in South Asia's Coastal Cities

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Introduction

The vulnerability of South Asia's coastal cities to climate change is already evident and is anticipated to be broad and deep, challenging the capacities of cities to manage and plan their ecological, social, administrative and political futures.¹ Home to tens of millions of residents and growing exponentially – the six largest cities in Bangladesh, India and Pakistan have a combined population of more than 73 million² – many of these coastal cities are larger than countries and are at once global and local, encompass trading centers and peri-urban locales, and often, are both the source and receivers of migrants.³ They are situated along rising seas, exposed to changing monsoons and shortages of potable water, their sources of food for their increasing populations are potentially compromised, and by extension, limits the effectiveness of their governance. Rapid population growth and expanding urban footprints are also challenging their capacities to regulate (and with time, limit) energy consumption, while at the same time radically altering the landscape of their environments. The resource availability of the region's urban areas is already constrained, and their many models of urban growth and social and political development add pressure across the entire spectrum of urban sustainability, financial resilience⁴ and governance.

The paired strengths and climate-related vulnerabilities of south Asia's coastal cities is fascinating, puzzling and potentially instructive in ways that go beyond the basic contours of climate change.

The governance capacities of these coastal cities are closely tied to national policy choices about state security, environmental wellbeing, and their links to climate security.⁵ Each of these policy arenas is additionally tested by the stresses of changing climates in ways that may permanently alter the political economy of coastal states that are already home to more than 1.7 billion residents. The region's coastal cities are often managed by a combination of state and local mechanisms, as well as formal and informal

social and political systems that – while often reflecting imagination and resilience, whether planned or spontaneous – can both support and undercut the basic needs of governance, reshape the capacity to govern well (and sometimes, at all), provide the foundation for fiscal security, and exacerbate and/or reinforce inequalities and inequities. These factors raise general questions about the capacities and durability of south Asia's coastal cities and their relationships to the states in which they live. They also raise specific questions about the nature of vulnerability and prospects for adaptation for the region's people and states, and for their relationships with one another.⁶

The physical threats to south Asia from changing climates and challenging conditions for responding to them are increasingly well documented, and include rising sea levels, floods and droughts, diminishing access to potable water, glacial melting, and extreme temperatures.⁷ Derivatively, of course, rising temperatures and climate changes are likely to – and some would argue, already have – create conditions for malnutrition, serious and more varied diseases that threaten public health, declining air quality, and multi-directional forced migration.⁸ These phenomena are likely to exacerbate the region's coastal urban environments in ways that can already be seen: changing relationships between land and water that lead to food and water insecurity are the most obvious, accompanied by changing coastlines that threaten habitats, housing and livelihoods, and other basic elements of human security.

Such tangible threats – all documented in news reports, academic research and (with large variations) government policies – are only part of the region's challenge. Equally profound, and equally hard to predict and manage, are non-climate based characteristics of its states and cities, including their governance, economic policies, social practices and regional relationships.⁹ The nature, causes and consequences of urban – and particularly coastal urban – vulnerabilities to climate change are critical elements of our understanding of the region and its people.

South Asia's urbanists often assume that its cities are – and, perhaps, can continue to be – more resilient in the

face of climate change than many of its rural areas. The concentration of resources and potential for communal responses have, historically and contemporarily, drawn new populations to its megacities and smaller towns: a human portrait of south Asia today depicts dense and rapidly growing populations, enormous wealth (perhaps unimaginable at the end of the colonial era seventy years ago) juxtaposed with profound poverty, contemporary design next to eroding infrastructure – and almost always, a sense that cities, and particularly port cities, find a way to absorb newcomers even if resources are inadequate and urban governments are often unrepresentative, inefficient and paradoxically, unresponsive to their human and natural environments.

South Asia is among the hottest regions on earth: its access to water was profoundly stressed long before its population grew to its current proportions. Its regional relations are habitually pugnacious and enduringly fragile. Coastal factors, and the complex governance of each state in the region, are familiar elements of climate analyses in and around the region. They provide one context, although not an exclusive one, for understanding climate vulnerability.

The paired strengths and climate-related vulnerabilities of south Asia's coastal cities – inward-looking, with their continuing deep ties to the region's agrarian interiors, and traditionally outward-looking toward life beyond the seas – is fascinating, puzzling and potentially instructive in ways that go beyond the basic contours of climate change. What makes these cities vulnerable, with and without climate change? What is it about their histories, locations, economies and societies, and their governing habits and institutions that explain their specific vulnerabilities to climate change? Does the experience of these cities help to clarify the meaning of climate-related urban vulnerability (or vulnerabilities), and therefore, help to explain the ways that discussions of adaptation, resilience and mitigation can be understood in the region's coastal environments?¹⁰ Do these experiences usefully frame broader questions about the complexities of the region and its future response to the growing emergencies that climate change brings? And perhaps most critically, how do we join the language and concepts of political economy and climate science to make sense of the long

experiences and intricate systems and structures of these urban environments?

To explore these questions, the Strauss Center for International Security and Law at the University of Texas at Austin and the Center for International and Regional Studies at Georgetown University in Qatar convened a group of urban and climate change scholars for a two-day workshop in Doha in January 2017.¹¹ The discussion sought to understand two related phenomena: first, climate-related vulnerability, and second, the kinds of vulnerability that intersect with changing patterns of governance in south Asia and their consequences for the region's states and societies. These two sets of issues helped to set an agenda that comprised urban ecology, planning and finance, government and politics on the one hand, and on the other, habitat hazards, environmental vulnerability and adaptive capacity. Differing concepts of vulnerability and adaptation weave through both sets of issues; together, they interrogate the ways that politics and policies affect, and are affected by, the slow and sudden-onset emergencies that comprise climate change, and the ways the region's coastal cities plan and respond to them.

The workshop was organized around a quartet of interlocking questions about coastal cities and their own understandings of their societies, politics, economies and governing capacities in the face of increasing climate-related threats; the relationship between urban, rural, local and national policies and practices; and by extension, the relationship of coastal cities and their states to one another.¹²

Vulnerability. How should we understand climate-related vulnerability in south Asia's changing urban contexts? How do such vulnerabilities illustrate evolving physical conditions, local constructs, the fundamentals of planning, particular social and economic factors, complex emergencies, and critically, attributes of governance? Are the governance and socio-economic vulnerabilities of south Asia's coastal cities intrinsically different from those of the region's non-coastal communities? How much does location matter in our understanding of vulnerability?

Governance and inequality. How can and should we understand existing urban and state responsibilities for the poor, underprivileged and disenfranchised in the context of climate change? How should we think about governance vulnerabilities as we contemplate climate hazards? How do our physical starting points – inequalities within the city, within the urban and peri-urban axis, and between cities and the state – intersect with our assumptions about vulnerable states and societies, politics and rights, and policies to address vulnerability and adaptation? Do evolving global paradigms of development and sustainability – and the consequent responsibilities of sub-national governance bodies to execute international development commitments – help or change our understanding of urban climate adaptation policies? If the quality of urban governance influences (or determines) the capacity to respond to climate change, how are (or might) climate-related vulnerabilities factor in altering governance?

The ambits of city and state. How should we understand the intersections of population growth and displacement, the availability of land and housing, the rights of individuals, groups, and communities, and the nature of governance in these contexts? In which ways has (and will) climate change transform the ways that coastal cities encounter their physical and governance environments? How will the anticipated phenomenon of mass displacement and migration challenge our accepted understandings of sovereignty and the protection missions of the state, the city and the community?

This brief discusses some of these questions as seen primarily from within south Asia's coastal cities. It looks at the idea of climate vulnerability in the context of other and overlapping urban and governance vulnerabilities that characterize these cities and the regions in which they live, and explores some of the many ways that vulnerability can be understood. It takes its cues from some of our workshop discussions, but does not summarize them; rather, it provides a broad look at the changing coastal urban experience, and particularly the changing understandings of their political economies in the age of climate change.

The Region as Context

Competition and contention are generally the bywords for inter-state relations in south Asia. Since the independence of India and Pakistan in 1947, and the subsequent independence of Bangladesh following war in 1971, cross-border engagement on most shared problems – whether through the region's only multilateral organization, the South Asia Association for Regional Cooperation (SAARC) or on ad hoc, bilateral bases -- has been weak, inconclusive, and rare. Wars over interests and ideologies have designed the political currency for the region, and armies have been the primary instruments for trans-border policy between India and Pakistan – and particularly with regard to the status of Kashmir, which is home to the headwaters of several shared rivers. Border conflicts and arguments about cross-border migration to both urban and rural areas (whether climate related or not) fuel hostilities between India and Bangladesh; competition between India and Pakistan regarding Afghanistan (whose rivers are also part of the region's contentious politics) has hardened attitudes toward one another as well.

Despite international efforts to join cities in common efforts to mitigate the effects of changing climates, south Asia's enormous urban centers cannot promise more than their central governments can guarantee.

Given this history, enmity is often assumed and anticipated among this group of sovereignty hawks: conflicts over borders, migration, water sharing and transboundary water management, regional autonomy, resource competition and external relationships therefore overshadow otherwise palpable policy concerns that affect the majority of south Asia's population.¹³ In a region in which the consequences of changing climates have been clear and critical for decades, the absence of cooperation is notable: a small number of bilateral agreements have been signed (if not respected), but SAARC, which some might have hoped would help to lessen insecurities among its members,¹⁴ has played virtually no role in any significant issues

facing the region; its occasional statements and declarations offer promises that are largely unmet.¹⁵

What does this tension mean for the region's coastal cities? Usually, national policies and practices provide the context for what is politically possible. Despite international efforts to join cities in common efforts to mitigate the effects of changing climates, south Asia's enormous urban centers cannot promise more than their central governments can guarantee. India and Bangladesh have taken climate change as a challenge, whether as impetus for globally mandated policy initiatives or to recast development policies (and without yet judging success); Pakistan, preoccupied with competing demands, still lags behind.

At the same time, the shared sensitive and fragile locations of the region's coastal urban centers, as well as critical and often conflicting maritime interests of their respective states are policy problems themselves: cross-border inter-urban cooperation on shared development conditions and circumstance, as well as political complexities in a range of policy arenas, are as yet undeveloped.

These arenas fall into several related categories: water scarcity and water sharing; land regulation and fiscal management; the overarching problematic of housing; shared conditions of extreme heat; the combined problems of urban and climate governance; and most notably in the popular imagination, predictions of mass migration from major coastal centers to destinations unknown. The region's reliance on monsoon rains for crops and water, its risk from floods, glacial melt and potentially sea level rises; the often fragile relationships between urban and agrarian areas; and the overall development conditions shared by the sheer size of these coastal cities underscore the delicacy and potential physical instabilities of these water-stressed cities.¹⁶ Each urban area is different, and each is governed differently; their common features, however, are based on similarly high levels of poverty, population growth and density that are challenging resource availability, occasionally idiosyncratic governance relationships to their states, complex urban governance arrangements, rapid growth and unstable environmental settings. In effect, the vulnerabilities of the region – climate,

political, economic, social and ecological – are multiplied in its coastal cities. The combined narratives of history and of climate vulnerability reflect not only the complexity of the region, but the challenges that urban development poses for the region itself. Indeed, the World Bank's South Asia prognosis suggests that "cities are where a significant part of the battle against climate change will be won or lost."¹⁷

Some of those battles, however, have long (pre-climate policy) histories within each city as well as between their respective states. Ethnic, sectarian, ideological and economic class tensions have afflicted some of south Asia's coastal cities for decades. Karachi, Dhaka, and Mumbai have long struggled with the combined effects of urban migration, partisan governance, and political cross-winds that inevitably have changed not only the character of these cities but their capacities to handle crises. All of south Asia's port cities still contend with their legacies of colonial mercantilism (as trade and development frameworks), post-colonial development choices, and the effects these have had on the relationships that cities have with rural areas, with the state, and with their own populations.

These circumstances are now part of the cities themselves: they are underlying conditions that affect their capacities to cope with urban civic disputes, tensions with the state, and outright conflict. Where climate factors generate risks for urban centers, these conditions comprise a list of longstanding vulnerabilities, and at the same time, new and different vulnerabilities for the broader state and society.¹⁸

Understanding Vulnerability in the Context of Coastal Climate Change

Coastal urban south Asia confronts a multitude of challenges that epitomizes our understanding of complexity. The climate threats that seemingly unite them also distinguish them: all reside along seas that are rising – but not in the same ways or at the same pace; they all confront the effects of variable monsoons, but live in substantially different climactic zones. At the same time, the non-climactic hazards

they encounter are also similar and different: they are comprised of multi-class, multi-ethnic populations, but their societies and political economies are quite different. The ways that climate change intersects with pre-existing governance vulnerabilities, therefore, can differ as much as they resemble one another: as a result, the views of those responsible for urban planning, larger-scale development policies, and governing – while often united in their general diagnoses of vulnerability – can differ substantially in locating the unit(s) of analysis with which they work.

The starting points for study and the end points for policy therefore move between and among individuals, communities, national regions, states, geographic and political regions and eco-systems.¹⁹ These are essentially problems of politics and governance; they are not unique to south Asia's coastal cities, or even its urban centers writ large. But where to start and finish also depends on the focus of disciplinary concern: looking at cities from the perspective of a planner may well differ from the initial vantage points of poverty, or of natural systems. Climate includes all of these and more, and together, these concerns underscore two related puzzles that are shared across the region: complicated questions of scale (of analysis and prescription), and the overall problem of complexity. The juncture of the two is already apparent in the ways that these cities are attempting to cope and plan. Almost every governance initiative – ranging from political representation to the building of dams to complicated water-sharing arrangements – spurs a feedback loop that can exacerbate basic climate stresses, on the one hand, and on the other, challenge the fundamental responsibilities of states and societies.

In these senses, they highlight an enduring element of complexity (and by extension, complex emergencies, even in their nascent stages): no single narrative encompasses the trajectories of development, governance and climate-related stresses, and the starting point – vulnerability – is as complex as the end points of policy prescription.

Several examples help to illustrate the tangled problems of coastal urban climate complexity: land and housing, heat, water, and poverty. Each, in turn,

illuminates an aspect of the complex governance of the region's coastal cities.

Climate-related Contextual Vulnerabilities

Heat. South Asia, like the Gulf states and neighboring states in southeast Asia, is an epicenter of heat and heat waves. Its urban centers live, literally, at the core of this problem: the region's cities are enormous, their populations grow exponentially and live in densely built, often poorly constructed neighborhoods, and their physical infrastructures combine urban sprawl with intense vertical growth. The resulting urban heat islands raise temperatures even more; increasing temperatures are breaking records and making some areas unfit for human habitation.²⁰ In cities like Karachi, a coastal city that registers among the highest urban heat indices in the region, limited access to electricity as a result of private ownership of power generation has increased substantially the vulnerability of the poor to rising temperatures. In addition, the city is surrounded by desert-like conditions in the province of Sind which, like neighboring Rajasthan in India, is experiencing increasing temperatures; this in turn has provoked a rise in rural-urban migration before conditions in the metropolis have improved.²¹

Water. Each of the region's coastal cities is dealing with several water-related problems at once: some are located downstream from rivers that are alternately dry or flooding; all are affected from variable monsoons that not only produce drought or floods, but also seriously compromise the availability of food as well as water; these upstream-downstream problems already produce tensions with neighboring communities and in the case of the Indus River, with neighboring states²²; some are experiencing high rates of salinity that affect persons and crops alike; and rising sea levels are accompanied by storm surges that are likely to increase, and thus threaten the physical structure of the cities themselves.²³ Moreover, those that experience dramatic shortages of potable water live at the sharp edge of two problems: the absence of water, and the corruption of the water distribution system (similar to, and intersecting with, corruption in land use and ownership). Water shortages

impact wider climate conditions as well: shortages of water limit its availability for hydropower, forcing continuing dependence on carbon based energy, with its negative effects on climate change.

Land and housing. The centrality of land (and water) to coastal cities is hard to overstate, not only as the space on which urban growth depends, but as a corollary, as the repository of property rights and practices as well.²⁴ The development of large (and now megacities) across south Asia reflects the region's changing views of the role of its urban centers, and the place that many of them hold in complex national and regional politics.

Land can be valued for the benefit it provides to individuals and specific communities, and it can also be valued as an element of the city's wealth and endowments. Clearly, these different assessments can conflict. In cities like Mumbai, where global ambitions are now accompanied by profound private wealth, tensions with the poor residents of lands now ripe for redevelopment involve not only private actors keen for profit but a city government keen for tax revenues and an international profile.²⁵ The choices made by public actors on behalf of different constituencies within the city can be stark: global investment in new economies can benefit the city as a whole in one way; jobs for the poor can benefit it another. In both cases, the grounds for dispute are in public choices about private enterprise and the profile of the property that is to be used, as well as about what counts as a global, modern, forward-looking urban environment.²⁶

Urban land markets in many cities in south Asia have become under-regulated speculative frontiers. This phenomenon (or perhaps, condition) has arisen for several reasons: increasing population size has led to scarcity of property and tremendous competition for land; complicated governance arrangements and pervasive questions about the locus of responsibility for ensuring rights to property and due process have led to administrative fragmentation; and corruption has led to profit-seeking on the part of officials, often by permitting development in proscribed areas. These three trends have, over the course of many decades, not only provided an environment without effective regulation, but served to enrich the few while

impoverishing the many, all the while imperiling the ecological safety, security and viability of the urban landscape.

As a result, land markets are inefficient: transactions can occur without legal codification, without complying with strategic development plans, and without guarantees of independent legal recourse for transactions that go awry. Construed as economic inefficiencies, such conditions raise transaction costs, which are then passed on to housing consumers (renters or buyers). This process, in turn, has created housing markets that are similarly unregulated, speculative, often out of reach for the poor and working classes, and environmentally risky.²⁷

Construed as political conditions, these environments of land speculation do not meet the needs of poor and working class urban residents, who can count for more than half of the population in some cities. As a result, they find dwellings within the city that are generally described as "informal," in communities that are equally unregulated. Many of these informal settlements are located on ecologically sensitive and/or risk prone land, already deforested and comprised of in-filled wetlands, lakes, river banks and drainage channels, or landfills – all places where natural drainage systems are compromised by congested, unregulated and dense settlement.²⁸ Paradoxically, those who live on these lands (for lack of alternatives) are sometimes treated as encroachers, and blamed for flooding.²⁹

The alternatives to inner city residency are often no better: for lack of options in the city, residents of south Asia's large coastal cities are often pushed to settlements on the urban periphery. Land is cheaper, but development spills onto ecologically sensitive or important agricultural land. Similar processes of environmental degradation affect land-locked cities as well, but the vulnerability of the coasts – combining ecological and man-made hazards – can threaten its cities profoundly.

Both inner-city and peri-urban environments can therefore compromise the sources and distribution of food: whether by appropriating former agricultural lands or altering agricultural markets, this adds



another dimension of insecurity to the broader landscape.³⁰ The combined effects of unregulated land and housing markets establish patterns of settlement that therefore endanger the economic viability of these cities, create conditions for cyclically inadequate and/or inappropriate governance, and imperil the safety of residents as well as the environmental conditions needed to sustain burgeoning populations.

Spatial distribution: informality and vulnerability.

What counts as a city, and who counts as living in a city in south Asia, continues to change.

The many ways that urban development patterns affect and are affected by their regional ecosystems and resource sheds extend well beyond formal urban boundaries. Resource flows that sustain an urban area – including people, goods, jobs, finance, food, water, energy – do not originate exclusively in, and are not exclusively produced and consumed within that same area; many of the goods, services and waste generated in a city will eventually flow out of the city limits.³¹ These cities are thus inevitably situated in essentially transboundary physical, capacity and transactional settings.

In south Asia, including its large and growing coastal cities, urban sprawl has, in many ways, come to define a new kind of city: enormous informal settlements now surround most of the region's large cities, and the urban environments attached to coastal cities now encompass a vast landscape of unplanned settlements defined by informal systems of management, resource allocation, and infrastructure.³² Those built on floodplains – essentially, those attached to coastal cities – are increasingly vulnerable to inundation, storms and a wide array of climate-related hazards, due to their locations and more critically, to the absence of regulation and oversight. These settlements, which bridge the urban and rural, often live outside the ambit of governing by city or state – and increasingly turn the absence of government into a form of mal-governance that exacerbates the potential effects of climate change on the city as a whole, and its residents.

In a sense, these informal settlements also redefine the nature of rural-urban migration in a climate-stressed

environment.³³ Where climate-related disasters occur – as well as other displacement phenomena that arise from human intervention in the environment -- migration to cities is almost inevitable. As the boundaries between rural and urban blur, the question of who is responsible for taking decisions about human and ecological welfare becomes distorted as well. By implication rather than design, the ambit of the state and the city has been redrawn to accommodate migration and population growth.³⁴

The ubiquity of informality alters the physical, psychological and political foundations for urban governance in ways that underscore the fragility of city dwellers and potentially, of the city itself.³⁵ Politically and economically powerless populations are victims not only of rising transaction costs but of weak legal guarantees – not only with regard to their housing choices, but the overall support for their rights. Those with marginal security to land and housing are rarely protected by the state (or the city) in any other ways as well. If access to habitat is insecure, access to justice is often even weaker: informality generally exists outside the protections of the law.

An urban environment that is built on personal relationships (whether benign or malign) rather than equity and equality before the law is vulnerable by definition. While an argument can be made that financial relationships built around kinship (to purchase housing, for example, as can be the case in ethnically segmented megacities) provide access to resources that would otherwise be absent, these relationships are built on a deep governance fault line. They often exist outside the law, and reinforce the status of informal settlements as communities whose existence – and residents – are bound by extra-legal processes. For the most part, these populations are not accounted for in official statistics: informal agreements are not codified or registered, leaving residents hard pressed to claim services or protection. Coastal south Asian urban areas – including places not considered within the legal boundaries of the city – can be literally “ungoverned spaces,” and the absence of data – whether collected by state or non-state authorities, whether about land or the legal status of migrants -- reinforces this status. The absence of deeds of sale, title

and property delineation is a problem under the best of circumstances; in areas affected by climate change, floods, typhoons, changing river banks and erosion, rights to residence are grounded in luck rather than legal practice.³⁶ For the landless poor, these problems are multiplied many times over.

Climate-related Structural Vulnerabilities

The twinned problems of poverty and inequality, on the one hand and on the other, challenging urban governance – often located within states that themselves find governing to be demanding and often unresolved – form a backdrop to climate stress in and among coastal cities in south Asia. These problems are closely related; indeed, they describe two sides of the same problem: political economies whose limited collective adaptability to plan for, or respond to, climate hazards become a vulnerability all its own.³⁷

Decisions about where and how the poor live – whether by governing agents, land developers, or social groups seeking habitat and/or community – can have the effect of turning the built (as well as natural) environment against the populations it might otherwise be meant to serve and protect.

These structural vulnerabilities differ across the region and its cities, and highlight three intersecting facets of vulnerability: first, development and political situations that exist independently of climate change, but are exacerbated by and qualify the ways that coastal cities can respond or adapt to changing environments; second, political choices that frame the scope of possibilities for vulnerable populations living in climate-stressed environments; and third, the problem of the city as a whole – that is, as an entity whose diverse populations and encompassing infrastructure set conditions for the ways it can respond to climate change.

Poverty and inequality. Development and relief

organizations often focus on the tangible and exceedingly important effects of climate change on vulnerable populations and by extension, on the phenomenon of urban poverty.³⁸ It is nonetheless useful to reverse this dynamic in order to look at the effects of urban poverty and inequality on climate impacts in coastal cities. These two elements of social vulnerability³⁹ often determine the ways that urban populations are able to respond to changing climates – whether as a measure of access to water, ability to limit heat exposure, recover from floods and droughts, or secure safe housing. They also describe and to some degree explain the ways that the region's coastal cities understand their viability in the face of significant threats to their futures.

These problems have been identified in non-climate contexts as infrastructural violence.⁴⁰ Decisions about where and how the poor live – whether by governing agents, land developers, or social groups seeking habitat and/or community – can have the effect of turning the built (as well as natural) environment against the populations it might otherwise be meant to serve and protect. Whether this occurs as a result of deliberate decisions, or is a consequence of the treatment of the poor and underserved overall – actively or passively – the resulting urban environment injects hazard, risk, and uncertainty to those with little voice or access to power. While appearing to limit the scope of government concern by removing poor populations and poor neighborhoods from the city's concern, they concurrently create new vulnerabilities for the overall human and urban environments.⁴¹

Under prevailing and potentially future climate conditions, coastal urban populations live at the cusp of potential environmental-political emergencies.

This is often the situation in which the urban poor find themselves in south Asia: enormous populations that seem to have become isolated from the concerns of the state and/or the city, often profoundly ill-attended by governments that omit them from social services, and living in places that are therefore physically fragile and politically divided. These situations are at once graphic reminders of the fragile environments in which the

urban poor live, and their tangential relationships to their own cities, neighborhoods, and social groups.

To the degree that the city is the primary governance unit responsible for its citizens, residents and (given the mobility that is an intrinsic element of climate change) migrants, these conditions themselves are vulnerabilities of the city, independently and in coordination with the state.⁴² Even more important, they highlight the fundamental problem of governance in ecologically, politically, economically and socially complex settings: the diffusion of responsibilities in cities, and for the urban habitat, leaves open the question of how changing climate either accepts or alters the assumptions on which the poor are governed.

Governance. Just as famine and floods result from multiple causes, and multi-dimensional poverty is exacerbated by multi-dimensional climate change, so the everyday risks of urban vulnerability can multiply the nature and prospects for disasters and emergencies. These, in turn, can be (and generally are) exponentially increased by poverty and complicated (and often weak) governance. Many of the factors discussed here are shared by coastal cities across the region. Others – including violent political competition laced with economic corruption – are typical of some but not all the major coastal cities. Under prevailing and potentially future climate conditions, however, all live at the cusp of potential environmental-political emergencies. Floods have already been at the locus of national conflict in Dhaka; ethnic and class rivalries have long formed the fault lines of conflicts over access to potable water, and separately, access to sea and land for fishermen in Karachi.

These dynamics effectively limit the capacity to adapt to even minimal disruptions – whether economic, political, infrastructural or climate-driven – and thus help to identify the many vulnerabilities of the urban poor, and for the city as a whole. Whether they are viewed as characteristics of development or political processes, they point to incremental failures of the state to govern equitably; these slow onset conditions underscore the region's deep inadequacies in confronting the searing effects of climate change.

Structural Vulnerabilities Meet Climate Vulnerabilities

Both endemic poverty and stressed governance (which at times has led to fragile, if not failing states in south Asia) can be construed as urban structural vulnerabilities: both are built on deliberate policy choices by states (and in some instances, their citizens) about power, authority, and finance, as well as exit, voice and loyalty. Both have led to palpable changes in the scale and functioning of the region's coastal cities and the dimensions of the problems they are now expected to confront. In the context of climate change, they meet in three climate-related areas that are of paramount concern to the region's urban centers: disasters, migration and rights.

Reducing the risk of disaster raises not only questions about water, food, land and environmental management, but of development policy, urban planning, social organization, political processes and state capacity for the entire region.

South Asia has long been tested by its vulnerability to earthquakes, floods and droughts, as well as their aftermaths – deaths, dislocation, displacement, disease, food insecurity, property and financial loss, and political uncertainty. In some areas, these are almost regular occurrences – everyday risks, in a sense – but rising temperatures have raised these risks and stakes for droughts – in the Thar (Pakistan)-Rajasthan (India) desert, for example⁴³ – and floods along the Indus River in Pakistan, and along the Bangladesh coast. As with most disasters, they give rise to immediate and longer-term effects: rehabilitation, and temporary resettlement or relocation is now augmented by permanent migration, often to major cities. Not only affected areas, but urban resettlement locales have become solutions for some of the problems, and as such, part of the overall vulnerability problem itself.⁴⁴ Reducing the risk of disaster raises not only questions about water, food, land and environmental management,

but of development policy, urban planning, social organization, political processes and state capacity for the entire region.

The contexts within which climate change is viewed in south Asia raise the governance stakes in other, potentially profound ways. While urbanists may focus on the city as a destination for climate-related migration – as it often has been – the pace of climate change and the vulnerabilities of these cities suggests that it is urban residents who may well be forced to move. Patterns of sea level rises, inundation and salinization, floods and droughts, combined with population growth and land resource shortages in and around these coastal cities can fundamentally alter the prospects for disaster mitigation, and therefore, raise the attractiveness of semi-permanent migration. This could take two forms: cross-border migration within the region, and/or migration out of the region.

Neither prospect is easy to imagine, and both are as yet rarely discussed across the region, whose already hard borders reinforce the combined effects of resource shortages, poverty, political divisiveness and social differences within coastal cities: Bangladeshis are not welcome in India, Pakistanis and Indians rarely have an easy time crossing to the neighboring state. The close locations of Mumbai and Karachi, or Dhaka and Khulna and Calcutta – similarly situated, and potentially afflicted in some similar ways -- have not yet made these relationships closer, and the size of their populations would represent a daunting challenge to any receiving state.⁴⁵

The curated animosity of the region's most populous states toward one another has colored their capacities to act together, or in coordination.

The same could be said about migration out of the region. South Asia is bounded to the north by some of the world's highest mountains; and central Asia's climate and resources are unequal to the task of providing safe harbor, and China's plans for climate change and urban development are not set to take

account of in-migration, and certainly not from the south. South Asia's neighbors to the east are as crowded, and vulnerable to climate effects, as its own states and cities; setting out to sea toward Gulf states facing comparable conditions is equally unlikely. Each prospect could create a complex emergency of considerable magnitude.

It may be more likely that the short-term effects of changing climates will produce a steady out-migration from or through its coastal cities. While this would seem to avoid the rapid onset of a catastrophe, there is little to suggest that this slow-onset disaster would be a sustained process for which the region's cities and states are prepared. Even if this were to resemble a "new normal," it would reflect the same problems of governance capacity and concomitant weakness of rights protections among urban citizens and migrants. Indeed, these phenomena can raise the profile of rights concerns to a level that matches, and possibly surpasses, the complex determinations of rights claims and protections that has long permeated conflict arenas: the postwar consensus on rights protection for migrants, increasing challenged under circumstances of violence and failing states, is under greater stress in the multiply-caused conditions of climate migration (for which legal instruments for protection are still in the infancy). However limited rights guarantees may be for the most vulnerable of urban residents now, there are as yet few if any concrete rights protections for them as climate migrants within their own states, or when they cross national borders. These are global and national problems, without a doubt; at their root, they reflect the many conflicting ways that governance responsibilities have been understood by politicians, entrepreneurs and citizens.

Coastal cities, and their people – urban vanguards, individually and collectively – offer us prospective lessons in history and humility. The same cities that have created exceptional wealth and anchored south Asia's global presence have struggled to protect the poor, respect urban ecology, and govern themselves equitably in the face of changing climate. In this sense, the climate vulnerability of south Asia's coastal cities is, fundamentally, the many hued, complex vulnerability of its urban governance.

Draft Conference Papers

Zafar Adeel: Untangling the Water-Energy-Food Nexus in South Asian Coastal Megacities

Nausheen H. Anwar: Vulnerability in South Asia's coastal cities: some reflections on Karachi

Kamran Asdar Ali: Karachi and the Anthropocene: Notes on political choices

Solomon Benjamin: Contested Spatialities of Climate Change: A return to Land

Jason Cons: Navigating Inundation

Vinita Damodaran: Historical climate vulnerability in South Asian Cities

Rupali Gupte: Ecologies of Work

Arif Hasan, Arif Pervaiz, Mansoor Raza: Drivers of climate change vulnerability at different scales in Karachi

Iftekhar Iqbal: Migration to Dhaka: Revisiting Climate Factors

Garima Jain, Amir Bazaz, Teja Malladi: Understanding the outcomes of risk related resettlement in Indian coastal cities

M. Hafijul Islam Khan: Climate Change Induced Migration and the Legal and Policy approaches for Relocation and Resettlement in Urban Cities in Bangladesh

Mathangi Krishnamurthy: Water-Worlds: Image and Representation in the Chennai floods 2015

Sohail Jehangir Malik: Pakistan: Coastal Cities, Urban Agglomeration, Poverty and Food Security

Paula R. Newberg: Exploring State Vulnerability and Climate Change. Governance as Vulnerability: Preliminary Lessons from Pakistan

Umamaheshwaran Rajasekar, Soumita Chakraborty and Gopalkrishna Bhat
Climate Resilient Smart Cities: Lessons from Initiatives of the Indian Government

Asad Sayeed: Conflict, Informality and Vulnerability in Karachi: Implications for Addressing Climate Change Issues

Ali Tauqeer Sheikh, Bilal Khalid, Irum Hamid: Heat Management Planning in South Asia

Endnotes

¹ <https://theoutline.com/post/1959/drowning-cities>

² Identifying urban areas is a challenge. The World Bank estimates that urban areas account for 30.9% of the region's total population, and that 130 million people in south Asia live in informal (and often uncounted) settlements; the urban population is projected to rise by 250 million by 2030. See *Leveraging Urbanization in South Asia*: www.worldbank.org/en/region/sar/publication/urbanization-south-asia-cities. In broader context, the Asian Development Bank projects a possible 64% of Asia as a whole will live in urban settlements by the year 2060 and estimates that India will be home to four more megacities – Chennai, Bangalore, Hyderabad and Ahmedabad. See *A Region at Risk: The human dimension of climate change in Asia and the Pacific* (ADB 2017). In the region's twelve largest cities, peri-urban areas can exceed the population living within official municipal boundaries, blurring the boundaries between rural and urban environments in ways that are generally not reflected in official statistics. See also Mark Roberts, "South Asian Urbanization: Messy and hidden," blogs.worldbank.org/09/20/2015, as well as the workshop paper prepared by Sohail Malik.

³ See conference paper by Nausheen Anwar.

⁴ The impacts of climate change on cities can be measured in many ways, including fiscal health. For example, in 2013, Nature Climate Change identified Mumbai as among the top five coastal cities at risk from flooding, as measure not by population or area, but by projected economic losses.

⁵ Floods in Chennai in recent years, for example, have spurred discussions about the relationship between climate change, industrialization and urbanization policies, and the history of localized environmental decision making. See "The flooding of Chennai: Urban India and Climate Change," 31 January 2016: www.geolounge.com/the-flooding-of-chennai-urban-india-and-climate-change/. See also V. Vasudena, "Unregulated urbanization to blame for Chennai flooding: CSE experts," *The Hindu*, December 2015; and conference papers by Mathangi Krishnamurthy, Rupali Gupte and Garima Jain et al.

⁶ See Aidan White and Mark Whitehead, "Cities, Urbanisation and Climate Change," *Introduction to Urban Studies* at 50, 50(7) 1325-1331, May 2013.

⁷ For India, see Kathleen Bush et al, "Impacts of Climate Change on Public Health in India: Future Research Directions, *Environmental Health Perspectives* 199, 7650770 (2011): <http://dx.doi.org/10.1289/ehp.1003000>

⁸ Climate & Development Knowledge Network, *The IPCCs Fifth Assessment Report: What's in it for South Asia?*: <https://cdkn.org/resource/highlights-south-asia-ar5> (2014), p. 75.

⁹ The relationships between pre-existing conditions, exacerbated conditions and new conditions, which differ among locales, poses particular challenges to urban governance in states and cities that are already conflicted, divided and poor. See conference paper by Arif Hasan et al.

¹⁰ Climate research and policy, as highlighted by Amartya Sen as well as Alankar, lacks a unified normative framework, and this absence is reflected in disciplinary discussions of vulnerability that are often at odds with one another. See Sen, "Global warming is just one of many environmental threats that demand our attention," *The New Republic*, 22 August 2014; and Alankar, *India's Megacities and Climate Change: Explorations from Delhi and Mumbai*, STEPS Working Paper 2015 (STEPS Centre, University of Sussex, Brighton).

¹¹ The workshop did not discuss the specifics of climate change as it has affected south Asia, except to reference its primary effects. Instead, the phenomenon of climate change was the starting point for a discussion of vulnerability and its relationship to climate change, with less attention to adaptation, mitigation or resilience.

¹² A list of participants and papers is appended to this Brief; authors can be contacted directly.

¹³ See Gareth Price, *Rethinking Water-Climate Cooperation in South Asia*, Observer Research Foundation, ORF Issue Brief No. 130, March 2016, and Nick Langton and Sagar Prasad, "Will Conflicts Over Water Security Shape South Asia's Future?" Asia Foundation and Center for Strategic and International Studies, 21 March 2012.

¹⁴ See Mandakini Devasher Surie, "Desecuritizing Transboundary Water in South Asia, Asia Foundation," 17 September 2014.

¹⁵ See the Dhaka Declaration and SAARC Action Plan on Climate (2008), Delhi Statement on Cooperation in Environment (2009), Thimphu Statement on Climate Change (2010) and others.

¹⁶ See World Bank, *South Asia: Shared Views on Development and Climate Change*, chapter 14: *SAR_Climate_Change_Full_Report*, November 2009.pdf.

¹⁷ *Ibid*, p. 175.

¹⁸ There is a growing literature on the relationship between climate disaster and inter-societal conflict; while much of it is speculative, it does highlight the inherited (and perhaps curated) fragility of the states and cities that are most at risk from climate change. As one example, see C.F. Schleussner et al, “Armed-conflict risks enhanced by climate-related disasters in ethnically fractionalized countries,” *Proceedings of the National Academy of Sciences (Early Edition, EE)* [DOI: 10.1073/pnas.1601611113].

¹⁹ While our approach focuses on governance, Okpara et al describe “different portrayals of vulnerability” among disciplinary and policy discourses with regard to climate security and conflict. Their understanding of contextual vulnerability rings true in both arenas. See U.T. Okpara, L.C. Stringer, A.J. Dougill, “Perspectives on contextual vulnerability in climate conflict, *Earth Systems Dynamics* 7, (2016) 89-102.

²⁰ See conference papers by Sohail Malik and Ali T. Sheikh et al, as well as Asian Development Bank: *A region at risk: the human dimensions of climate change in Asia and the Pacific* (2017).

²¹ See conference papers by Asad Sayeed and Arif Hasan on the range of factors that increase Karachi’s vulnerability.

²² See conference paper by Zafar Adeel, as well as Zafar Adeel and Robert G. Wirsing, eds., *Imagining Indus: Overcoming Water Insecurity in the Indus* (Springer, 2017).

²³ See conference papers by Iftekhhar Iqbal and M. Hafijul Islam Khan

²⁴ See conference paper by Solomon Benjamin, Rupali Gupte, Mathangi Krishnamurthy and Asad Sayeed.

²⁵ S. Ravindran, (2014). “Mumbai will likely flood again—and no one is doing much about it.” *The Guardian*, November 27, 2014.

²⁶ See conference paper by Rupali Gupte; and Renn, A. (2012). “What is a Global City?” *New Geography*, December 7, 2012.

²⁷ See Asad Sayeed, Khurram Husain, Syed Salim Raza, “Informality in Karachi’s Land, Manufacturing and Transport Sectors: Implications for Stability,” *Peaceworks* 114 (May 2016), United States Institute of Peace

²⁸ See conference paper by Iftekhhar Iqbal, particularly regarding the complex phenomenon of flooding and drainage in Dhaka; similarly, the conference paper by Vinita Damodaran on the multiple causes and effects of famine; and the conference paper by Sohail Malik on the problem of environmental mismanagement. Some of these problems are not exclusive to slums or informal settlements; but the effects on poorer communities are deeper, and the resulting ecological consequences are much harder to limit.

²⁹ These phenomena are not solely the result of speculation and unplanned growth; they also arise from the assumptions about planning that have characterized many of the region’s cities since the end of colonial rule. See conference paper by Mathangi Krishnamurthy for a discussion of natural water bodies, floods, and drainage.

³⁰ See conference paper by Sohail Malik, citing the Planning Commission of Pakistan on the risks of peri-urban settlements, including the degradation of urban ecology, and challenges to governance.

³¹ See Ramaswami, A., Weible, C., Main, D., Heikkila, T., Siddiki, S., Duvall, A., Pattison, A. and Bernard, M. (2012), “A Social-Ecological-Infrastructural Systems Framework for Interdisciplinary Study of Sustainable City Systems.” *Journal of Industrial Ecology*, 16: 801–813.

³² See conference papers by Nausheen Anwar, and by Umamaheshwaran Rajasekar et al.

³³ See conference paper by Iftekhhar Iqbal.

³⁴ See Farhan Anwar, “The city without a government,” *The Friday Times*, 21 July 2017; see also conference paper by M. Hafijul Islam on the loss of social coherence and community resilience under such circumstances.

³⁵ See conference papers by Nausheen Anwar and Asad Sayeed.

³⁶ See conference paper by M. Hafijul Islam Khan on loss and damage in Bangladesh. For those living in conflict environments – including some of the cities discussed here – there is often suspicion about the use of data by authorities, particularly those considered to be partisan. This is a governance problem across the board, a structural rather than contextual vulnerability; it is no less important, and speaks to the broader problems of the state rather than exclusively to the challenges of urban settings. In addition, the absence of data in some states, and little agreement about what counts as appropriate data (for the purposes of climate change policy and other regional problems) among these neighboring states is a barrier to cross-border cooperation – itself a form of regional vulnerability.

³⁷ See conference paper by Sohail Malik concerning Karachi.

³⁸ See, for example, footnote 2 above; and World Bank, *Dhaka: Improving Living Conditions for the Urban Poor*, Bangladesh Development Series Paper 17 (2007).

³⁹ See conference paper by Anwar for a discussion of the material, institutional and attitudinal factors that comprise social vulnerability in Karachi.

⁴⁰ See, for example, three related articles in the 2012 special issue of *Ethnography* 13,4: D. Rodgers and B. O'Neill, "Infrastructural Violence: Introduction to the Special Issue," 401-412; N. Anand, "Municipal Disconnect: On abject water and its urban infrastructure," 487-509; and J. Ferguson, "Structures of Responsibility," 558-562. Their treatment is derived in part from the concept of structural violence, beginning with Johan Galtung, "Violence, Peace and Peace Research," *Journal of Peace Research* 6,3 (1969), 167-191.

⁴¹ See conference papers by Solomon Benjamin and Mathangi Krishnamurthy on land and development assumptions concerning flooding in Chennai and Bangalore.

⁴² See conference paper by Garima Jain et al, on the intersections between rehabilitation and resettlement (under conditions of everyday risk and of disaster risk), including the effects on the city and its population of relocating vulnerable populations. The relationship between everyday risk and disaster risk, and climate and non-climate related causes of vulnerability, and rapid and slow onset climate problems is explored sequentially by Garima Jain et al, Iftekhar Iqbal, and Hafijul Islam Khan.

⁴³ See "Pakistan's Thar residents living on edge: In the southeastern desert, a reported 'famine' appears to be another name for structural poverty on an extreme scale," *Al Jazeera*, 16 March 2014; and Colin Shultz, "Climate change is already causing mass human migration: When temperatures are high, Pakistani men are 11 times more likely to move out of town," *Smithsonian.com*, 29 January 2014.

⁴⁴ See conference paper by Garima Jain et al on the problems of viewing disaster risk reduction in isolation, and concomitantly, the difficulties that arise from treating it in isolation. As background as well, see UNHCR, Brookings Institution and Georgetown University "Planned relocations, disasters and climate change: Consolidating good practices and preparing for the future," Background document, San Remo Consultation, 12-14 March 2014; Asian Development Bank, *Addressing Climate Change and Migration in Asia and the Pacific: Final Report*, 2012; Susan Martin, "Climate Change, Migration, and Governance," *Global Governance* 16,3 (July-September 2010) 397-414.

⁴⁵ Neither India nor Pakistan nor Bangladesh has acceded to the 1951 Convention on Refugees or its 1967 Additional Protocol. The United Nations Guiding Principles on Internal Displacement apply only to population movements within states, not between them; parallel guidelines concerning cross-border climate displacement have been discussed for many years, but have yet to be finalized.

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