

Chapter 6

Transformations of Urban Coastal Nature(s): Meanings and Paradoxes of Nature-Based Solutions for Climate Adaptation in Southeast Asia



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Significance Statement This chapter puts into conversation two distinct yet inter-related planning visions – *Blue Urbanism* as a movement in its own right, driven by the overarching promise of more meaningfully reconnecting coastal cities with their marine ecosystems, and *Nature-based solutions*, with roots in engineering that encompass a broad range of conservationist and infrastructural interventions rooted in Euro-American sensibilities around (urban) nature. Drawing on urban Southeast Asia for inspiration, namely Jakarta, Metro Manila and Singapore, the chapter unpicks dominant understandings of “nature” within its concomitant planning paradigms. Particular attention is placed on divergent meanings and contradictions that underpin how urban coastal nature(s) are materially imagined, reproduced and contested through often technical means, utilitarian value-systems, and modes of governing adaptation in its broadest sense.

Keywords Coastal adaptation · Nature-based solutions · Blue urbanism · More-than-human geographies · Infrastructures

1 Introduction

Cities all around the world face increasing risks from the impacts of global climate change, with larger urban agglomerations in the coastal zone being especially threatened by rising sea levels, heavy rainfall events and a growing occurrence of storm surges. Besides international efforts to mitigate greenhouse gas emissions, political initiatives to foster adaptation are gaining traction, usually with a strong emphasis on urban areas as both being most affected by projected changes, as well as

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being potential change agents that can pro-actively initiate positive transformation and trigger innovation. In recent years, approaches have been developed within the adaptation and wider urban development debates that call for more sensitive approaches to the specific conditions of coastal locations and propose an ecologically inspired planning culture. Of those approaches, Blue Urbanism stands out as a planning philosophy that tries to reconnect coastal cities to their marine environment and overcome the ‘ocean blindness’ of urban development processes over recent decades. Coming more from an engineering background, the debates on nature-based solutions follow on from these considerations in that they call for an orientation towards ecosystems and their services in order to achieve desired goals of adaptation and resilience enhancement. This is to be achieved, for example, through the protection of existing ecosystems, or the mimicking and integration of certain desirable ecosystem functions into more traditional engineering approaches. In this article, we will review some of the recent debates that are led in those emerging trends of urban coastal development, coastal protection and sea level rise adaptation. Drawing from examples and projects in Southeast Asia, we will evaluate those discourses, especially trying to understand the dominant understandings of “nature” in those planning ideas, and which manifestations of “the natural” are envisioned in them.

2 Preparing Coastal Cities for Climate Change – Towards Blue Urbanism?

With the introduction of the term “blue urbanism”, Timothy Beatley (2014) has channeled an increasing attention for the “blueing” of cities (rather like their planned greening), recently picked up in notions such as “conscious coastal cities” (Mega, 2016) and blue-green urbanities (Assmuth et al., 2017). Starting from the observation that many of the world’s metropolises have historically developed in deltaic and other coastal spaces, Beatley notes that those cities and their inhabitants have lost their social connection to the sea and the oceanic realm. For overcoming this “ocean blindness”, he proposes various ways in how to re-establish ‘feelings of connectedness’ that not only impact on how those cities mitigate and adapt to changing sea levels and extreme weather events, but also put into question the current paradigms of urban development and everyday life, together with their concomitant practices of production and consumption. Besides his calls for novel ways of being urban(e) in the form of a transformation of urban citizenry into what he terms as the *homo aqua urbanis* – crosscutting most aspects of everyday life in coastal cities – Beatley postulates the need for tangible economic transformations that embrace benefits that the urban maritime offers, from new recreational parks and tourism facilities, to infrastructures of maritime energy generation (i.e. tidal power, gas extraction), to new forms of urban transport or marine-based food production like aquaponics, and “community-supported” fisheries.

We have argued elsewhere (Siriwardane-de Zoysa & Herbeck, 2020) that despite some legitimate points, the way in how Beatley spells out his call for a more integrative character of urban coastal development processes obstructs the view on the lived realities of coastal dwellers with their own agency of adapting to changing (environmental) conditions. In his strict concentration on city governments as the major actors of coastal transformations, the term is not able to grasp the multitude of perceptions and the contestations towards top-down development processes. Additionally, the treatment of marine ecosystems appears mainly as being unflinchingly utilitarian and resource-centric. Another concept, that promises to entail a more nuanced understanding of “nature” and to give way to integrating ecosystems in their own right into adaptation processes is the idea of nature-based solutions.

3 Nature-Based Solutions – What Nature? Whose Solutions?

Although not in direct conversation with the works on blue urbanism, the relatively new discussion on nature-based solutions (NBS) in climate change adaptation resonates well with some of the assumptions depicted above. Created and made accessible to a wider public at a similar time, NBS have been gaining visibility and are increasingly proposed as alternative to grey infrastructure development in many areas over recent years. With regards to climate adaptation (and often also to the synergies between adaptation and mitigation), NBS are considered to be at least a potential complementary to traditional engineering approaches (Kabisch et al., 2017). For coastal cities, the term suggests a number of more or less established measures, reaching from mangrove and wetland restoration, to sediment management and river re-naturalization, to the protection and development of rainwater retention capacities, to different forms of green urban design (cf. Fig. 6.1).

Facilitated by an expert group under European Union’s Horizon 2020 program, the basic guidelines for the debate were published in a report by the European Commission in 2015 (EC, 2015) and have since made wide circles, both in the political-administrative and the engineering sphere. Being a European (and Euro-centric) debate in its very origin (cf. Bridgewater, 2018) NBS quickly found its way to global policy levels and has developed into one of the most influential debates on climate change adaptation in face of unknowns and unknown-unknowns of climate change, with a current focus on small-scale projects and their potential for sustainable and cost-effective risk reduction.

The debate on NBS does not come from nowhere: Ruangpan et al. (2020) show that considerations of alternative approaches to established engineering approaches go back to the late 1970s and the debates on low impact development. Since then, various concepts have been used to call for “greener” and more sustainable solutions to urban problems, with different emphases. For example, in the context of the UNDRR’s Sendai Framework for Disaster Risk Reduction 2015–2030, the term



Fig. 6.1 Nature-based solutions for climate adaptation in coastal cities. (Own illustration, based on <https://www.nature-basedsolutions.com/>)

ecosystem-based disaster risk reduction is used, while the Convention on Biological Diversity uses *ecosystem-based adaptation* to address synergies between biodiversity protection and climate change adaptation (cf. CBD 2009). In a focus on transforming into a more sustainable urban hydrology, terms like *ecohydrology* (Zalewski, 2013) or *green infrastructures* (Wright, 2011) are more common. What unites the different terms is their search for alternative ways of addressing societal and environmental challenges that use elements of “nature” in a broad sense in order to achieve desired outcomes. In its latest twist as NBS, an attempt is being made to use nature-inspired approaches to achieve prosperity gains together with reduced environmental risks and a green-growth agenda – resonating well, of course, with the more recent European New Green Deal as broad, ecologically driven development horizon for the coming decade:

Nature-based solutions use the features and complex system processes of nature, such as its ability to store carbon and regulate water flow, in order to achieve desired outcomes, such as reduced disaster risk, improved human well-being and socially inclusive green growth. (EC, 2015: 5)

The respective documents emphasize cost-efficiency and inclusiveness of such efforts, and envision a European world market leadership as important goals to be achieved through the agenda setting and the active promotion of knowledge and experiences made in European countries – with the Dutch water sector being a prime example of how a growing knowledge base and innovative expertise is actively promoted and, with the support of national governments and international bodies, circulated and sold to other places (cf. Thompson, 2018).

Apart from questions that arise in the context of those specific, postcolonial human-nature relations and the power imbalances that are part of the global assemblage of actors, governments and institutions that constitute the NBS discourse,

another question arises at a more fundamental level: what exactly is meant by “nature-based”? What understanding of nature underlies the broader discourse? And how does such an immanent image of nature manifest itself in concrete adaptation projects, especially in the global South? For example, Randrup et al. (2020) characterize NBS as continuation of earlier discourses like sustainable urban development or green infrastructure design, in which the Cartesian division between nature and culture is fundamentally sustained; moreover, the anthropocentric and utilitarian orientation of corresponding policies (partly adopted from a similar conceptualization of nature in the ecosystem services approach) is not called into question. This also makes this new discourse fundamentally receptive to the variously expressed criticisms of the commodification of nature, which entails neoliberal practices and policies that focus on the exploitation and valorization of certain aspects of “nature” (cf. Castree, 2003, 2008) to be included in cost-effective environmental policies.

In contrast, debates in human geography have recently opposed these established concepts of human-environment relations and established new ideas of thinking nature and culture together. Here, conceptualizations like the co-production of social nature(s) (Castree & Braun, 2001), nature-cultures (Haraway, 2008; Gesing et al., 2019) or more-than-human geographies (Whatmore, 2006) offer ways to escape the strict division of a “natural” and a “cultural” sphere, instead focusing on the entanglements of human and non-human actors, practices establishing respective relations, as well as the role of representations in related understandings of nature (cf. Gesing, 2019). The impacts of dominant conceptions of nature on the design of NBS in flood control projects has been shown by Dekker and Fantini (2020), who conclude that successful NBS have to “recognize the diversity in relating to nature (...) in order to maintain the local community fabric and the diversity of natures and waters” (ibid: 275).

4 Adapting Southeast Asian Mega Cities – Nature-Based Solutions or Climate Gentrification?

With a combination of high urbanization rates over recent decades and a specific susceptibility towards relative sea level rise and other hydrological hazards, coastal megacities in Southeast Asia are hotspots of global attention with regards to adaptation and coastal protection – especially as cities like Manila have been depicted as “disaster capital of the world”, with potentially exacerbating risks in the course of global climate change. Regionally, discussions around feasible and cost-effective ways of adapting those cities in the coming decades have been accelerating, and many cities have already witnessed substantial transformations of their coastal settings that are justified with the looming disasters of the coming decades. In all bigger cities, debates are ongoing on how to protect areas threatened by coastal

inundation, as well as by flooding resulting from heavy rainfall events - or, even worse, a combination of both.

Jakarta, for example, has been discussing a National Capital Integrated Coastal Development (NCICD) since several years that would include the world's largest dike structure to seal off Jakarta bay at a length of around 35 kilometers. In a blueprint developed in close coordination with a consortium of Dutch engineering companies, the proposal not only includes the construction of a toll road on the so-called superdike, but also the creation of several hectares of reclaimed land in front of the existing coastline potentially used for high end housing developments and a new CBD (CMED, 2014). Similarly, Manila is currently in the process of designing and implementing an integrated development plan for Manila Bay, that is not only coordinated by some of the same companies that closely advised Jakarta's government in the NCICD plans, but evokes similar futuring practices, combining a fundamental transformation of urban hydrology into a more resilient system with the extensive creation of housing and business development facilities, as well as transport and energy infrastructures (NEDA, 2020).

Both examples fit well in the general thrust of coastal transformations and futuring practices that are currently underway in many Southeast Asian coastal cities; proposed adaptation pathways up to now are often characterized by heavy infrastructure solutions that often entail a fundamental transformation of the existing coastal setup, i.e. formal or informal settlements, infrastructure facilities and, if any, remaining ecosystems like mangrove forests. So far, this involves what Colven (2017) has called the "return of big infrastructure" and at first sight runs counter to the described increases in importance for softer, nature-based forms of (coastal) engineering. Supplementing this view, Herbeck and Flitner (2019) have identified three main axes of futuring practices in urban Southeast Asia that often unfold simultaneously: the securitization, the greening, and the valorization of coastal spaces.

And indeed, traces of the "greening" discourse (often not yet in direct reference to NBS discourses) are commonly found in the planning documents and blueprints that are circulated in the region. Indonesia is experimenting with mangrove replanting in coastal Demak to counteract erosion and the elimination of (semi-urban) aquaculture with plans for the upscaling and replication of experiences in other urban areas; the Manila Bay Masterplan includes whole chapters of ecosystem restoration that are depicted as basis for social and economic development including growth, and whose protection will ultimately reduce "the community's exposure to disasters and vulnerability to climate change impacts, [and lead] to safer settlement areas" (NEDA, 2020: 35); and Singapore uses Dutch-inspired poldering technologies in order to stabilize and expand coastlines on Pulau Tekong, one of the outer islands of the city state, while – in a move that is not untypical for Singapore's self-image as a regional development and innovation engine – founding a research centre on nature-based solutions at its national university NUS with the aim of reaching out to countries in the region and diffusing the knowledges and experiences made in such pilot projects.

The common understanding what nature is conceived of in the strategies described above is not easy to be generalized. Not surprisingly, though, a tendency

towards a utilitarian conception to nature, strongly aligned to ecosystem services thinking, can be recognized. Nature and “natural” ecosystems are then (and just then) integrated into overall strategies, when they provide services to humans – e.g. in the form of retention capacities, the trapping of sediments to counteract erosion, the provision or reproduction of fish resources, or the potential use for sustainable tourism. The projects show that the question of the specific ecosystem services addressed by the respective NBS are defined by a narrow group of actors and in most cases are still aimed at the engineering of the urban hydrological system - although connections to other objectives (e.g. ensuring shrimp farmers’ livelihoods) can be identified in some cases.

It has to be noted, though, that in any of the projects that we found (e.g. mangrove reforestation, land reclamation) we have seen attempts to address diverging perceptions of nature – a fundamental pre-requisite to enable deliberative governance around marine and coastal issues (cf. de Koning et al., 2020), nor the treatment of “nature” beyond an anthropocentric conceptualization. It is not uncommon for supposedly contradictory practices of coastal protection to be combined in one and the same measure. Then it is not surprising when massive land reclamation processes and reforestation with mangroves are mentioned in the same breath, or Dutch-inspired “make room for the river” programs are used as a basis of legitimacy for the eviction of thousands of informal settlers along the riverbanks. Those paradoxes and multiple meanings are not in contrast to the debates on NBS, where *green-grey infrastructures* or *hybrid engineering* are considered to be necessary and legitimate compromises between the two paradigms of coastal engineering. It must be assumed, though, that projects that are obviously only inadequately tied back to potentially contradictory representations of coastal natures – and potential “services” that are deemed important – are not able to achieve a truly sustainable transformation of coastal spaces.

It seems that current lines of urban coastal development in Southeast Asia are caught in the multiple and conflicting demands of global adaptation discourses, path dependencies of existing development paths and postcolonial knowledge networks, as well as new approaches of hybrid and green engineering practices. As a result, paradoxical (strategic) links often emerge between capital-intensive, grey engineering project planning and the at least discursive consideration of ecosystem-based development as a way towards more sustainable and resilient coastal spaces. Unfortunately, the lived experiences with the latest implementations of adaptation projects does not leave much hope for an inclusive governance and transformation of coastal areas; it seems that instead, “the rhetoric of climate adaptation is doublespeak for the displacement of poor, informal communities, and an alibi for unsustainable growth” (Yarina, 2018, s.p.); from what is discussed under the terms Blue Urbanism and NBS so far, there is no reason to believe that this will fundamentally change with the introduction of those approaches.

5 Conclusions

The discourse on Blue Urbanism resonates well with the growing discussions around nature-based solutions in coastal protection. Both approaches portend an ecologically-inspired planning culture, rooted in distinct Euro-American sensibilities around (urban) nature and political practices of decision-making, and an ethic for integrating grey-green-blue infrastructural solutions. Their debates call for integrative urban development processes that take into account the specificities of urban coasts and the perspective of coastal communities. In both cases, there is a demand to overcome the sharp separation between (urban) ecosystems and urban societies to a certain extent, for example in the form of hybrid engineering approaches, “blue” urban development or, more fundamentally, the promotion of a critical awareness of the deep connections between urban societies and coastal and marine ecosystems. We have argued that analyzing different understandings of “nature” or “the natural” in those discourses is crucial for grasping the differentiated agencies for determining the actual shape and potential impacts of such interventions for the protection of coasts in different contexts. By doing so, inequalities on different levels can be analyzed, and structural biases of supposedly more inclusive engineering approaches can be laid open. Here, inequalities can either concern the differentiated capacities for participating in decision-making on coastal adaptation strategies and the privileging of certain forms of knowledge about nature and the benefits of nature-based adaptation strategies in those decision-making processes. Second, inequalities also relate to the differential consideration of human and more-than-human interests in coastal settings when determining concrete adaptation actions. An inclusive social science approach that carefully integrates recent thinking around more-than-human geographies could then “increase justice by looking beyond the human when researching the resocialization of water and nature” (Dekker & Fantini, 2020) and inspire meaningful interventions with mechanisms of reflexive governance (cf. van der Jagt et al., 2021) which could profit both urban residents in coastal locations, as well as ecosystems in their own right. This turn towards “re-imagined communities” (Strang, 2016) of interspecies entanglements could enhance the transformative potential of nature-based solutions in coastal environments.

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