

Epistemic Mobilities: Following Sea-Level Change Adaptation Practices in Southeast Asian Cities

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Abstract

A rich corpus of literature exists on traveling knowledges, their carriers, and connectivities. Yet there is less emphasis on how trajectories of mobility themselves, and the knowledges that circulate coevolve in the process of travel. In this article, we propose “epistemic mobilities” as a conceptual lens with which to empirically trace the transfer and translation of knowledges and practices as they come to be embedded in existing and new social realities. We draw inspiration from technological and policy interventions for living with sea-level change across two cases studies on Jakarta and Manila, and ask how these policies and practices constantly morph when being translated into specific sociopolitical and ecological contexts. We argue that the translocal transforming of adaptation practices and policies, within their contexts of arrival and negotiation, are key to conceptualizing “epistemic mobilities” via local systems and processes of socioinstitutional change.

Keywords

sociology of knowledge, climate change adaptation, policy mobilities, sea level rise, Jakarta, Manila

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Introduction: Coastal Change and Epistemic Mobilities

Traditionally, coastlines have been seen as margins and interfaces in which societies with high degrees of geographic and social mobility are prone to innovation and transformation. Littoral societies today continue to adapt to processes of socioenvironmental change that profoundly shape their material existence. As integral part of change and transformation, discourses, imaginaries, and social practices have travelled across geographic contexts, multiple scales, worldviews, and social strata. In Southeast Asia, early empires such as Srivijaya (670-1286) and Majapahit (1293-1500) as well as their colonial successors (Portuguese, Dutch, and British) were built by crossing oceans and exchanging goods (spices, gold, etc.) and people (slaves, plantation workers, missionaries, and colonial administrators), but also stocks of knowledge, belief systems, and related practices (Evers & Hornidge, 2007; Kulke, 1998). The recent growth of coastal “megacities”—through rapid urbanization and transnational flows of people, capital, goods, services, and ideas—marks a historic continuity in the way that coastal zones are perceived as “interfaces” and concentrated sites in which transformations in social–environmental relations are witnessed, often coinciding with growing social inequality (Kraas & Mertins, 2014; Pelling & Blackburn, 2013).

Movements, exchanges, flows, or travels affect and are affected by travelling entities (Czarniawska & Sevón, 2005; Said, 1983). Travelling objects can alter their meaning and gain or lose value in the process of changing places, that is, they encounter different practices of interpretation and reinterpretation, of appropriation, ordering, and exchange. At the same time, they can bring along and stabilize new practices in all fields of human activity, with many well-known examples of innovations such as the navigational compass or the cast iron plough. These innovations embody knowledge, genius, and practices of experimentation that are semistable, and transferable to a certain extent: the knowledge is always inscribed in some way and thus can be moved around and still keep some of its decisive functions or characteristics (Latour, 1987; Mol & de Laet, 2000).

This article explores how current transnational exchange of adaptation, coping, and mitigation practices and policies for living with sea-level change can be usefully discussed as such a type of mobile knowledge. We draw on discussions within sociology on the communicative and discursive constructions of reality (Keller, 2011; Knoblauch, 2017), in science and technology studies and anthropology with regard to travelling models (Behrends et al., 2014; Rottenburg, 2009) and in geography on policy mobilities (McCann, 2011; Peck & Theodore, 2010) to reflect on the usefulness of a concept that focuses on the mobility, the transfer, and translation of knowledge. Methodologically, the case studies presented in this article are based on multisited field research (Seligmann & Estes, 2020) in Jakarta and Manila, composed of interviews and observations to follow key players and innovations (Czarniawska & Sevón, 2005; Hornidge et al., 2011).

Travelling Knowledges in Translation

Global migration is but one of the many empirical fields, in which mobility and immobility, the travelling and with this the processes of change facilitated by this travelling,

or their rejection, can be tangibly observed. Global environmental change processes such as sea level rise are another field, enabling the study of how travelling knowledges, namely the adaptation practices and policies, are translated into different local contexts, how they change as part of their travel and encourage changes also in the contexts in which they are implemented (Weisser et al., 2014).

Within the sphere of climate change, risk mitigation and adaptation and codified stocks of knowledge, namely adaptation plans, disaster risk reduction (DRR) strategies, or early warning systems as well as concrete coping and adaptation practices on the level of communities and neighborhoods can travel. They can do so with forcibly displaced people or economic migrants, but also with government delegations, through national or regional commissions and platforms (such as the Asian Cities Climate Change Resilience Network) and international donor agencies.

In conceptualizing *epistemic mobility*, two dimensions of mobility are considered. *First*, we see embodied or inscribed knowledges and knowledge practices moving from one system of making sense of reality, of knowing into another. With reference to Berger and Luckmann's definition of knowledge as intersubjectively shared reality (1966), "epistemic mobility" could then simply mean the movement of a policy or an adaptation practice from one social reality to another. Yet several authors have convincingly argued that the traveling entity itself can also change in the "chain of translations" it undergoes, retaining a certain fluidity or plasticity while traveling or moving through a network of practitioners (Latour, 1996; Mody & Lynch, 2010; Mol & de Laet, 2000). Therefore, the *second* dimension of our understanding of epistemic mobility denotes some kind of translation, reinterpretation, or "movement" in the traveling entity itself. Epistemic mobility then is the traveling of embodied knowledge, but it is also the changing practices with regard to this knowledge and the changes in epistemic status resulting therefrom.

Knowledges, Systems of Knowing and Discourses

As pointed out above, we define "knowledge" here broadly with reference to Berger and Luckmann (1966, p. 16) as "everything that is regarded as knowledge in and by society." Thus, no group of society is in a privileged position to define what is worth knowing and considered as "knowledge." Instead, every member of society is (actively or passively) part of a continuous negotiation process defining which interpretations of reality become intersubjectively shared reality. These negotiations are codetermined by the political, societal, cultural, and so on, structures within which the construction of reality takes place (Keller, 2011; Keller et al., 2018; Knoblauch, 2017).

Following from this constructivist understanding of "knowledge," we understand "systems of knowing" with reference to Knorr-Cetina's concept of "epistemic cultures" as "those amalgams of arrangements and mechanisms—bonded through affinity, necessity, and historical coincidence—which, in a given field, make up how we know what we know" (Knorr-Cetina, 1999, p. 1). Yet, to actually travel, we acknowledge the diversity of infrastructures for knowledge mobilities, ranging from the material (e.g., airport and underwater cables) to actors (e.g., consultants, researchers) that

coproduce immaterial infrastructures such as a common language, relatable meaning-making practices, or discourses.

We analyze discourses as structural determinants of how knowledges such as adaptation practices and policies are being made sense of and how they are translated into different local contexts where they become part of new and existing social realities. We draw inspiration from Michel Foucault (1977, 1978) in understanding the mutually constitutive link between power and knowledge complexes, combined with Keller's (2011) study of discourses as knowledge/power complexes that "exist" in "practice(s)" and in "dispositifs." If practices are to be broadly interpreted as "proper" ways of acting, entailing both the discursive and the nondiscursive, *dispositifs* in the Foucaultian (1978) sense can be understood as an ensemble of institutions, people, discourses, and practices that operate as a generative framework for social action. Following Keller (2011), we see them as infrastructures of discourse production as well as emerging out of discourse(s). This distinction of discourses constituted in social practices as well as the resulting *dispositifs* underlines the material and immaterial character of discourses, while at the same time according social actors an important role in constructing, deconstructing, and reconstructing realities".

Thus, the social, communicative, and discursive processes of constructing and shaping social realities also determine the conditions under which "epistemic mobilities" unfold. Studying them in their local to global workings and including their material relations then becomes foundational to any further consideration of the notion and concept of "epistemic mobility".

Travelling Models and Mobile Policies

The concept of "travelling models" (Rottenburg, 2009) assumes that models "do not diffuse by themselves and they cannot be transferred without being translated" (Behrends et al., 2014, p. 2). Thus, blueprints and policies undergo complex trajectories of translation—as opposed to mere transfer—as their characteristics, underpinning logics, leitmotifs, and symbols come to be selectively chosen (Lendvai & Stubbs, 2007). The notion of "intercultural translation" (Rottenburg, 1996) highlights the contexts of translation processes in which own vocabularies and lexicons are cocreated and in turn shape new networks, generating forms of tacit knowledge themselves, taking for example the role of interfacing agents or knowledge brokers. The focus rests on the "mainstreaming" of societal development "models" summarized under, for instance, notions of "knowledge society" (Hornidge, 2014), managerial templates and technological blueprints (Kim & Hornidge, 2016), or inclusive, participatory approaches (Leta et al., 2019), and critiques guided toward incremental and reformist institutional changes, made under the banner of "sustainable development" or "climate action".

We share Behrends et al.'s (2014) skepticism toward diffusionism and, more broadly, the tenets of modernization theory. The analytical lens of epistemic mobilities allows us to explicitly focus on how and why particular practices and policies, facilitated by legitimizing and structuring discourses, gain salience and how their anticipatory value and

their embodied knowledge on sea-level change are reinterpreted and brought to bear through multiple processes of negotiation and adaptation across different geographic, social, and epistemic contexts and scales.

While this is largely in line with the “travelling model” approach, we aim to integrate thinking on “policy mobilities” which has placed particular emphasis on urban spaces as sites in which this translation of transregionally mobile policies into particular geographic and social places can be studied (McCann, 2011; Peck, 2012; Temenos & McCann, 2013). Spaces are thereby not seen as passive containers to which ideas and knowledge flow. Rather, a study of policy mobilities attempts at grappling with the complex spatial interweaving of practitioners, across borders and scales, in which policy development is taking place (McCann, 2011). This implies a critique of simple, mechanistic ideas of policy transfer and redirects the focus to “mutations and open pathways” (Peck & Theodore, 2010, pp. 172-173), where power-laden “institutional legacies and imperatives” (McCann, 2011, p. 109) further structure and translate external expertise according to local specificities. It is here, in the negotiation of structures and processes of knowledge translation, that the debates on policy mobilities link with the above portrayed sociology of knowledge approach to discourse, together forming an integrated and political lens to the study of epistemic (im-)mobilities and the growing and circulating epistemic communities and policy circles within the “consultocracy” (McCann, 2011) on sea-level rise and flood control.

Adaptation and mitigation measures, materially bound practices and inscribed “models”, thus do not flow unidirectionally, they do not merely “trickle down” but traverse multiple policy pathways. “Epistemic mobilities” here provide a new lens on the issue of policy learning, while keeping a focus on broader discourses and the very normative foundations of transformation (Schulz & Siriwardane, 2015) and the knowledges through which “problem solving” is to be achieved (Flitner & Görg, 2008).

Following a Moving Target: Sea-Level Change Adaptation

The research adopted a multisited research design that focused on Jakarta and Manila as regional centers and hubs of sea-level change adaptation. With numerous international organizations active in the field of sea-level change in the region, the assumption that adaptation practices and policies, while also being shaped by international discourses, would travel from one city to another appeared legitimate. Furthermore, the size and complexity of the sites (geographically and socially diverse, multilevel actor networks) and the wide range of adaptation policies and practices meant that the situation in, and access to, the field was to largely determine the further narrowing down of the epistemic mobilities to be studied—the travel and translation of sea-level change related adaptation policies and practices in and between Jakarta, Manila, and Singapore. Together with more pragmatic reasons (existing research networks, project structure), those considerations determined the choice of the study sites.

In the field itself, we followed the actors involved in sea-level change adaptation projects, organizations, as well as communities and households living with it. We

followed innovations by researching the historical pathways and contexts in which actual adaptation material and immaterial practices and policies unfold; and we followed policies focusing on coastal resettlement plans as well as DRR plans and their implementation. All this was analyzed allowing for a special consideration of discourses in processes of policy learning and translation.

Jakarta: Land Subsidence, Sea-Level Rise and Hydroengineering

Jakarta has often been depicted as one of the most vulnerable urban conglomerations in the world, both to urban flooding during heavy rain, as well as to rising sea levels (Firman et al., 2011). City administrations over centuries have taken measures of flood adaptation to prepare (parts of) the city to better withstand flooding events, either caused by heavy rainfall in the hinterland (*banjir*) or by tidal waves (*rob*). In an interesting case of epistemic mobility, large parts of the hydro-technological and wider city planning measures during both colonial and postcolonial times were oriented along Dutch standards and archetypes (Thompson, 2018).

While Dutch Batavia tried to recreate the “streets and canals of home . . . in the middle of the jungle” (Abeyasekere, as cited in Shackford-Bradley, 2006, p. 94), the colonial regime also initiated the “development of a modern native elite” imbued with notions of European progress and civilization, far removed from the masses or *rakyat* (Shackford-Bradley, 2006, p. 98). During its postcolonial decades, the city saw not only various fundamental changes in settlement patterns but also with regard to institutional setups and politics privileging hydro-engineering and (coastal) protection infrastructures that continued well into the post-Suharto *Reformasi* era.

More recently, the provincial government of Jakarta Capital Region (DKI) has developed institutional arrangements for climate change adaptation and flood mitigation, resulting in an abundance of policies and strategies of different governmental departments (Simarmata, 2018). The focus of adaptation planning has thereby shifted “from the land-based defense of rivers, canals, water pumps, and lakes to sea- and land-based protection, including reclamation, pond retention upstream and downstream, and the sea wall” (Simarmata, 2018, p. 51).

Since 2013, the provincial government discusses the National Capital Integrated Coastal Development Plan (NCICD) that has been substantially pushed and coshaped by a Dutch-led consortium of project developers, engineering companies, and architectural firms. The 40b US\$ scheme proposed to seal off Jakarta Bay with a 32 km long sea wall, with the planned reclamation of 17 islands offering prime real estate opportunities and revenues to the treasury (Bakker et al., 2017), while promising to showcase Jakarta as a world class waterfront city (Colven, 2017). Weaving in the mythological and the iconographic, the infrastructural project was to take the form of a Garuda, a protective Hindu–Buddhist raptor-like bird that stands as a symbol of “the national pride of Indonesia” (Coordinating Ministry for Economy and Development, 2014). Entitled by some as the “charismatic megafauna of resilience infrastructures” (Yarina, 2018), this often referred to phrase in policy-making circles of placing the

“Great Garuda in the Mouth of the Dragon” underlines the political dimension of placing the symbol of *bumiputra* identity into the center of Jakarta Bay.

At first sight, the NCICD could serve as an example of how a team of external consultants, backed up by political support, actively “moved” its expertise, its problematizations and ways of producing knowledge, as well as solutions that are derived from the epistemic cultures that the Dutch experts are part of, into a new setting. The processes and debates that followed the introduction of the scheme both within the political institutions in Indonesia, as well as in the areas potentially directly affected by the changes demonstrate contestations of and changes to the traveling entity itself. The institutions involved in determining and implementing earlier adaptation measures (such as the World Bank sponsored Jakarta Emergency Dredging Initiative 2007 and the Jakarta Coastal Defense Strategy, 2013, cf. Silver, 2018), as well as to now make sense of the new project proposal, had their own way of interpreting the plan and the cooperation with the external experts:

I have had a strong debate with the Dutch drafter, at the time of the first transfer of knowledge, I said that it would not happen—because you don’t know the behavior of people here. (Interview with former head of the NCICD team, Ministry of Maritime Affairs)

Because of critiques from various governmental institutions, the responsible team at the Ministry of Public Works compiled six variations of the original plan, all differing in major points from the Dutch proposal. The national planning authority Bappenas formulated the probably most substantial revision by proposing to derive from the focus on hard engineering solutions. A coastal engineer that was trained in the Netherlands stated that,

We propose a very cheap solution, called poldering. We let nature do the job. And we have all the expertise, we don’t need the Dutch. (Interview with NCICD team members at Bappenas)

Presently, further land reclamation has been ceased and the fate of the project is unclear, but it has not been given up (cf. Herbeck & Flitner, 2019).

Manila: Climate Adaptation and Flood Control

Adaptation to climate change in Manila is deeply entrenched in the local histories, discourses, and past experiences of environmental insecurities. The trajectories of adaptation planning today are informed by international discourses and frameworks such as the Sendai Framework (United Nations Office for Disaster Risk Reduction, 2015) and mainly focus on measures to strengthen DRR, with a clear emphasis on flood management and control. The concentration on those sectors mirrors the city’s experience of numerous flooding events during the 20th and 21st century, culminating in two devastating typhoons in 2009 (Typhoon Ondoy) and 2013 (Typhoon Yolanda).

Records of typhoons and flooding can be found in documents of both municipal archives as well as the Spanish colonial administration as early as the 18th century (cf. Bankoff, 2003). Under Spanish rule, first measures were taken to improve both the water supply and drainage of the city by cleaning the existing *esteros* (canals), which was done systematically after 1888 (cf. de Lemps, 2001). The American colonial state in the early 20th century expressed concern over the flooding situation in Metro Manila and took action to reduce impacts of flooding in the central districts, for example, by raising the elevation in certain areas (cf. Pante, 2011). As urbanization and siltation of the waterways continued, flooding incidents after Second World War had increasingly devastating effects. Already in the 1960s, an estimated 70% of the city area were subject to frequent flooding that would at times reach heights of more than four meters (Bankoff, 2003).

After a series of heavy typhoons in the first half of the 1970s, when the rule of long-time president Marcos turned increasingly dictatorial, the government's take on adapting to the growing unpredictability of weather and flooding changed substantially, embracing state of the art-technologies of meteorological monitoring and forecasting "to 'tame' the typhoon" (Warren, 2013, p. 3).

While actively turning toward the latest, globally circulated technologies of weather monitoring, and adapting a global model of hazard control, the Marcos regime did not integrate disaster preparedness thinking into the country's relief policies. It has been argued that despite the attention Marcos paid to tackling Manila's flooding issue by "adopting modern scientific methods" (Kintanar, 1978, as cited in Loh & Pante, 2015, p. 49), the regime continued to aggravate the underlying socio-political and socioeconomic conditions that contribute to the ongoing chronic flooding crisis in the city. While during hazard events in the 1970s, the regime would most of the times be willing to invite foreign engagement and even "encourage big business, overseas governments and aid agencies to provide massive injections of capital and material support for relief efforts" (Warren 2013, p. 17), it would subsequently resist including broader ideas of disaster mitigation or other topical forms of addressing the root causes of the hazards.

Still many of the efforts to professionalize the disaster reactions and to improve the governmental responses to disaster events date back to the 1980s. Under Marcos' rule, the creation of safe living environments for the disaster-ridden population also encompassed the expansion of the "administrative apparatus for flood control" (Loh & Pante, 2015, p. 47), for example, by establishing evacuation and feeding centers across the metropolitan area; many of those institutional infrastructures have been the cores for the professionalized DRR units that are nowadays operating at different administrative levels of all 17 city governments of Metro Manila (interviews with different DRR offices, Johannes Herbeck and Rapti Siriwardane). Such "softer" forms of emergency preparedness have nevertheless been flanked by hard infrastructure measures that involved large investments, like a large-scale project in 1974 for improved drainage of the Pasig River, including the heightening of river embankments and the cleaning and dredging of *esteros*. Parallely, pumping capacities were expanded, with support of Japan's development agency JAICA (Zoleta-Nantes, 2000).

This concentration on hard infrastructure reverberates with parts of the current adaptation planning in Metro Manila, clearly allowing the integration of topical flood control and coastal protection technologies that are globally circulated, among others, by transnational organizations like the World Bank (2015). The most prominent projects in the past decade include the World Bank-funded Metro Manila Flood Management Master Plan and, more recently, the Manila Bay Sustainable Development Master Plan, initiated by the National Economic and Development Authority (2018). This master planning exercise is clearly in line with a recent increase in offshore “private sector-led development that attracts global capital” (Meerow, 2017, p. 2651). Here again, an opening of respective policy processes toward external influences and global actors is inscribed in the declarations of intent of those large-scale projects. It does not come as a surprise then that the Dutch consultant Deltares is leading the consortium which is due to develop the master plan for Manila Bay, including a climate adaptation component with integrated disaster risk reduction measures.

Within those larger infrastructure-driven adaptation processes, international influences are quite openly mentioned by political representatives, showing interesting shifts in the involvement of external expertise and funding:

Yes, over the last 30 years [flood control] was funded under Japanese cooperation, and during those times it was JAICA. Most of the technology and expertise comes from Japan back then. [. . .] Only recently after we received a number of WB grants they are considering Dutch technology. (Interview Rapti Siriwardane with Chief Engineer, Dept. of Public Works and Highways)

One mechanism of how the exchange on technologies of flood control and climate change adaptation is organized internationally is through study tours, for example, to the Netherlands. Here, epistemic mobility is actively promoted:

When I was still member of the DILG [Department of the Interior and Local Government], they took me on a study tour to the Netherlands on water management. [. . .] we went there to look at how the Dutch manage their water, and this was very impressive! Technology-wise, I think they are very advanced. And they show this to the whole region! (Interview Johannes Herbeck with former employee of Dept. of the Interior and Local Government)

Despite the growing relevance of climate change research for Asian cities since the 2000s (Douglass, 2013), the activation and usage of external knowledge for climate change adaptation in Manila has been rather slow. Laycock and Mitchell (2019) argue that this is often impeded by strong networks with bonding social capital in which decision making for adaptation is carried out. Furthermore, the translation and use of existing knowledge, both with regards to the involved physical processes, as well as to suitable measures of climate change adaptation, often fails due to general shortcomings in the Philippine’s planning apparatus, that is, incomplete decentralization or increasingly privatized planning processes (cf. Mitchell & Laycock,

2019). Here, the case of Manila shows how the mobility of epistemic frames and knowledge is narrowed by local political conditions, as well as general characteristics of the respective polity.

Concluding Reflections

Epistemic mobilities, the movement from one system of sense-making, of knowing to another, often facilitated by geographic, social, or cultural mobilities, are basal dimensions of innovation processes in many sectors and political domains. Any innovation that travels, be it an adaptation practice, an infrastructural device, or a policy, has to be translated, often repeatedly, and adapted to the context of arrival. Without this translation and adaptation, without the social, political, and epistemic contexts of arrival making sense of it and attaching meaning to it, innovation will not take hold in society, thereby enabling the long-term development of adaptive capacities. The design and legitimization of best practices and model policies as “portable solutions” (Yarina, 2018) are but a single point in the trajectory of their mobilities.

Like in many places around the world, coastal adaptation processes in the cities of Jakarta and Manila contain elements, practices, and dispositifs that have undergone traveling and translation. As pointed out, international and multilocal players like consultancies and donor agencies play an important role in facilitating and shaping such traveling and translation. At the same time, our examples show the deep entanglement of actual decision-making processes in past decisions and measures, in political and institutional cultures, and in (post)colonial discourses and imaginaries of legitimate and good urban development. This has to be considered when trying to understand how globally circulated and established discourses, such as the discourse on disaster risk reduction, and their respective policies are brought to bear in specific localities. Obviously, traditional approaches of policy transfer that are still deeply entrenched in some global policy regimes and institutions then do not hold up to the “messy” realities of local translation processes. Still we have also seen that policy learning does take place, especially in reference to broader discursive currents and notions that can be facilitated, for example, during study tours.

The above calls for the empirical assessment of sense-making processes with regard to travelling knowledges, here represented by sea-level change adaptation policies and practices, as well as for analytically grasping them in their foundational role for any societal development processes. With our focus on epistemic mobilities, we have highlighted the importance of combining to this end an analysis of translation processes regarding specific innovations, practices, or targeted policies with an analysis of broader societal discourses that frame and shape their uptake. This brings historical legacies and path dependencies into focus, as well as the power laden societal debates around political priorities and issues of justice.

In the context of increasing environmental risks, transregional processes of policy collaboration and the establishment of reliable processes for exchanging and adapting institutional, social or technological innovations into new social contexts will remain important. Acknowledging and understanding, based on thorough empirical research

and analytical reflections, the role that epistemic mobilities (and immobilities) play in these processes, we argue, is a much needed start.

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