Environmental Mobilities: An Alternative Lens to Global Environmental Governance

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Abstract

This article explores the relations between movement, the environment, and governance through the cases of cruise tourism, plastics in the oceans, and environmental migration. It does so by means of a mobilities perspective, which has its origins in sociology and geography. This perspective shifts the analytical focus toward mobilities and environmental problems to understand their governance, as opposed to starting with governance, as many global environmental governance studies do. We coin the term *environmental mobilities* to refer to the movements of human and nonhuman entities and the environmental factors and impacts associated with these. Environmental mobilities include movements impacting on the environment, movements shaped by environmental factors, and harmful environmental flows, as we illustrate by means of the three cases. We demonstrate how zooming in on the social, material, temporal, and spatial characteristics of these environmental mobilities can help illuminate governance gaps and emerging governance practices that better match their mobile nature. In particular, a mobilities lens helps to understand and capture environmental issues that move, change form, and fluctuate in their central problematique and whose governance is not (yet) highly or centrally institutionalized.

In a globalized world, we are facing a continuous growth of movements of people, goods, materials, and information. These movements, analytically termed *mobilities* (Urry 2000), actively intersect with processes of environmental change. Some mobilities (such as hazardous waste) are inherently harmful to the environment, while other mobilities (such as migration) are set in motion by the impacts of environmental change. On top of that, through mobilities—such as via migration or transnational trade routes—the origins and impacts of environmental problems can become widespread and even scattered across the globe (Adger et al. 2009; Benzie et al. 2013; Young et al. 2006).

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In this article, we explore the mobile character of environmental issues in relation to questions of governance and discuss the added value of a mobilities lens to the scholarly field of global environmental governance (GEG). What aspects of environmental issues and their governance does a mobilities lens highlight? What does it add to what we already know about GEG? Generally, we argue that a mobilities lens helps uncover the mobile, transformative, and interlinked nature of environmental issues and provides analytical tools to study how their everyday dynamics sometimes place them outside the scope of institutionalized agreements.

As carefully summarized by Dauvergne and Clapp (2016, 2), much GEG scholarship centers on the analysis of "specific and formal international governance schemes." Though strong in its focus on grasping the multilevel dimensions of governance, in particular, the functioning and design of specific governance mechanisms and the diverse forms of steering by agents associated with these (Dauvergne and Clapp 2016, 7), there are concerns that the GEG scholarship is too narrow in its conceptualizations and scope. The core unit of analysis is governing institutions and their actors. The formation, functioning, interplay, and effectiveness of environmental institutions are core themes within the literature (for an overview, see Pattberg and Widerberg 2015). Consequently, the focus tends to be on institutionalized settings of governance, such as UN treaties or agreements resulting from public–private partnerships. The methodological focus often is on global-level issue areas (e.g., UN debates about REDD+) or on specific place-based case studies (e.g., forestry governance in Indonesia). However, in this way, the insights gained risk being mere "close-up snapshots that cut out a much bigger, more complex, global picture of crisis" (Dauvergne 2010, 2). In that context, some researchers have called for a better grasp of the wider, complex and "wicked" problem dimensions that interrelate with and shape governance arrangements and environmental outcomes (Dauvergne 2010; Dauvergne and Clapp 2016; Levin et al. 2012).

In response to such a critique, critical political economy approaches within GEG literature provide insights into the wider dynamics of trade and finance, patterns of consumption, and the associated problems of inequality and injustice (e.g., Clapp 2014; Dauvergne 2010; Meyfroidt et al. 2013). They show how the everyday environmental problematique is situated within a "global system that is driving unsustainable production" (Dauvergne 2010, 2). In a similar vein, socioecological resilience literature demonstrates the wider complexity of environmental governance. While political economy approaches highlight the global structural dynamics shaping specific regimes and everyday environmental problems, socioecological resilience literature in particular connects GEG debates to concepts of surprise and nestedness (Adger et al. 2009; Challies et al. 2014; Folke 2006; Kissinger et al. 2011; Young et al. 2006). They point out that globalization gives increasing power to local actors and processes in initiating transnational change and try to understand their self-regulating capacities (Adger et al. 2009).

By focusing on the complex interplay of environmental issues and their governance, both accounts adopt a more relational approach to GEG. Such an approach has long been argued for in sociology and critical IR literature (e.g., Emirbayer 1997; Jackson and Nexon 1999; Lapid 2001; Crossley 2011). A relational approach sees structure and agency as inherently interlinked, as it takes the social *interactions* rather than the social units as the unit of analysis. It views entities like states as "entirely embedded in process and relation" (Jackson and Nexon 1999, 298). Stasis and change are thereby in their sources endogenous (Jackson and Nexon 1999), occurring through interactions and interdependencies between agents. Social reality is, then, studied in "dynamic, continuous, and processual terms" as opposed to focusing on "static 'things'" (Emirbayer 1997, 281). As a consequence, adopting a relational understanding of governance can help in moving beyond a focus on "steering" as "an intentional and authoritative activity" by agents (Bulkeley et al. 2012, 595).

The mobilities approach we introduce builds on these relational approaches but looks beyond interactions between social actors alone. Instead, we seek to understand the relations between movement, the environment, and governance. In examining the connections between what we term *environmental mobilities* and their governance, our analysis starts analytically from movement. More specifically, we examine how the spatial, temporal, social, and material characteristics of environmental mobilities (such as their composition, speed, routes, and volume) shape, facilitate, or hinder particular ways of governing. We illustrate this approach via three short case studies: cruise tourism, plastics in the oceans, and environmental migration. Each case represents a particular interaction between the environment and movement. The first case looks at movement impacting the environment; the second case concerns a harmful environmental flow; and the third case is about environmental issues as a cause of movement.

We proceed as follows. We start with a short background on mobilities studies. This is followed by a section exploring the relations between mobilities and the environment as discussed in the literature to arrive at a definition of environmental mobilities. The subsequent section sets out how to examine environmental mobilities and their relation to governance and illustrates this through the cases of cruise tourism, plastics in the oceans, and environmental migration. In these cases, we examine how a mobilities perspective can expose governance gaps by highlighting mismatches between the particular characteristics of environmental mobilities and existing governance practices. We also identify governance practices that seek to adapt to the mobile characteristics of the issue. We end by discussing the main contribution of an environmental mobilities approach for the study of GEG.

A Mobilities Perspective

Over the past two decades, a "mobilities paradigm" (Sheller and Urry 2006) has emerged in the social sciences and humanities. Whereas sociology and

geography for a long time focused on places, territories, and communities, thereby assuming a stable point of view to understand social reality (Cresswell and Merriman 2011), the mobilities paradigm starts from the perspective of movement. In doing so, it has become influential in the fields of sociology (Urry 2000, 2007) and anthropology (Salazar 2010). For geography, which has a longer history of focusing on mobility, it has led to a renewed focus on why and how people and things move across space (Adey 2010; Cresswell and Merriman 2011).

Mobilities research has a number of key characteristics that distinguish it from other approaches in the social sciences. First, as discussed earlier, it analyzes phenomena from the viewpoint of movement. Second, it uses the term *mobilities* rather than the singular term *mobility*, because the aim is to understand not only how people but also how images, communications, and objects are on the move and how these actual and potential movements organize and structure social life (Sheller and Urry 2006, 212). It also pays attention to how these diverse mobilities interconnect, for example, how people and objects often travel together or how the mobilities of images enable or constrain the mobilities of people. Third, mobilities research looks at various scales of movement. As Hannam et al. (2006, 1) phrase it, *mobilities* "encompasses both the large-scale movements of people, objects, capital and information across the world, as well as the more local processes of daily transportation, movement through public space and the travel of material things within everyday life." Fourth, mobilities scholars understand movement in relation to the infrastructures or systems that make movement possible. According to Urry (2007, 13), these "mobility systems" "permit predictable and relatively risk-free repetition of the movement in question." They include the sociomaterial infrastructures and mobile means that enable and channel the movement of people, goods, and information (including fiber-optic cables, roads, seaports, cars, mobile phones, etc.).

Mobilities studies is an interdisciplinary and thematically broad field, but the environmental issues connected to mobilities have certainly received scholarly attention. Here the emphasis has been on the sustainability implications of carbon-based mobility systems, such as aeromobility, automobility, and shipping (see Urry 2013). A number of other studies have analyzed the mobilities (and immobilities) of people in response to an environmental disaster, such as an earthquake or flood, to which we will connect later in our case on environmental migration (e.g., Black et al. 2013). There are also scholars focusing on the societal challenge of sustainable mobilities by analyzing the planning, design, and use of (urban) mobility systems and infrastructures (see Canzler et al. 2008; Freudendal-Pedersen 2009; Jensen and Lanng 2016). Geographers in particular have analyzed the politics and governance of material flows, such as flows of oil and CO_2 (Barry 2013; Bridge 2011).

However, researchers have not attempted to systematically conceptualize the various relationships between mobilities and environmental issues and the

ways in which environmental mobilities challenge and shape governance. We aim to do so here, by introducing the term *environmental mobilities* and then outlining how these can be analyzed in relation to their governance.

Defining *Environmental Mobilities*

We propose the term *environmental mobilities* to refer to the movements of human and nonhuman entities and the environmental factors and impacts associated with these mobilities (including those of the systems that enable them). The term captures a three-way relationship between mobilities and the environment. First, the movement of people, materials, and information impacts the environment in various ways. Second, there are material and immaterial environmental issues, such as waste, pollution, and CO_2, that have a particularly mobile and cross-border character. Third, environmental issues or changes may shape or cause movement. This leads us to distinguish three analytical types of environmental mobilities:

1. *Mobilities and their systems impacting on the environment*: A first type of environmental mobilities is the movements of people, goods, and information with negative side effects on the environment. Such mobilities include, for example, air travel, intracity commuting, shipping or logistics, tourism, and telecommunication. As Dauvergne (2010, 3) argued in his work on consumption, "shadow effects of consumption can have as great, if not greater, consequences. And the globalization of corporations, trade, and financing is making these shadows longer, deeper, and harder to see." Indeed, negative environmental impacts originate not just from movement itself (e.g., of a commuter traveling by car) but also from the mobility systems that make this movement possible (e.g., cars, roads, and fuel stations). These systems rely on natural resources for their everyday operation; may have negative impacts on biodiversity and ecosystems; and may cause emissions, pollution, or waste. Taking cruise tourism as an example, environmental implications are directly linked to the movement of tourists and ships (e.g., the waste and emissions they produce) but also environmental impacts of the infrastructures that enable their movement (e.g., ports, aviation, local transport).
2. *Material environmental flows*: There are also flows of materials or substances that are particularly harmful to the environment and as such constitute an environmental issue (Spaargaren et al. 2006). These include, for example, carbon, nuclear disasters, hazardous waste, GMOs, sewage water, and plastics. While environmental impact in the first type of environmental mobilities represents a side effect of movement of other entities, here the harmful flows themselves are the focal point. Some of these environmental flows move in relatively predictable ways as they are channeled through specific infrastructures. Digital waste, for example, may first be collected by the

waste collection system, temporarily stored, and then transported by ship from Europe to Africa, ending up in the informal settlements of Kampala, where it is sold again for different uses (e.g., Iles 2004; Dauvergne 2010, 3). Other environmental flows, such as plastics in the ocean, move relatively freely and chaotically, using media such as water or air. An environmental flow may thus be channeled through several socio-material infrastructures and travel by various mobile means.

3. *Movement shaped by environmental factors*: Finally, movements of people, animals, and materials are often (partly) driven by environmental factors. This is, for example, the case with climate-induced migration. Here movement is caused by changes in the environmental domain—in this case, droughts, sea-level rise, or extreme weather events that damage homes and land and thereby put communities at risk (Biermann and Boas 2010; Black et al. 2011). Similarly, changing sea ice or weather conditions can lead to changes in the daily patterns of subsistence hunting of Indigenous communities, changes in the destinations for Artic cruise tourism, and redirections in shipping routes.

It should be noted that our typology is an analytical device rather than an empirical categorization. A crucial difference between the first type of environmental mobilities and a material environmental flow is that the focus for the first one is on movement enabled by a mobility system (i.e., the tourist on a cruise ship) to understand when, where, and how these mobilities produce waste, carbon dioxide, ecological damage, or other environmental impacts. With the second type, we follow the harmful flow through different mobility systems or stages of its lifetime. For example, the waste that is produced during the cruise can be considered a material environmental flow that can be followed when it either enters the marine environment or is taken ashore for treatment. The third way of approaching cruise tourism would be to look at how environmental change impacts movements, that is, how as a result of extreme weather events, cruise flows might be changing. The three types of environmental mobilities thus represent different starting points for taking the mobile or the mobility-related character of environmental issues seriously.

Analyzing Environmental Mobilities

Given the current lack of interaction between the two fields, we argue that GEG can gain from engaging with mobilities studies. In making this connection, our analysis starts analytically from movement to understand how environmental mobilities make use of particular mobility systems and how the ways in which they move enable and constrain forms of governance. To understand the characteristics of environmental mobilities, we need to start from examining *what* is moving, and *how* it moves, by analyzing the material, social, spatial, and temporal dimensions of environmental mobilities.

To understand the *materiality* of environmental mobilities, we can build on studies that examine the geographies of waste. Such studies argue that as things move, the material properties of these things also morph. When end-of-life ships are demolished, for example, their materials are separated, segregated, reused, and refurbished into furniture for middle-class Bangladeshi consumers (Gregson et al. 2010). This shows that not just the materiality of things, but also their meanings, are multiple and mutable (Gregson et al. 2010). Material aspects thus include the material composition of mobilities, their volume, and their mutability. We propose to take the *social* aspects of mobility to refer to the meanings attached to mobilities and the ways in which people experience their mobility (see Cresswell 2010), but also the social relations that make possible, require, or constrain mobilities (Larsen et al. 2006). These social aspects are an important component of environmental mobilities because they shape not only movement but also whether these mobilities are seen as problematic, hazardous, or polluting. The *spatial* and *temporal* aspects of mobilities include the routes, speed, and rhythms of movement (see Cresswell 2010). Information about the routes taken and the rhythms in which mobilities move can, for instance, inform us about their level of predictability and controllability. Spatial and temporal characteristics of mobilities concern not only movement but also moorings (Hannam et al. 2006), that is, the spaces where mobilities temporarily halt, anchor, or assemble, for example, the places where cruise ships temporarily board ashore.

In the remainder of this article, we illustrate a mobilities perspective to environmental issues and their governance. We do so by analyzing the characteristics of three environmental mobilities—cruise tourism, plastics, and environmental migration—to examine how these shape practices and forms of environmental governance. The cases are largely derived from a review of secondary literature to provide a meta-level analysis of key governance issues in those areas when viewed from a mobilities lens. The case of environmental migration also includes data from fieldwork in Bangladesh carried out by one of the authors (Boas) in fall 2017 and from interviews done with humanitarian organizations. We chose these three cases for several reasons. First, they represent different types of environmental mobilities, enabling us to show how a mobilities perspective can be applied to a wide range of environmental issues. Second, our three cases represent less institutionalized fields of governance, where well-functioning institutionalized agreements are either lacking or considered ineffective. We thereby make clear how a mobilities perspective brings to the fore governance gaps and new emerging governance practices. Third, they enable us to show how the characteristics of environmental mobilities matter for governance.

Cruise Tourism

With approximately 26 million cruise passengers worldwide (Cruise Lines International Association 2017), cruise tourism is among the fastest growing segments in the global tourism industry. From an environmental mobilities perspective,

cruise tourism represents a relatively stable mobility system (type 1), with ships taking predefined routes and mooring at specific ports. The development of the mobility system has stirred societal and academic debates about the environmental impacts and regulation of cruise mobility (e.g., Dobson and Gill 2006; Johnson 2002; Farreny et al. 2011; Klein 2009, 2011; Lamers et al. 2015). The growing size and complexity of cruise tourism operations makes their environmental impacts both considerable and diverse. In terms of materiality, enormous volumes of fuel and water are used to operate the ship, to service passengers, and to fly in passengers from around the world. Local air pollution and global greenhouse gas emissions result from running the main and auxiliary engines of the ship, resulting in type two environmental mobilities. The discharge of sewage water, bilge water, and ballast water causes marine pollution and biosecurity risks. Depending on how organic, plastic, chemical, and other types of waste are handled on board and in ports, cruise tourism may generate substantial quantities of solid waste. The size and number of ships matter, particularly in relation to the capacity of ports to handle associated flows of waste, fuel, and water or the capacity of the marine environment to absorb impacts from various emissions during normal operations or after an accident. Finally, transferring and entertaining passengers in hub harbors and ports of call lead to overcrowding and degradation of conservation areas.

In terms of spatiality, existing governance practices are predominantly place-based, at multiple levels and conducted by a diversity of actors. International environmental standards for cruise tourism, set by the International Convention for the Prevention of Pollution from Ships (MARPOL) of the International Maritime Organization (IMO), provide a bottom line next to standards set by states at the level of regional seas or territorial waters (Perić et al. 2016). This means governance results in a complex and fragmented mosaic of geographical spaces in which particular activities are prohibited or restricted. For example, MARPOL stipulates that sewage water and ground food waste may only be discharged three miles from the shore. MARPOL relies on active enforcement by nations where ships are registered, while many large cruise companies circumvent these policies by registering their ships in states without IMO membership or with limited enforcement capabilities (Lamers et al. 2015). Due to these weak governance arrangements, individual states may have more stringent environmental policies to protect their marine and coastal environments. For example, the state of Alaska requires much stricter regulations for cruise ships plying Alaskan waters, such as rules demanding the use of advanced waste water treatment systems (Klein 2011).

Governance Gaps Regarding Cruise Tourism

A mobilities perspective enables us to analyze more clearly how the transnational and mobile character of cruise tourism is frequently at odds with the place-based way in which environmental impacts are governed. In terms of

spatiality, cruise ships move through areas subject to different governance regimes, which creates opportunities for cruise companies to avert regulations. While stricter environmental standards by states or ports would make sense from an institutional perspective, cruise companies have been reported to reroute their ships to international waters during the night to empty their wastewater tanks, to deploy their older emissions-intensive ships in regions without such strict regulations, or to switch off advanced environmental systems in regions where their use is not required (e.g., Timothy 2006). A thorough understanding of the material, spatial and temporal characteristics of the environmental mobilities associated with cruise shipping enables us to identify gaps that arise from the mismatch with place-based governance arrangements.

Mobilities-Oriented Governance Practices

A mobilities perspective also enables us to identify governance practices that are more closely linked with the mobile character of cruise tourism. With regard to sociality, cruise companies themselves are forming networks to negotiate and manage where the cruise ships moor and what activities are undertaken during such visits, with mixed results for environmental protection. A recent study demonstrated how visits of cruise ships to the Caribbean island of Bonaire, and the tourist activities undertaken during those visits, are governed by the transnational network of the Florida and Caribbean Cruise Association (Van Bets et al. 2017a). By forming a strong corporate network, the cruise lines set the rules of the game for negotiating with small island states in the Caribbean about possible visits at the most favorable conditions. In Bonaire, cruise companies now pay lower berthing levies and harbor service costs, while cruise tourists enjoy reduced tourist taxes and entrance fees to protected areas. However, emerging forms of self-regulation through private networks in the cruise mobility system do not necessarily have to lead to a race to the bottom with regard to environmental standards. Research on self-regulation of expedition cruise companies in the Polar regions suggests that here a strong impetus to collaborate for safe navigation and to maintain the quality of the wilderness experience results in overcompliance with environmental standards (Van Bets et al. 2017b). Similarly, in some regions, such as the Mediterranean and the Baltic Sea, cruise ports are setting up governance networks to collectively set environmental or social standards to prevent large cruise companies from employing the politics of divide and rule (e.g., Cruise Baltic 2017). In these cases, environmental standards become coded into governance networks that travel as part of, or at scales that match, the environmental mobilities associated with cruise tourism.

Plastics in the Oceans

The presence of plastics in the oceans, from an environmental mobilities lens considered a material environmental flow (type 2), has gotten increasing attention

recently. The material characteristics of plastics that allow for convenience and a variety of applications in our make-take-waste society are exactly why concern exists over plastic pollution: its durability and lack of biodegradability. A vast array of different types of plastic (e.g., nylon, polyethylenes, polyvinyl chloride) escape to the marine environment in large quantities, where the plastics disintegrate into microplastics and act as a carrier of toxic components. It is estimated that between 4.8 and 12.7 metric tons of plastic enter the marine environment every year (Jambeck et al. 2015). The vast spatial extent of the environmental flow of plastics has become increasingly clear as scientists have discovered plastics, for example, in Arctic ice (Peeken et al. 2018) and at the bottom of the Mariana Trench (Jamieson et al. 2017). The combination of the characteristics of plastics (e.g., size, shape, and buoyancy) and environmental conditions, such as weather, winds, and currents, determines how plastics spread from land to sea and end up in ocean spaces, such as the six ocean gyres or the seafloor (Galgani et al. 2015; Eriksen et al. 2014). While it is clear that macroplastics impact marine and benthic life through ingestion, entanglement, and smothering, knowledge is lacking about how microplastics impact marine life, the food web, and, ultimately, human health.

Fragmented Governance

The global spatiality of the environmental flow of plastics and its impacts are at odds with the fragmented nature of its governance, including the lack of a comprehensive and binding international convention. The only global initiative is the nonbinding Honolulu Strategy. Other binding agreements are too limited in jurisdiction and scope to deal with the issues comprehensively. For example, in terms of spatiality they focus on ocean-based sources of plastic pollution (e.g., shipping) or are regional in nature (e.g., covering the North East Atlantic), while the majority of plastic pollution is land based (Gold et al. 2013; Simon and Schulte 2017). In this context, state and nonstate actors are actively seeking to intervene in the environmental flow of plastics in various ways: by collecting and capturing plastics in the oceans and by reducing the movement of certain types of plastics through bans or levies.

First, many nonstate organizations and initiatives have emerged that focus on combating plastic pollution through developing and experimenting with removal and cleanup strategies, such as the Ocean Cleanup, which has the stated aim of removing 50 percent of the Great Pacific Garbage Patch in five years. Increasingly, these cleanup approaches are combined with product development, such as in clothing, consumer products, and packaging. While these corporate social responsibility and bottom-up approaches can deliver important contributions to governing plastic pollution flows (Landon-Lane 2018; Vince and Hardesty 2017), from the perspective of environmental mobilities they are focused on end-of-pipe solutions through removal of plastics from the

marine environment rather than curtailing the growing production and use of plastics (Dauvergne 2018).

Second, global plastic pollution is increasingly turned into a national issue through government interventions. These interventions typically ban or tax the production and use of two types of plastics: single-use plastic bags and microbeads in cosmetic products. They have been widely adopted across the globe, although there are differences in how this has been done (Clapp and Swanston 2009; Xanthos and Walker 2017). Nevertheless, given the many types of plastics, such regulations only target the tip of the (plastic) iceberg. Moreover, studies (e.g. Environment Agency, 2011) have also shown that, when considering the whole life cycle, the environmental benefits of alternatives to plastic bags are not necessarily more environmentally friendly.

Toward Mobilities-Oriented Governance?

A more mobilities-oriented governance approach would, for example, seek to transform the direction of plastic flows from global and linear movement to becoming circular at smaller scales, seeking to transform the meaning of plastics: instead of seeing them as waste, plastics become a resource for a sustainable plastics economy. Recent initiatives have focused on increasing reuse and recycling of plastic materials by capturing, redirecting, and closing the flows of plastics (European Commission 2018; World Economic Forum, Ellen MacArthur Foundation, and McKinsey and Company 2016). The European Commission (2018) recently stated that by 2030, all plastic packaging should be reusable or recyclable. Closing the cycles at the EU level should also bring a halt to existing practices of exporting plastic waste to countries in Asia. While circular economy approaches to the marine litter problem seem promising, technical challenges lie ahead in terms of expanding the recycling options from only high-value plastics (e.g., PET) to mixed and laminated plastics (Garcia and Robertson 2017), as well as in designing and building new collection and waste infrastructures that have the capacity to cover all types of plastic. Moreover, social challenges, such as changing the ways in which citizens use and dispose of plastics, need to be overcome. A mobilities lens to these challenges enables us to see the complexity of redirecting environmental flows connected to everyday consumption and waste practices. This requires understanding where different plastic flows (i.e. different types of plastic) currently moor and leak into the environment and what this implies for future infrastructures for recycling and reuse. It also brings up the question where plastic collection points should be located to logically connect to people's everyday (mobile) practices, such as commuting, leisure, or shopping.

Environmental Migration

Environmental change through the impacts of sea-level rise, storms, and droughts may compel people to move (a type 3 environmental mobilities).

The multicausality of migration, and uncertainties about time frames, has made it impossible to provide a rigorously tested estimate of how many people may be uprooted (Gemenne 2011). Environmental migration also does not manifest itself in one form, as some people may need to migrate for longer periods of time, whereas others may be temporarily displaced on short distances. These two forms of environmental migration often relate to the temporality of the environmental event. Research shows that we can at least differentiate between two types of environmental change: slow-onset environmental dynamics and rapid-onset events, the former emerging more gradually with long-lasting or permanent effects (e.g., sea-level rise or land degradation), the latter being sudden (e.g., extreme storm, flood) and catching people off guard when not properly warned (Black et al. 2011; McLeman and Hunter 2010; Warner 2010).

Thus far, there has been a lack of governance mechanisms aimed at protecting environmental or climate migrants (Biermann and Boas 2010). The majority of mechanisms that are emerging tend to focus on people fleeing rapid-onset disaster situations. For example, the office of the UN High Commissioner for Refugees and other humanitarian organizations concentrate on people displaced by sudden and rapid-onset disasters, internally or across borders (Gemenne and Brücker 2015). When viewed from a mobilities perspective, the *spatiotemporal* characteristics of human movements resulting from such rapid-onset disasters, with many people affected at once and leading to displacement in large groups at similar locations (in shelters or camps), make such human (im)mobilities a topic of high political priority. Indeed, the often "sudden" character of a rapid-onset disaster and its extremely disruptive social, material and spatial effects (destroyed houses and infrastructure, casualties and large groups of homeless persons) attract attention from external governance actors seeking to respond to such emergencies. For the same reasons, information infrastructure to assist people is actively emerging for these types of disasters. For example, in Bangladesh, people are being warned about upcoming cyclones via text messages, television, and radio. Also, various sources of data, such as Google Earth and Twitter, can be used to find out where help is needed.

Governance Gaps Regarding Slow-Onset Migration

A mobilities perspective asks us to look at who is moving, how people are moving, and why they are moving, as the starting point of thinking about governance. When doing so, we can identify multiple profiles of environmental migrants that each have different governance needs. Indeed, a closer look at who is moving shows that many environmental migrants do not match the profile of suddenly displaced persons needing temporary housing and humanitarian relief. People also move away because of more gradual, slow-onset environmental processes, such as drought, sea-level rise, or erosion. Again seeing this in terms of its spatial and temporal dimensions, it is vital to stress that such more gradual environmental processes do not affect everyone at the same

time and to the same extent. Unlike with rapid-onset disasters, people do not leave in large groups at once to end up in the same shelters or camps but instead become gradually spread out over the country. For example, in Bangladesh, many areas are affected by gradual river or sea erosion, leading to a highly fragmented yet continuous form of migration: those living closest to the coast have to move first, while those living farther away leave a few years or even decades later.[1]

So far, people who migrate in the context of slow-onset changes miss out on more formal forms of protection. Interviewees from affected areas in Bangladesh stressed that most aid comes after a cyclone, whereas hardly any agency responds to the gradual but devastating impacts of erosion. The slowly creeping problems of erosion often do not make it to the news, making them less attractive for donors. As argued by an interviewee from the International Organization for Migration (IOM), "It is easy to get money for the lifesaving phase; it is much harder to get money for disaster risk reduction."[2] However, the socioeconomic conditions of these more gradually affected communities makes them highly vulnerable. In the absence of formal protection, people are largely on their own, self-governing their situation via their social networks. Their coping strategies include moving in with family members, building a temporary house on the latest embankment, or moving to the slums of a nearby city, where others from the village have gone as well. The information exchange and support for migration, resettlement, and return thus largely originates from, and stays within, the affected community.

Mobilities-Oriented Governance Practices

Within this lacuna of formal governance arrangements or interventions, some mobilities-oriented governance practices are emerging that do try to sync with the everyday rhythms of the slow-onset and more gradual forms of migration. For example, the IOM occasionally experiments with temporary labor exchange programs through which migrants from regions affected by environmental events or other hardships can travel to other regions where labor is needed.[3] In this way, migrants can diversify their income sources through migration and continue to support those in the home villages. In line with mobilities thinking, the IOM tries to adjust its support to ongoing mobility patterns and coping mechanisms. Yet, as we discuss in the concluding section, also these mobilities-orientated governance practices are not without their politics and have particular governance implications.

1. This section is based on more than fifty interviews, many field visits, and observations done in the coastal areas of Bangladesh and local migrant destinations, such as the cities of Dhaka, Cox Bazaar, and Chittagong.
2. IOM, interview with the author, Geneva, May 23, 2011.
3. IOM, interview with the author, Geneva, May 23, 2011.

Conclusions: A Different Angle to the Study of Governance

In this article, we propose a mobilities lens to the GEG field that makes the mobilities, rather than the institutions or the governance settings, the central unit of analysis. We concur with the work of other scholars trying to broaden the predominant focus in GEG literature on analyzing well-institutionalized settings of governance. As Dauvergne and Clapp (2016, 7) argued in their review of the state of the art of global environmental politics [GEP],

> if the field fixes its gaze too closely on theoretical refinements of existing governance arrangements and the intricacies of institutional dynamics, scholars may miss important developments regarding new environmental issues that as yet are not subject to sophisticated governance frameworks.

Our contribution to GEG literature can be summarized as follows.

First, a mobilities lens *centralizes the environmental problem in the analysis* and takes it as a starting point to understand governance, instead of the other way around. This helps to address concerns posed by Dauvergne and Clapp (2016, 7) that environmental governance literature tends to focus on questions of governance, which "risks distancing the GEP field from its intellectual roots, which put environmental issues at the center." Our mobilities lens is particularly suitable for understanding environmental issues that cross (national) boundaries or that result from the increased mobilities of people, goods, and information in a globalized world. This includes the negative externalities of the movement of people for work, leisure, and social purposes and of the shipping of consumer goods across the globe, the migration of people and animals due to environmental change, and the transboundary flows of used goods, wastes, and hazardous materials. Such issues are often complex and deeply intertwined with our (unsustainable) everyday consumption and mobility practices.

Our approach starts from an understanding of the social, material, spatial, and temporal aspects of environmental mobilities, thereby providing key insights into the (global) patterns, trajectories, and complexities of environmental issues. The case on environmental migration demonstrates how a mobilities lens provides a grounded understanding of its multiple and complex spatiotemporalities. For cruise tourism, in contrast, the spatiotemporalities were shown to be much more predictable, as a transboundary cruise mobility system governs the routes and moorings of cruise ships and their passengers. Plastics in the ocean, on the other hand, move in fluid ways, floating in the oceans and accumulating in ocean gyres. Here it became clear that, materially, plastic is not a single but a heterogeneous entity, prone to disintegration. Thus each environmental problem has its own characteristics that, as we have argued, interrelate with, and shape, governance arrangements.

Second, a focus on the characteristics of environmental mobilities provides a means to detect the *governance gaps and weaknesses of hegemonic governance arrangements*. The case on environmental migration shows how governance actors

tend to focus on one side of the problem (the short-term but large-scale movement resulting from rapid-onset events), while largely overlooking the more gradual and fragmented movements related to slow-onset environmental changes. While large-scale sudden disasters attract donors and assistance, people affected by gradual but more structural environmental changes receive little to no help. Meanwhile, the latter changes can lead to permanent or more long-term land loss, thus having graver implications for actual out-migration. In a similar vein, in the case of cruise tourism, a mobilities analysis allowed us to highlight the mismatch between place-based governance and the highly movable and spatial character of cruise ships. If this gap is not managed, it is easy for cruise operators simply to avoid environmental regulations by temporarily moving to unrestricted areas to discharge their waste.

Third, in addition to detecting governance gaps, a mobilities analysis can help to illuminate the *emergence of mobilities-oriented governance practices, as well as the politics associated with these*. Mobilities-oriented governance practices seek to capture, control, redirect, or regulate movement, instead of taking particular sites or events as the object of regulation. In the cruising domain, a voluntary network of cruise companies emerged that might be better able to ensure implementation of environmental standards, because the standards can be said to "travel with" the cruise ships. For plastics, circular economy approaches seek to redirect movements so that plastics do not become marine debris but reenter the economic system as a valuable material. Yet, this does not challenge the widespread and routine use of plastics in our societies and might end up serving the interests of the plastic industry. A similar tension surfaces in the case of environmental migration. Here the IOM is experimenting with labor programs to better fit the daily realities of the migrants. However, such programs have been critiqued for placing the responsibility for resilience with the individual migrant. There is a risk of depoliticizing the issue away from broader questions of liability and of what the international community should do to offer protection (Bettini et al. 2017). A mobilities perspective, in support of relational approaches more generally (Adger et al. 2009; Lapid 2001), shows that environmental migration is not some isolated local phenomenon, detached from global dynamics. Instead, the very issue is a consequence of global dynamics of climate change and other modernization processes.

In conclusion, by focusing only on the well-known governing actors and institutionalized governance settings, the GEG field risks missing out on those environmental issues that are not subject to formal governance but that nevertheless have important implications for the sustainability of our planet and the livelihoods of people. A mobilities lens helps to make these issues visible. In support of other relational approaches, it directs our attention to how environmental problems, their politics, and their governance are interrelated and, above all, are "on the move." It zooms in on the everyday dynamics of environmental mobilities, including their composition, routes, volumes, speed, moorings, and interactions with other mobilities or mobilities systems. This provides both a

more detailed understanding of the environmental issues at hand and a more macro-level picture of how these issues connect to, escape, or are overlooked by the available governance systems. In other words, approaching environmental issues as environmental mobilities helps to broaden our ways of knowing and addressing them.

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