Abstract

Since the 1970s, urban waterfronts have undergone profound functional transformations. While in many ways they have been proven successful in reviving prime urban areas, waterfront redevelopments have also been contested. This paper reviews several aspects of the planning conflicts that have been pertinent to the redevelopment of waterfronts internationally: 1) land ownership, 2) heritage and culture, 3) social and environmental justice, and 4) environment and resilience. Based on a comprehensive review of state-of-the-art literature, we suggest that the growing concerns over social justice and environmental resilience during the course of waterfront redevelopments will continue to challenge cities in the future.

Introduction

Since the 1970s, urban waterfronts around the world have emerged as a particularly powerful and ubiquitous mode of urban development, ‘streaming’ from one location to the next (Breen et al. 1994; Gordon 1997; Erbil and Erbil 2001; Jones 2017). As the ‘borders’ between water and land and as gateways to cities, waterfro
unique challenges from a planning perspective. The competition for waterfront space, the need for public access to the shore, the economic vitality of the waterfront and the conservation of waterfront biodiversity as a natural resource have thus become increasingly prominent issues in urban policy (Sairinen and Kumpulainen 2006). Moreover, waterfront transformation processes involve the negotiation of a complex set of power relations between public and private stakeholders operating at a variety of scales and between different levels and types of government agencies (Dodman 2008; Galland and Hansen 2012; Teschner 2018). The complexity of planning and executing waterfront regenerations is what makes them an interesting terrain for investigation. This complexity also stands at the heart of this review paper, which examines contemporary conflicts in waterfront redevelopment projects from four angles: land ownership, heritage, social and environmental justice, and ecology. We believe that scholars and planners can benefit from this interdisciplinary and comprehensive review.

First, we should explain what we mean by ‘waterfront’. The terminology of urban waterfronts encompasses a broad range of definitions depending on the landscape and environment, key ones being riverfronts, harbor fronts or ports, coastal zones and beaches (Cheung and Tang 2015). Al Ansari (2009, 10) observes that while many definitions of the waterfront outline types of water bodies, a more holistic definition would describe the waterfront “as a special border type of urban zone that is both part of the city and in contact with a ‘significant’ water body” (adapted from Bruttomesso 2001, 46–48). This definition not only refers to the water but also to the interaction between the built and natural landscapes, a combination that is a key element of waterfront redevelopment projects. We accept this definition and accordingly include in
this paper redevelopment cases of various types of water bodies as well as different types of interactions between the human and built environment.

In the following sections, we will focus on planning conflicts in four main areas: a) land ownership; b) heritage, identity and culture; c) social and environmental justice; and d) environment, ecology, and resilience. These themes reflect major conflicts, which are essentially conflicts of waterfront use, stemming from the different interests that various stakeholders may have in the waterfront. While we recognize their importance, three main topics remain beyond the scope of this analysis and have been examined elsewhere: tourism (Xie and Gu 2015; Cheung and Tang 2015; Harrill 2004), institutional arrangements and partnerships for the financing and implementation of waterfront regeneration projects (Hesse 2018; Galland and Hansen 2012; Frantzeskaki, Wittmayer, and Loorbach 2014), and aspects of architecture and urban design (e.g., White 2016). The current review covers the period of the last decade (2008-2018) and, with the exception of a brief background that situates the phenomenon historically, focuses on state-of-the-art literature. Although waterfront redevelopments have been widely studied, as the background section outlines, scholarship from the last decade reveals new research directions. It should be noted that this review is not systematic; rather, we present insights from each category to reflect the overall trends in waterfront redevelopment in the planning and urban geography fields. Therefore, we draw mainly on urban planning and geography journals, though in some cases—especially in the final section of the paper, on ecology and resilience—we also included contributions from environmental studies journals in which the topic of the paper related to urban planning and land use.
Waterfront redevelopments have been extensively documented in the literature in the broad fields of geography, urban planning and design, architecture, environmental science, ecology, engineering and political science (Hoyle 2000). Academic literature from the early era of waterfront redevelopment (1980s-1990s) focused on characterizing the unique elements of this new phenomenon and the challenges of land use and administration (Hoyle 2000; Bruttomesso 1993; Gordon 1997) as well as its international spread and success stories (Breen and Rigby 1996; Breen et al. 1994; Fisher and Benson 2004; Hall 1991). Comparisons of redevelopment case studies at the national and international scales were also abundant (Jauhiainen 1995; Hoyle, Pinder, and Husain 1988; Hoyle 1995; Jones 1998). Moreover, as in the past, the majority of the available literature on waterfront redevelopment still originates from the West, notably Europe, North America, and Australia. This trend has been slowly shifting, however, as more case studies from Asia, Latin America, and the Middle East become available (while similar research from Africa, however, is limited), including cities such as Manila (Gomez and Edgardo 2008), Buenos Aires (Kane 2010) and Istanbul (Bezmez 2008; Gunay and Dokmeci 2012). Encompassing a multitude of cities and locations, our analysis of the literature reflects this trend.

While waterfronts have been studied widely from a variety of angles, few papers have addressed the waterfront redevelopment phenomenon from a synthesized approach as this paper sets out to do. In addition, while many studies focus on best practices or transferable lessons, this review, in contrast, focuses on the conflicts that shape the planning process and its aftermath. By surveying four distinct categories, this paper provides a rich and timely overview of waterfront regeneration from the unique
perspective of planning conflicts. A review of the literature from the last decade reveals that some past topics that were dominant in the 1970s are still relevant today, such as the difficulty to balance between heritage and new construction and the challenge to preserve the waterfront’s authenticity. However, our review also sheds light on novel aspects of redevelopment literature and practice, such as the growing consideration for the environment. We argue that as central and sensitive areas—institutionally, physically, environmentally and socially—urban waterfronts foment the inherent tensions between the different uses of waterfronts that require sustainable solutions. At the same time, current literature highlights that despite their urgency, these challenges are not thoroughly addressed by either policy makers or researchers. We conclude by suggesting that considering the urban turbulences of social inequalities and ecological imperilment, concerns about justice and resilience during the course of waterfront redevelopments are expected to continue to challenge cities in the following decades.

The paper proceeds in the following fashion: We begin with a short background on the waterfront redevelopment phenomenon. The review of conflicts follows next, comprising four subsections based on the four pre-identified themes. We present relevant insights on each body of literature followed by a discussion of the overall picture and concluding remarks on future research directions.

**Waterfront Redevelopments: A Brief Background**

Historically, waterfront areas have been used for industry, manufacturing and transportation. The waterfront redevelopment phenomenon has presented the waterfront with new uses such as leisure, recreation, retail, and tourism, reflecting both economic
and social needs (Cheung and Tang 2015). Whereas initially, waterfront redevelopment projects had been injected with mainly leisure and retail uses, contemporary redevelopments have been influenced by a move toward the service-economy and by a growing demand for cultural facilities as a way of ‘reclaiming the city’ (Chang and Huang 2011). Accordingly, waterfronts increasingly host cultural venues and events, and their historic value has been capitalized on to attract visitors and tourists (Kostopoulou 2013).

The emergence of waterfront redevelopments as a key theme in planning literature—and practice—began in the 1970s following the more famous of the waterfront revivals in some North American cities. Baltimore’s waterfront has been noted by many scholars as the pioneering example. Many cities followed suit, and by the 1990s, waterfront redevelopment had become a global phenomenon with projects in Sydney, Toronto, Cape Town, London and Barcelona (Shaw 2001). Many have associated waterfront redevelopments with a transition to a post-industrial, market-oriented economy, reflecting changing forms of labor and manufacturing (Porfyriou and Sepe 2017; Gene, Desfor et al. 2011). While the transition of ports presented a major planning challenge, it was also an opportunity (Hoyle 2000). Regarding the challenges, Gordon (2001, 16388) explains:

The port authorities and railways withheld their lands and interjurisdictional conflicts impeded planning. Conflicting demands for economic development, parks, and jobs increased political difficulties. The sites were often polluted and encumbered with industrial structures like grain elevators, which have heritage value but are difficult to reuse.
In a similar vein, Hein (2016) notes that cities had to develop new strategies to deal with the industrial structures, pollution, and deserted infrastructure that were typical of many inner-city ports.

It is challenging to categorize waterfront redevelopments in one analytic framework—or theme—since waterfronts differ in scale, use, purpose, geographic context, and organizational framework. Accordingly, scholars have addressed waterfront redevelopments through various categories and disciplinary perspectives (See Table 1). Yet scholars have also identified important common elements that make waterfront redevelopments a distinct form of urban redevelopment (Davidson 2009). From a political perspective, waterfronts have a significant symbolic value due to their central location: they are highly visible and often known as the ‘face’ of the city. From an economic perspective, waterfronts have served as prime locations for production and, increasingly, consumption, as well as central tourist attractions. They also share a typical context of disinvestment, once unwanted and derelict areas and today in their new role representing a high ‘exchange value’ in the form of desirable real-estate. In addition to the political and economic similarities associated with waterside locations, the sociocultural values—which refer to the perceived communal value of waterfronts—contribute to the distinctiveness of waterfronts as redevelopment sites (Davidson 2009; Bruttomesso 2001). Waterfronts are often part of the city’s inventory of open spaces, which are valued for their sensual and physical qualities and their function as spaces of community gatherings. These similarities have generated interest in the ‘waterfront’ as a distinct field or sub-field of inquiry, yielding, in turn, professional meetings, conferences, and various books and publications.
The centrality of waterfronts, their symbolic and political meaning, and potential economic value create conflicts over the use of space (see also Avni 2018b; Dandekar, 2017). The following sections will address them in greater detail.

[Table 1 around here]

**Conflicts of Land Ownership**

Land ownership and property rights patterns and their regulatory-institutional frameworks have recently become an integral topic in waterfront regeneration research, especially as that applies to waterfronts of obsolete seaport areas. Yet, even though land ownership is a continuously conflictual topic in the interaction of municipalities and ex-industrial entities such as seaports, the current body of literature about this topic is still small (Daamen and Vries 2013; Eidelman 2018; Girard, Kourtit, and Nijkamp 2014).

Regeneration in the city is to a large extent dependent on historical patterns of land ownership and property rights, that is, the “collection of rights to own, occupy, use or improve space and to lease, sell or pass it on to one’s heirs” (Kivell 1993, 93). In the urban context, land ownership fragmentation is known to play a crucial role in development projects as a key characteristic of their purpose, nature, the pace of implementation, and economic structuring.

Although land ownership is a legal matter, it is, in fact, a broad category that covers different conflicts that stem from land-use changes, including the conversion of industrial land for urban use such as housing or recreation; the conversion of agricultural land for port or industrial use; the purchase of municipal land by the port authority or
port-related industries; instances of land use designation or zoning changes involving industrial or waterfront land; or cases of undetermined jurisdiction over lands involving port or logistic activities (Felsenstein, Lichter, and Ashbel 2014; Hall 2014). While some land-use changes are easier to implement, the literature suggests that there is inherent tension between port operation and development and the city’s urban functions, such as housing or recreation (Ducruet 2009; Van den Berghe, Jacobs, and Boelens 2018). This tension has been termed the ‘port-city interface’. In many port cities, waterfront regeneration takes place in what used to be a “gray zone” of decay and conflict (Ng and Ducruet 2014).

Bunce and Desfor (2007) argued a decade ago that, in a growing number of places, the interests of shipping companies, port authorities and related industries have been in line with urban development intentions over the determination of primary land uses along the waterfront. Yet, despite Bunce and Desfor’s assertion that “those earlier battles have been largely won by proponents for residential, entertainment, leisure and mixed-used commercial developments” (2007, 2), research has found that conflicts over land use are far from being settled (Calabrò, Rugolo, and Viglianisi 2018; Debrie and Raimbault 2016).

Despite the fact that very often shorelines, coastal zones and riverfronts are publicly owned, segments of land can be owned and controlled by different public entities (such as port authorities, the army, federal government, local development authorities, etc.). This fragmentation requires massive resources for coordinating and engaging stakeholders. While the academic literature typically does not examine the issue of fragmentation at such high resolution, professional reports are rife with examples (see,
for example, Washington, D.C’s Anacostia Waterfront Initiative in a World Bank report, in Amirtahmasebi et al. 2016). Additionally, the status of the land as publicly owned does not guarantee that governments will act in the public interest or that they will include local actors in the planning processes for regeneration along the waterline. Bellas and Oliver (2016) show how the public nature of Toronto’s waterfront land has rendered the process a formidable challenge, with key properties being held by entities from different levels of government that are reluctant to participate in the negotiations.

Research has attributed different meanings to the effects of land ownership type (as opposed to rights of use) on planning processes dedicated to properties in the proximity of urban waters. Teschner (2018) suggests that public ownership in waterfront redevelopment plays a symbolic, rather than a pragmatic, role, because a definition of a public domain may embody a certain ideology that supports and promotes principles such as common use and open access. Although this symbolic meaning may only apply to the legal arrangements in a particular context, notions of common use and open access are values that, in the longer term, may influence planning processes, public engagement, and court decisions. Alternatively, Ng and Pallis (2010) have emphasized the practical impact that type of land ownership has on land-related issues. They demonstrate how various types of public land ownership—particularly national government versus municipal government—directly related to the ability of stakeholders to influence land-use planning, development projects, and infrastructure investments in port zones. For example, in Rotterdam, the municipal government owns the land, and therefore, was intimately involved in the construction of infrastructure, the introduction and enactment of port-related laws and regulation, and the provision of assistance to the port in terms of
networking and marketing. In contrast, in Piraeus, where the Greek national government is the owner of the port land, the municipal government has, according to the study, only limited involvement in the construction of the infrastructure, a scenario that has led to conflict between the two.

Eidelman (2018, 718) has also examined the relationship between public land ownership and the long-term processes of urban waterfront redevelopment in three North American cities. He, too, has found that “it remains uncertain whether public land ownership, in itself, either aids or obstructs urban development”. Still, he emphasizes that the consolidation of ownership by one or two landowners (either public, private or both) was a necessary condition for project success while fragmented land ownership almost certainly led to a project’s failure.

Despite the critical influence that statutory ownership may have on the effectiveness of the planning and implementation of regeneration projects, there is a potential circumvention. In Spain, for example, although state law prevents the transfer of strategic coastal land from state control to control by other entities, in the Barcelona model that Daamen and Vries (2013) present, the key to the city’s successful waterfront redevelopment project was to transfer the management and operation rights of the new leisure area along the waterfront of the port to the Port Authority. As will be further discussed, other land-related conflicts are less amenable to such compromise.

Conflicts of Heritage, Identity and Culture
Conflicts of heritage, identity and culture are at the center of the voluminous literature created from the very start of the waterfront development phenomenon until today, encompassing physical and cultural aspects as well as different areas of the world (Marshall 2001; Oakley 2005; Steinberg 1999). As industrial waterfronts have been repurposed as areas of recreation, housing, tourism, and leisure, contentions have emerged around old versus new—including structures, land use and the inhabitants and users of the revitalized space. Over time, as the phenomenon of waterfront redevelopment spread to different parts of the world (Hoyle 2000), planners developed the expertise to engage with these unique built and human environments. A classic example of such engagement that has been repeated around the world and that facilitates the incorporation of contemporary uses into former industrial zones is the conversion of warehouses to museums and marketplaces (Atkinson, Cooke, and Spooner 2002). And yet, tensions between development and preservation remain ubiquitous in waterfront redevelopment projects.

Porfyriou and Sepe (2017, 6) note that the shift from the waterfront as a site of production to a site of consumption can be a source of contention as well as a “misuse” of heritage values. In that, they mean that the new essence of the waterfront as a hub of culture, tourism and consumerism may threaten the conservation of old docks or warehouses, despite interventions dedicated to preservation. In other words, the market-led approach that dominates waterfront redevelopment projects globally can be at odds with historical preservation. This was the case in the Golden Horn Cultural Valley redevelopment in Istanbul, for example, which has led, on the one hand, to greater economic vitality and an increase in cultural amenities available to the public (Gunay and
Dokmeci 2012). On the other hand, the fast rate and scale of development has threatened the conservation of historic waterfront neighborhoods to such an extent that UNESCO suggested to include the area in its List of World Heritage in Danger. Nonetheless, these grim results are not omnipresent, as some developments prioritize the historic fabric, landscape and identity of the city. A notable example is HafenCity in Hamburg, the largest waterfront development to date, which is widely considered to be a case of successful culturally sustainable development (Sepe 2013).

Reclaiming local history, authenticity and cultural identity is an important feature of waterfront developments, as Chang and Huang (2011) demonstrate through the Singapore Riverside case. They note that tourists and locals might have different expectations regarding their respective interests in the waterfront: while visitors are interested in vernacular architecture, food and traditional boats, locals seek modern, global cuisine and facilities. In its efforts to gain further worldliness and prestige, Singapore has compromised the unique heritage of the river. “For tourists who have traveled considerable distances to Singapore”, the authors note, “encountering yet another ‘global’ landscape is disappointing” (Chang and Huang 2011, 2096). Likewise, Giblett and Samant (2012), reviewing projects in global Asian port cities, contend that the unique identities of many waterfronts are being lost to homogenization. As different cities look up to the same development models, similar urban environments are reproduced, all conforming to a universal image of the waterfront (Cook and Ward 2012). Thus, heritage preservation should not be directed solely at tourists – balance must be sought to accommodate the variegated needs of the different groups that frequent the waterfront.
Past literature has pointed to the difficulty of maintaining the nature of the working port in developments that prioritize lifestyle and entrepreneurship. Studies from across the globe have shown that heritage is often confined to tangible aspects, such as the reuse of old buildings and/or museums by preserving their industrial facades while introducing new contents of retail and recreation. This challenge is still reflected in recent literature. In the ancient Jaffa Port, Israel, both tangible and intangible aspects of heritage have been a subject of conflict (Avni 2017). While planners have initially envisioned small changes to the built environment, the resulting space has been perceived as alienating by local residents and fishers. Moreover, the fact that the port still operates as a fishing port has fomented conflict between visitors and fisherman over the use of the space: the latter feel that the port’s new recreational role threatens their livelihood.

The tension between the waterfront as a traditional space of work and community versus its new use as a space for luxury condominiums is also demonstrated in the Dublin Docklands, where new communities have been formed in an area previously dominated by those dependent on the port economy (Wonneberger 2011). Heritage conservation is a selective process; when formerly industrial waterfronts are filled with housing condominiums and parks, they become spaces of “non-work” (Hall and Stern 2018, 78) and lose some or all of their industrial identity. Hall and Stern argue that as rivers are ‘reconnected’ to cities, their industrial heritage is lost and the working-class residents’ knowledge of the city is depreciated and overlooked.

In a recent paper, Oakley and Johnson (2013, 341) suggest a post-colonial read of the waterfront, which addresses “the role of waterfronts as imperial beachheads, entry points and bases for the realization of colonial ambitions”. Using case studies from
Adelaide and Melbourne, they shed light on how indigenous presence is symbolically represented in the built environment through arts, street names, and parks, yet absent from more substantial forms of recognition. Wessells (2014) also examines the inclusion of indigenous people and culture in the redevelopment of Seattle’s waterfront, also noting that recognition tends to be limited to interpretive gestures such as plaques or installations of public art, and asking how it can be made more meaningful. However, research on indigenous heritage in current waterfront developments is still scarce.

Conflicts of Social and Environmental Justice

Waterfront redevelopments convey another inherent conflict as reflected in notions of social and environmental justice. On the one hand, they create opportunities to foster social and environmental justice by means of high-quality public spaces, access, and proximity to nature. On the other hand, they often beget upscale environments that potentially exclude large publics from the revitalized space and inscribe in the urban landscape certain values and memories over others (Samant and Breares 2017; Cheung and Tang 2015). In the last few decades, a large strand of the literature has examined waterfronts as products of neoliberal and entrepreneurial regimes, geared toward economic profitability and competitiveness (Boland, Bronte, and Muir 2017; Oakley 2009; Swyngedouw, Moulaert, and Rodriguez 2002; Mele 2013; Thorning, Balch, and Essex 2019). Scholars have documented how waterfronts have been transformed into spaces of spectacle (Broudehoux 2013), creative milieus (Kostopoulou 2013) and innovation districts (Kayanan, Eichenmüller, and Chambers 2018). Many of these works have centered on the social implications of waterfront developments, noting that
‘reclaiming’ the waterfront (Chang and Huang, 2011) can have potentially negative impacts, such as the exclusion of residents and the privatization of space (Desfor et al. 2011; Dodman 2008). Moreover, Boland et al. (2017) argue that the often touted public benefits of waterfront developments are questionable, as they conflate the public at large without giving special consideration to the least well-off members of that public.

While critical scholars have documented these transformations for several decades, only recently have they begun to apply more extensively explicit concepts of justice and equity in their investigation of urban waterfronts (Wessells 2014). Increasingly, waterfronts have been engaged with from the perspectives of both social and environmental justice, but the two terms have rarely been discussed in integration (Avni and Fischler, 2019). The lens of environmental justice is important to the analysis of waterfronts since as former industrial zones (and in some cases, current industrial zones), they have suffered from contamination, pollution and overall neglect. Accordingly, neighboring communities in many areas have been burdened with these issues while simultaneously being denied the ability to enjoy and utilize the natural amenities in their immediate area (Smardon, Moran, and Baptiste 2018). Waterfront revitalization allegedly solves this problem by improving the environment and connecting communities to their water resources, but redevelopment processes typically entail a social cost that is not immediately evident (Miller 2016). In particular, the growing scholarly engagement with sustainability and green gentrification in the last two decades has helped to unpack the social impacts of substantial greening interventions such as waterfront parks, especially when they are executed in proximity to marginalized communities (Bryson 2013; Curran and Hamilton 2017; Gould and Lewis 2017;
A social justice lens is equally important to critically evaluate who has a voice in the process, who benefits and who loses from revitalization, and whether it promotes equity or, alternatively, perpetuates injustice (Avni and Fischler, 2019).

Using the Seattle Waterfront as a case example, Wessles (2014) examines the idea of “doing justice” on the waterfront beyond its manifestation in the physical features of the site by assessing important elements such as access, regional equity, and affordability, which are not always included in such analyses. She employs the four pillars of sustainability to frame her discussion around the economic, environmental, social, and tribal aspects of justice as they manifest in the case of Seattle’s redeveloped waterfront. She concludes that despite some benefits, the plan for Seattle’s waterfront would need to foreground important components of justice such as inclusion, diversity and sustainable development to be considered truly just. Beatley (2018, 2014) also argues that social justice is a key parameter in so-called Blue Biophilic Cities, and he introduces the concept of "equigenic blue", according to which enhanced access to blue (i.e., marine) nature can help alleviate other forms of social and health inequality. While Beatley provides examples of successful projects that have brought communities closer to their respective bodies of water (e.g., port, river, ocean, etc.), he also cautions that a “just blue” agenda should also ensure that new waterfront parks do not displace local residents.

The tension between the positive and negative impacts has been critical to the study of waterfront redevelopments, especially from a justice perspective. In the last decade, analyses of the benefits and drawbacks of waterfront redevelopment have featured widely in the growing literature about green, ecological or environmental
gentrification, which notes the social, and potentially negative, impacts of urban greening interventions (Anguelovski 2016; Mueller and Dooling 2011; Gould and Lewis 2017; Rigolon and Németh 2018). As defined by Gould and Lewis (2012, 121), green gentrification is assisted by the “creation or restoration of an environmental amenity”, such as a waterfront park. Pearsall (2018) lists waterfront redevelopment as a category of environmental gentrification catalysts, which also include elements like bike infrastructure and brownfield redevelopment. As greening formerly industrialized waterfronts has become a growing trend, this body of scholarship demonstrates that green amenities are actively and purposefully used by policymakers to tailor environments to wealthy clienteles, frequently at the expense of longtime residents. Since waterfronts are often in proximity to poor and/or racial minority communities, greening strategies can create a paradox: as waterfront sites are cleaned up, beautified and become more accessible, they become inaccessible to their communities, whose members are no longer able to reside there.

Several cases from India suggest that waterfront and riverfront redevelopments serve as pretexts for the displacement of informal settlements. The polluted Yamuna River has been cleared of slums along its floodplain, presumably for the sake of its environmental remediation, but essentially to rebrand Delhi as a world city by implementing mega-projects in the same area that was emptied of its informal residents (Follmann 2014; Sharan 2016). Yet such seemingly premeditated displacement is certainly not confined to the global south.

Research has shown that in various cities around the world, profitability considerations often supersede equity ones in waterfront redevelopment projects and in
other greening ventures (Anguelovski 2013; Avni 2018b). Andersen and Røe (2016) find that although social sustainability was an explicit planning goal in the design of the Barcode project in Oslo’s waterfront, the architects did not prioritize it in the design process—placing emphasis, instead, on spectacular architecture. As a result, they write, it is not clear how the project “would contribute to the larger city and the adjacent areas in terms of accessibility, equity, social sustainability or the improvement of living conditions” (Andersen and Røe, 2016, 11). Avni (2017) similarly shows that even in cases where planners and policymakers have expressed commitment to justice in waterfront projects, outcomes suggest that waterfront redevelopments still place marginalized residents at risk of displacement and, in some cases, of losing their livelihood. Tasan-Kok and Sungu-Eryilmaz (2011, 70), in exploring tools for socially sustainable waterfront regeneration in Antwerp and Rotterdam, conclude that the projects under examination “have lacked clear social sustainability policies to address inequality, discontinuity, and exclusion”, despite partial adoption of tools such as Community Benefit Agreements and Community Land Trusts. The authors note that the desire of policymakers to render the waterfront area attractive to higher income groups has taken precedence over goals of improving social conditions. Similarly, in two port cities in the United Kingdom, social mixing has not been very successful due to the prioritization of economic growth goals (Thorning, Balch, and Essex 2019). In China’s port cities, Wang (2014) determines, planners and local authorities have completely disregarded social sustainability considerations.

At the same time, the literature shows that the outcomes of waterfront developments are not unanimous. Brownill (2013) maintains that viewing waterfronts
from a sweepingly negative perspective neglects their potential to fulfill social functions such as affordable housing, community gathering spaces and community land trusts. Rubin (2011, 143) argues that in San-Francisco, the waterfront “provides an example of a relatively successful struggle to emphasize public and civic space instead of accumulation and spectacle”. Avni (2018a) analyzes a planned elevated waterfront park in Washington, D.C., and while she notes the contested elements of the project, she also emphasizes steps taken by planners to increase equity, such as an Equitable Development Plan and a Community Land Trust. Pinch (2015) cautions that neoliberalism should not be cast as a hegemonic and singular force that dictates development along the River Thames. Jones (2017) identifies a positive trend in redevelopments of the post-2000s, where greater emphasis is placed on social sustainability compared to similar projects from the 1980s and 1990s. Smardon, Moran and Weiss (2018) review several cases of urban waterway restoration where attention has been given to community mobilization, ownership and inclusivity. Finally, Miller (2016) notes that based on their socio-economic status, personal preferences and their understanding of the anticipated risks and/or benefits, some local residents might support waterfront redevelopment while others will contest them.

While not applying explicitly the concepts of social and environmental justice, Smith and Ferrari Soledad Garcia’s (2012) edited book, Waterfront Regeneration: Experiences in City-building, tests models for sustainable, collaborative and inclusive planning around the waterfront. In this book, the authors summarize the Waterfront Communities Project, a European Union-funded action-research model that they undertook in nine port cities around the North Sea from 2004-2007. The findings from
the case studies are varied, yet they support the arguments raised in recent literature about
the multifaceted nature of the waterfront, which is compounded not only by economic
issued, but also by social and environmental concerns.

In summary of this section, urban waterfronts are once again attractive
destinations, filled with potential for social and environmental gains. However, as evident
in the literature, the success of this trend brings new challenges, pertaining to the social
implications of these projects. The opening of these areas to the public and the growing
investment in environmental remediation, public spaces, and facilities, however, may
counteract the perceived benefits of redevelopment “if the revitalized landscapes become
new areas of exclusion” (Avni and Fischler, 2019, 25).

Conflicts of Environment, Ecology and Resilience

As places where land and water meet, waterfronts are unique contact zones
between human and non-human environments from the perspectives of sustainability,
resilience and ecology (Bunce and Desfor 2007; Cotado, Kotval and Franco 2013;
Portman, Jin, and Thunberg, 2011). While the natural environment of the (urban)
waterfront has many benefits—providing areas for recreation and contemplation and
beautiful vistas—often it has also been left in a degraded state due to past industrial
activity. Indeed, industrial activity is important, and urban waterfronts fulfill important
strategic and economic functions not only in the urban sphere, but also at regional and
national levels. Yet the contaminated state of many waterfronts poses challenges to
quality of life issues (Borriello, Borriello, and Filomena 2013). In addition, waterfronts
are highly risk-prone areas, a fact that is often disregarded in development practices due to the high desirability of these settings.

Scholars have been occupied with diverse issues that pertain to the ecological role and sensitivity of urban waterfronts, such as restoration of shoreline habitats and wetlands, stormwater management, biodiversity, flood control, ecosystem services and storm protection. In light of the anticipated impacts of climate change and following extreme weather events that have had significant effects on the urban environment (e.g. Hurricanes Katrina and Sandy), researchers have argued that more attention should be paid to the ecological and natural aspects of waterfront redevelopments to improve the ecological resilience of aquatic cities (Girard, Kourtit, and Nijkamp 2014; Everard and Moggridge 2012). However, questions about water quality, the effects of rising sea levels, pollution, waste management and ecology and their relation to the urban sphere are still under researched in the fields of urban geography and planning (Hein 2016).

Vollmer (2009) posits that the ecological values of waterfronts are undervalued despite their uncontested environmental, cultural and recreational contributions, since preference is given to human activity over other factors. As a result, ecological restoration of waterfronts is typically a low priority for governments, especially in the developing world where more urgent needs take precedence. He examines three projects in China where major investment has been channeled into improving the watershed and finds that even though environmental protection is not the main factor that drives redevelopment, incremental improvements can be made and some balance between the economic and ecological value of waterfronts may be achieved. Storbjörk and Hjerpe (2014) find that waterfront planning that is driven by climate change forecasts is
influenced more by the political and economic desirability of the area for development than the by the actual climate risks that threaten the area. Indeed, climate risks can serve as an alleged reason for leaving an area undeveloped or, alternatively, they can be disregarded when an area is highly sought after. Similarly, Gould and Lewis (2018) argue that development plans are advanced despite hazards such as storms and floods, since the demands of the real-estate market triumph over concerns about adapting to climate change. Giblett and Samant (2012) caution that in many Asian cities, waterfront developments are advanced through landfill reclamation projects, which bear immense environmental risks such as sand and reef disturbances. Yet cities increasingly promote these projects due to real-estate pressures and economic interests.

Dyson and Yocom (2015) surveyed the literature to evaluate the different approaches to the ecological restoration of waterfronts. They emphasize the immense potential of aquatic environments to provide a host of ecosystem services, their special role as habitats, and the value of conserving and rehabilitating them. Their review—focusing on topics such as microhabitats, sedimentation and non-native species—provides examples for successful designs and evidence that introducing design strategies to existing structures can enhance the quality of their ecosystem functions and services. However, more research is needed on these topics, especially as challenges like climate change, ocean acidification and sea level rise continue to evolve.

The environmental aspects of waterfront developments have also been approached through broader studies about greening brownfields, such as De Sousa’s (2014) work on the South Waterfront in Portland. He notes that in the last decade, there has been a growing trend of greening post-industrial spaces and a larger recognition and
inclusion of ecological features in redevelopment projects. In Portland, “Declining water quality and habitat degradation in the Willamette River, as well as a shortage of public space... motivated the city to explore greening efforts that would renew the river ecology while providing waterfront access... to the public” (De Sousa 2014, 1058). In metropolitan Vancouver, in contrast, planners and policymakers have embraced a discourse of sustainability and livability to advance investments and developments that are in fact not sustainable in any scale, local or regional (Hall and Stern 2014).

The work of Bautista et al. (2015) sheds light on a pivotal aspect of waterfront redevelopments—climate justice—that nonetheless has been little explored to date. By reviewing the advocacy and research of the Waterfront Justice Project, led by the nonprofit organization The New York City Environmental Justice Alliance (NYC-EJA), the authors examine the extent to which the vulnerability of industrial waterfront communities is considered in policymaking that is driven by local climate change forecasts. The project aims to create climate-resilient industrial waterfronts through innovative zoning and regulations. While this is a critical topic that has not been addressed by the city, the authors find that despite some success, the advocacy project experiences bureaucratic and administrative challenges. Thus, reducing the vulnerability of the industrial waterfront to climate change impacts “will take time” and “require long-term commitments from industry, government, and the communities working and living in and around” the area (Bautista et al., 2015, 835).

The difficulty of integrating climate change adaptation in waterfront planning is also echoed in Smith and Ferrari Soledad Garcia’s (2012) work on waterfront planning in port cities around the North Sea. From a different angle, Daly (2015) cautions that
climate change can be a threat to a waterfront’s industrial heritage: for example, New York City is highly susceptible to flooding and hurricane hazards, and the industrial buildings situated along its waterfront are particularly exposed. Cities must respond to this challenge by introducing innovative climate adaptation techniques to ensure historic preservation, among other goals.

Borriello et al. (2013) contend that municipalities and port authorities must join hands to secure environmental protection, health, and a good quality of life for urban residents. They list Valencia as a good example of a city that has adopted strategies for environmental rehabilitation that were coupled with considerable social and economic gains. To monitor the impacts on the environment and to develop concrete actions in predefined areas they propose an Environmental Accounting tool. A small body of literature has examined waterfront redevelopments, especially riverfronts, in the context of renaturation, that is, the process of restoring an aquatic system to the extent that it can fulfill its main ecological capacity. Thus, renaturation does not necessarily entail full restoration, but it includes a range of approaches to managing aquatic systems. It is a complex and costly process that requires the collaboration of several types of stakeholders. Research by Brun (2015) shows that the interest in renaturation typically stems from urban redevelopment schemes rather than from pure ecological motives. And yet, renaturation may confer substantial benefits on the public through improved access to nature.

Concluding Notes: The Shape of Water(fronts)
No longer a new phenomenon, waterfront redevelopments have been around for over fifty years now (Meyer 1999; Wrenn 1983). The transformation of these unique areas—a task that included myriad initial challenges—has been mainstreamed and applied in multiple settings (Bruttomesso 1993; Hall 1991; Hoyle 2000; Smith and Ferrari Soledad García 2012). Accordingly, academic scholarship has been slowly shifting from early accounts that focused on ‘how to undertake waterfront redevelopments’ in different cities (Breen et al. 1994; Fisher and Benson 2004; Hoyle, Pinder, and Husain 1988) to ‘how to make the process more socially and environmentally sustainable’ (Beatley 2018; Smardon, Moran, and Baptiste 2018).

This paper has revolved around four main conflict themes in contemporary waterfront redevelopment endeavors: land-ownership; heritage, identity and culture; social and environmental justice; and environment, ecology and resilience. The section about land-ownership shows that to date, little research has been devoted to the details of legal arrangements despite their significance in the regeneration process. Fragmentation of land ownership was found to be one of the prime obstacles in the redevelopment process, even in cases in which the bulk of the land is defined as public. Moreover, land ownership status was found by studies to have both symbolic and pragmatic implications on the ability to foster coordination between, and engagement of, the different stakeholders along the waterfront.

The review of publications on heritage, identity and culture emphasizes that even though planners tend to recognize the historic features of the waterfront and use its heritage as a selling point, the spirit of the place is often lost and an organic balance between old and new is often difficult to achieve. In the section about social and
environmental justice, we have demonstrated how these concepts have increasingly been used to analyze and evaluate waterfront redevelopments, taking into account components of inclusivity, access, and affordability. On the one hand, waterfront redevelopments may benefit the public, but on the other hand, they may lead to further marginalization of disadvantaged populations.

Finally, the discussion about environment, ecology and resilience reveals that even though the waterfront’s ecological qualities are sensitive and significant, they are under researched in the planning field, and developments are often carried out with little consideration of their environmental implications and with little reference to the precarious aquatic environment. This is particularly problematic given that waterfront zones are prone to climate risks.

Although we have suggested four different themes to explore conflicts over waterfront use, in practice, these topics intersect in different ways. We have shown, for example, how the planning of more environmentally sustainable waterfronts through cleanups and the introduction of new green technologies can lead to what researchers have termed ‘green gentrification’ of waterway spaces. Thus, gains in the environmental sphere can translate into new domains of conflict in the social sphere. Heritage and culture also influence social justice issues, as the selective preservation of some features of the waterfront, as well as the development of new ones, may lead to the exclusion or marginalization of more traditional users of these spaces. Unsettled land ownership is an overarching conflict, which may precede and accompany various planning-related conflicts. While we have treated each category as independent for analytical reasons, we recognize the mutual connections between them.
While this review is thematic and not chronological, it nonetheless elucidates the chronology of some trends in the research and practice of urban waterfront redevelopment. Some of the issues in this review have already been thoroughly researched over the last five decades. These include conflicts of heritage preservation, ownership, and contamination. Yet our review also sheds light on new ‘waves’ of studies, predominantly in the areas of land ownership, social and environmental justice and sustainability. There is greater awareness nowadays of environmental risks, such as climate change and sea level rise, and more attention is placed on the links between environmental remediation and socio-economic changes. Still, issues of ecology and resilience are under researched in the planning literature. We expect that future research on waterfront redevelopments will build on this gap of knowledge, providing scholars and practitioners with a better understanding of how to plan sustainable waterfronts on all fronts: physically, economically, administratively, socially and environmentally.

References


Berghe, Karel Van den, Wouter Jacobs, and Luuk Boelens. 2018. “The Relational Geometry of the Port-City Interface: Case Studies of Amsterdam, the Netherlands,


Interplay of Informality, Flexibility and Exceptionality along the Yamuna in Delhi, India.” *Habitat International*, 1–10.


Storbjörk, Sofie, and Mattias Hjerpe. 2014. “‘Sometimes Climate Adaptation is Politically Correct’: A Case Study of Planners and Politicians Negotiating Climate Adaptation in Waterfront Spatial Planning.” European Planning Studies 22 (11):
2268–86.


<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
<th>Examples of research topics</th>
<th>Examples of references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning practice</td>
<td>Early literature on implementation of redevelopment projects in various cities, which largely preceded theoretical and/or critical analysis.</td>
<td>Success stories, practitioners’ experience, financing issues, urban planning strategies</td>
<td>Gordon, 1997; Bruttmesso, 1993; Breen, 1994, 1996; Meyer, 1999; Fisher and</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>Research Focus</td>
<td>References</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>----------------</td>
<td>------------</td>
</tr>
<tr>
<td>Neoliberalism</td>
<td>While this is a wide category, research on the ‘neoliberal waterfront’ pays attention to institutional and administrative arrangements that facilitate the transformation of the waterfront from a predominantly space of production to a predominantly space of consumption. This large body of scholarship views the waterfront as a prime city area, where symbolic, political and economic considerations typically supersede public benefit ones.</td>
<td>Research on public-private partnerships, institutional arrangements, planning processes, gentrification, mega-events</td>
<td>Boland et al., 2017; Kayanan et al., 2017; Oakley, 2009; Swyngedouw et al., 2002; Broudehoux 2013; Kostopoulou 2013; Rubin 2011; Lehrer and Laidley 2008; Mele 2013</td>
</tr>
<tr>
<td>Justice and equity</td>
<td>This body of research focuses on the implications of waterfront redevelopment for social and environmental justice, with emphasis placed on marginalized communities. These studies examine to what extent considerations of justice play a role in development plans and their outcomes.</td>
<td>Civic engagement, access, public space, (green) gentrification and displacement</td>
<td>Wessells 2014; Samant and Breares 2017; Avni and Fischler 2019; Miller 2016; Gould and Lewis 2017; Smardon, Moran and Eiss 2018; Beatley 2014, 2018; Pearsall 2018; Vollmann 2014; Tasan-Kok and Sung-Eryilmaz 2011; Sharan 2016</td>
</tr>
<tr>
<td>Environment</td>
<td>Research that focuses on the environmental aspects of the waterfront, approaches it as an ecosystem and places emphasis on its ecological characteristics. This body of work addresses the interaction between the human and natural environment, and prioritizes the physical qualities of the blue space - often with references to resilience and sustainability.</td>
<td>Research on renaturation, climate-change adaptability, ecological design, waste-management and flood management</td>
<td>Bunce and Desfor 2007; Borriello, Borriello and Filomena 2013; Girard, Kourtit and Nijkamp 2014; Everard and Moggridge 2012; Hein 2016; Vollmer 2009; Storbjörk and Hjerpe 2014; Gould and Lewis, 2018; Giblett and Samant 2010; De Sousa 2014; Hall and Stern 2014; Bautista et al. 2015; Brun 2015</td>
</tr>
<tr>
<td>Transport Geography and land use</td>
<td>Port research is a well-established subfield in transport and land use geography, with some studies on the port-city interface. This terms expresses conflict over demarcation of ports versus urban land-uses; over the planning and construction of inland transportation lines; or the location of economic structures, employment and services.</td>
<td>Research on economy and markets, shipping and logistics chains, regional development, land-use and planning</td>
<td>Hoyle, 1989; Daamen and Varies, 2013; Lee et al., 2008; Van den Berghe et al., 2018; Teschner 2018; Zhao et al. 2017; Eidelman, 2016; Felsenstein, Lichter, and Ashbel, 2014; Ducruet 2009; Calabrò, Rugolo, and Viglianisi 2018; Debreie and Raimbault 2016</td>
</tr>
<tr>
<td>Culture and heritage</td>
<td>Research that centers on tangible and intangible aspects of heritage, e.g., historic preservation, livelihood and culture. Scholars highlight the tensions that often accompany the changes in the form and function of waterfronts with emphasis on identity issues.</td>
<td>Historic preservation, cultural districts, livelihood, tourism</td>
<td>Oakley 2005; Steinberg 1999; Porfyriou and Sepe 2017; Gunay and Dokmeci 2012; Sepe 2013; Chang and Huang 2011; Cook and Ward 2012; Avni 2017; Oakley and Johnson 2013; Jones 2017</td>
</tr>
</tbody>
</table>