



Supply vessel entering the port of Appilatoq, Greenland

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Marine island economies:

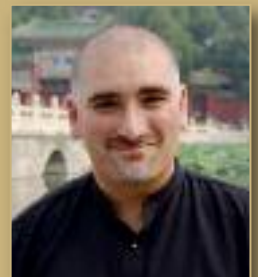
Drivers, roles, and challenges

ABSTRACT

Islands may be defined by a particular relationship between land and water, but discussions of island development often focus on either land-based activities or on sea-based activities, with little attention to how the terrestrial and marine realms interact. This chapter argues that islands possess a number of spatial characteristics related to coast/area ratios, land scarcity, comprehensive coastlines, transport benefits, and territorial benefits that serve as drivers for the marine economy and that boost marine island economy competitiveness. Today's marine economy is, however, dependent upon onshore

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infrastructure; labour; expertise; and healthy and stable ecological, social, and political environments, none of which can simply be taken for granted. The very factors that make islands ideal for hosting marine activities—such as an extensive land-sea interface and density-facilitated agglomeration economies—may be placed at risk by marine economy-oriented island development. It is thus that economic activities on the land-sea interface—whether port services or coastal tourism—can reduce islanders’ access to the sea as well as lead to environmental degradation that threatens the continued viability of the economic activities in question. Those pursuing island development should take care to balance short-term and long-term objectives while leveraging the very real competitive advantages that arise from island spatialities.

INTRODUCTION

Recent years have shown an increasing emphasis within Chinese research on defining, quantifying, and assessing the marine economy as well as its relationship with the wider economy (e.g., He et al., 2018; Wang & Wang, 2019; Yang et al., 2016; Yin et al., 2018). As China moves into a new stage of industrial development, it becomes increasingly important to understand how economic processes on land and in the sea interact.

This would seem to highlight the importance of taking a marine economy approach to islands, which are fundamentally defined by a particular relationship between land and water. Nevertheless, discussions of island development per se have often focused on either land-based activities or on sea-based activities, with little attention to how the terrestrial and marine realms interact. This chapter seeks to provide a framework for understanding marine economy processes on islands and in archipelagos, laying the groundwork for future quantitative and data-driven studies on how to optimize marine island economic outputs over long periods and for the benefit of the wider society. The chapter will discuss how a place’s island status can affect the marine economy as well as how the marine economy may interact with various aspects of islandness to produce wider social, cultural, economic, and political impacts.

THE LAND-SEA INTERFACE

When it comes to understanding the meaning of ‘islandness’, it is the interface between land and sea—and the ways in which this interface is approached and exploited—that is significant. A place’s status as an island only matters to the extent that its land-sea interface is activated. One manner in which this land-sea interface can be activated is when an island’s comprehensive coastlines are used to create mental borders, as shall be discussed below in the context of island territoriality. Such bordering practices represent a way in which people—both island residents and outsiders—may work to isolate an island from its surroundings. The land-sea interface

can also, however, be used to connect an island with its surroundings, both with other pieces of land and with the sea itself.

The marine economy encompasses a great variety of industries. It is vital to recall, however, that the marine economy is not just about the sea. For all the talk of an increasingly seamless global economy, the vast majority of marine activities continue to require onshore infrastructure and facilities, not to mention labour, resources, and consumers. It is because of this that islands—particularly small islands—often have a crucial advantage in the marine economy. Although coastal zones in mainland areas provide an interface between land and sea, this interface is exceptionally comprehensive on small islands, where all areas provide close access to the water. Thus, for example, Hainan, a large island, has around 1,800 km of coastline and a land area of 35,000 km², resulting in a coast/area ratio (m/km²) of around 51 (Zhao et al., 2017). Meanwhile the relatively small and elongated islands of the Zhoushan archipelago have around 1,200 km of coastline and a land area of 1,000 km² (Qiu et al., 2017), resulting in a coast/area ratio of around 1,000. All else being equal, high coast/area ratios represent enhanced accessibility of the sea from the average point in a territory and are beneficial for the marine industries and industries directly or indirectly related to them.

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Frequently, however, all else is not equal. It may be that a long stretch of coastline on the mainland or on a large island provides superior conditions for industry than does the coastline of a small island that lacks land for development. Indeed, extreme land scarcity is a characteristic of small islands and would seem to inhibit development of the marine economy. Although some marine industries are relatively undemanding in terms of land use, others require the allocation of significant terrestrial space. Whereas a subsistence fishing economy requires little more than a protected beach, residential housing, and basic processing facilities, a modern, export-oriented fishing economy with some degree of local processing both consumes more terrestrial space and requires a greater degree of infrastructural development.

This might seem to place small islands at a disadvantage, yet it seems that lack of developable land is itself a driver for the marine economy on small islands. This is in part because many alternative industries are equally if not more demanding of space. For example, terrestrial primary-sector activities (agriculture, forestry, mining, etc.) tend to be highly land-intensive. As such, even if land scarcity places small islands at an immediate disadvantage relative to mainlands and large islands as far as the marine

economy is concerned, small island spatiality nevertheless encourages development of the marine economy because marine industries remain more feasible than alternative terrestrial industries.

It is also necessary to consider the effect of comprehensive coastlines on territorial seas and exclusive economic zones (EEZs). Here, even islands with relatively low coast/area ratios possess a distinct advantage over mainland territories in terms of control over marine resources such as fish and minerals beneath the sea bed. Widely dispersed archipelagos such as French Polynesia and Kiribati can create enormous EEZs. In the case of independent states or highly autonomous subnational island jurisdictions, this can result in a regime of local resource exploitation and/or the sale of quotas and licenses to overseas businesses or jurisdictions. In the case of islands and archipelagos that are fully integrated into a mainland jurisdiction, the presence of extensive adjacent marine territory also has the potential to create considerable employment onshore.

These issues explain in part why even islands with poor natural harbours and/or difficult landscape features for development may be pushed in the direction of the marine economy. For example, both the small subtropical island of Lanyu/Pongso no Tao (southeast of the large island of Taiwan) and the enormous arctic archipelago of Greenland are strongly reliant on fishing while increasingly looking to coastal nature and cultural tourism to generate foreign exchange: not because their coastal zones are particularly easy to develop for fishing harbours, tourism accommodation, and ancillary services but because it is easier to develop the mountainous and difficult landscape for these industries than for alternative industries. Mountainous, nearshore Hong Kong Island's historic growth as a site for port services lay both in its exceptional, island-conditioned jurisdictional status and its strategic location, but it also lay in its difficult geography, which occasioned rapid densification, as we shall discuss below. Archipelagos such as Guadeloupe and the Seychelles lack developable land but are located both far offshore from their continental hinterlands and are poorly positioned to play key roles in today's global shipping networks. Their high coast/area ratios are nevertheless beneficial for coastal tourism development. All this is to say that the degree to which high coast/area ratios push island societies toward the marine economy is not necessarily completely explained by straightforward opportunities for harbour development but is instead a result of a complex interplay of terrestrial and marine characteristics.

In this section, we have seen some of the reasons why small islands—both nearshore and oceanic—may be pushed toward reliance on the marine economy. It is worth noting, though, that similar factors may affect development and economic potential on large islands and peninsulas. Chinese examples of major port development in peninsular geographies include Dalian, Kowloon, Qingdao, and Weihai. Peninsulas, however, lack many of the territorial benefits possessed by islands that are discussed below.

Next, we will consider why islands are especially likely to gain a competitive advantage in the marine economy relative to mainland areas.

PROCESSES OF ISLAND URBANIZATION AND DENSIFICATION

Throughout history, though in different places at different times, small islands rose to prominence due to a number of interconnected benefits to island spatiality (including benefits involving territoriality, defence, and transport), which made them ideal sites for nurturing and projecting political and economic power (Grydehøj, 2015).

Historically, it is this combination of spatial benefits that has made small nearshore islands important nodes for trade and centres of government, particularly at the intersections of rivers and the sea. European island cities such as Cádiz, Lübeck, Rotterdam, and Venice developed as easily defended, territorialized, and accessed ports from Ancient times through the Medieval and Early Modern periods. This type of island port city was later replicated in European colonies in the Americas (e.g., Rio de Janeiro, Belize City, and São Vicente) and in the Persian, Arab, and European colonies of East Africa (e.g., Lamu, Ilha de Moçambique, Zanzibar, and Mombasa), serving as trading posts that connected products from mainland industries with capital from the metropole.

In Asia, European powers established a succession of small island trading posts with similar purposes. The Portuguese created trading posts on various Chinese small islands (Shangchuan and Lampacau) before entrenching in Macau (1557). The British colonies on the strategically located islands of Penang (1786) and Singapore (1819) preceded the annexation of Hong Kong Island (1841), and even Germany's trading posts in China were located on islands at the mouth of Jiaozhou Bay (Qingdao and Huangdao) (1891). Such European enclaves were, however, preceded by the rise of genuinely Chinese island port cities: just as colonialists seeking trade with powerful overseas actors often opted for the territoriality, defensibility, and accessibility of island enclaves, local authorities often preferred to restrict foreign traders to small islands in an effort to contain their political influence. This not only made islands and archipelagos such as Guangzhou and Xiamen ideal places for hosting foreign trade visits and foreign businesspeople; it also meant that foreign trading operations were sometimes allocated even smaller islands on which to live, such as Shamian in Guangzhou and Gulangyu off Xiamen.

The above examples are all nearshore islands, but strategically positioned oceanic islands or islands far offshore from the continent have also played important roles as centres of regional economic, political, and military power, with historical examples including Gotland, Malta, Jeju, and Tonga.

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Benefits associated with island spatiality help explain why some important trading centres and centres of government were historically established on small islands, yet it is the aforementioned characteristic of land scarcity that helps explain why small islands have remained significant economic players and have often developed dense urban landscapes that support the marine economy and related industries and functions. Although land scarcity clearly inhibits certain kinds of development, the restrictions that it places on small islands often seem to be offset by the benefits that residents, governments, and businesses gain from the tight clustering of residential, administrative, industrial, transport, and service functions—all with good water access.

One result of land scarcity is the development of agglomeration economies. Agglomeration economies are typically balanced by dispersion forces, with “excess concentration” producing “negative externalities due to congestion, such as longer commuting costs and scarce land for housing and offices” (Tabuchi, 1998, pp. 333-334). Dispersion forces encourage the movement of residents and industries out into the hinterlands, leading to the development of urban sprawl, commuter cities, and/or new urban centres. Yet islands—by their very nature—lack immediate hinterlands. Once an island’s developable land has been developed, the processes of dispersion meet the border of the sea. Although islands may possess connective infrastructures such as bridges, tunnels, and ferry terminals, and although island industrial zones can and are extended to other nearby islands and mainland areas, the lack of territorial contiguity renders such development less attractive than it otherwise might have been.

It is worth emphasizing that even as mechanized land transport and travel by air have revolutionized the movement of goods and people, water remains the preferred medium for moving large loads long distances (Urry, 2014). As marine technologies have become more sophisticated and specialized, industrial harbours have increasingly moved outside city centres and into dedicated port zones, which are often constructed on islands or branching peninsulas of ‘reclaimed’ or manufactured ground. This removes some of the ‘natural’ spatial advantage that small islands once held. Nevertheless, port towns and cities (which are located disproportionately on islands) may retain their economic importance even after the advantages linked to comprehensive water access have disappeared or become less significant. As Fujita and Mori suggest, “Given that cities develop due to their self-reinforcing agglomeration economies, their very presence generates the lock-in effect in the location space, from which individual agents find it difficult to escape, and to which new agents tend to be attracted” (Fujita & Mori, 1996, pp. 94-96). That is, economic benefits encourage agglomeration, and agglomeration produces further economic benefits. These processes are enhanced on small islands, where land scarcity-induced densification tightens clustering and where dispersion forces are weakened due to a lack of hinterlands.

TERRITORIAL BENEFITS TO ISLAND SPATIALITY

We have already touched upon the transport benefits of small island spatiality, but equally important—if more abstract—are benefits relating to territoriality. Territoriality in this case refers to the ability to conceive of a space as a cohesive place: being surrounded by water provides apparently natural borders that help distinguish the island from other places, providing it with an exceptional degree of “geographic legibility” (Grydehøj, 2018). This assists in nation-building processes (Grydehøj et al., 2018), but it also assists in efforts to brand islands as especially sustainable, innovative, dynamic, or pure (Baldacchino & Kelman, 2014; Grydehøj & Kelman, 2016, 2017; Krieg, 2018). The island becomes a synecdoche for the processes that occur within it. When it comes to the production of a strong “place image” (Selby & Morgan, 1996), the ability to present an area as a single, cohesive space is of great benefit. Legal formalization of territorial difference is typically preceded by local and outsider perceptions of difference, and the power of formalized difference is enhanced by perceived difference. These are aspects of what Baldacchino (2010) refers to as the “resourcefulness of jurisdiction.”

Some islands—such as Jeju, Hainan, Sri Lanka, New Zealand, and even Greenland—may be so large in size, with such strong internal geographical diversity, as to be little different from a mainland when it comes to factors that are frequently associated with small island spatiality, such as transport (Karampela et al., 2014; Larjosto, 2018; Leung et al., 2017), governance (Corbett, 2015; Kwong & Wong, 2017; Veenendaal, 2018), and social capital (Baldacchino, 2005; Neilson & São Marcos, 2016; Perumal, 2018). All else being equal, however, territorial benefits are characteristic of islands both small and large. Thus, for example, Hainan as a whole is exceptionally capable of laying claim to localized industrial specializations—ranging from seaside tourism to port services to science and technology to aquaculture to policy expertise—and making them part of a series of island-wide place images relevant to the marine economy. In the game of entrepreneurial governance, islands possess a distinct advantage, assuming that island policymakers are capable of effectively mobilizing the resources necessary to make their territories competitive to begin with.

We can also see these processes at work in Zhoushan, which in recent times has emerged as the site of two of the world’s busiest ports. This is due in large part to Zhoushan’s combination of archipelago spatiality and proximity to major industrial and commercial centres on the mainland, which have encouraged marine economy industrialization. This has also been due to the effect of island spatiality on the establishment of territorial distinctions: Zhoushan’s status as a National New Area (Qiu et al., 2017) is—like the Special Economic Zone status of Hainan and Xiamen, the Pingtan Comprehensive Pilot Zone, and the continued Special Administrative Zone status of Hong Kong and Macau—easier both to create and to maintain as a result of its islandness. In order to remain exceptional, special zones must be clearly bounded and



bordered. Such boundaries and borders are exceptionally visible and conceptualizable in island contexts (Grydehøj, 2018). Special economic zones, special administrative regions, and similar designations are examples of territorial exceptionalism that has been formalized in law, yet the perception of these places as territorially distinct typically preceded their being legally recognized as special. There are exceptions to this rule, of course, but such exceptions are themselves sometimes jurisdictional reactions to territorially distinct island spaces, as in the case of the special status of Shenzhen and Zhuhai, which is implicitly crafted as an economic interface of the adjacent islanded Special Administrative Regions.

We saw above how a combination of high coast/area ratio and land scarcity could serve as a spatial driver toward the marine economy as well as how the densification occasioned by these small island spatial characteristics can further enhance the importance of the marine island economy and increase its competitiveness. In this section, we have seen how territorial benefits can contribute to these other spatial attributes or, in the cases of large islands, represent a benefit on their own. These drivers and advantages may differ somewhat for nearshore islands and oceanic islands, yet both categories of island have played and have the continued capability of playing important roles in global and regional shipping networks, food supply, tourism, and other parts of the economy. (It is problematic for our analysis that nearshore islands remain undertheorized and under-researched in the island studies literature [Hong, 2018].) Nevertheless, successful advanced marine economies depend on more than just straightforward spatial characteristics. As suggested above, they also require a number of less tangible resources. For certain kinds of island and archipelago territories, focus

on the marine economy may be the most obvious and/or the best choice, but that is no guarantee that all of these territories will engage in the marine economy in a manner that is both internationally competitive and beneficial to the island society itself.

CONDITIONS FOR THE MARINE ISLAND ECONOMY

Islands possess a tendency to engage and succeed in the marine economy because of their exceptional land-sea interface, frequent land scarcity, and territorial benefits. Container-based shipping, offshore mineral extraction, industrial fisheries, global tourism, aquaculture, and a raft of other technology-enabled economic activities have increasingly come to rely on islands as hubs that facilitate terrestrial-marine interchange and as nodes in wider marine networks. The conditions for industries cannot, however, be reduced to the mere availability of land or coastline or the mere territoriality of a place. The increasing globalization of the marine economy raises the competitive bar and demands increasingly more of host communities in terms of onshore infrastructure; labour; expertise; and healthy and stable ecological, social, and political environments. As such, while islands may develop marine economies due to a lack of better options or due to interventions by individual business actors, sustained success requires appropriate and informed governance.

Advances in shipping technology have placed new infrastructural demands on ports and associated industries, sometimes necessitating the construction of entirely new harbours (accessed by new roads) and the adoption of new equipment both in and beyond the port itself. The plummeting costs of long-distance air travel and the rise of global tourism have for their part increased expectations for coastal tourism, with island destinations competing with one another at regional and global scales (Almeida-Santana & Moreno-Gil, 2018) for the best, cheapest, most convenient, most spectacular, and most unique island experiences. At the same time, the increasingly globalized and mechanized nature of the marine economy has heightened the need for skilled and educated labour. For islands with relatively low populations, this presents a problem, given that the locally available set and range of skills and competencies will likely be insufficient to serve an advanced marine economy. Furthermore, many islands have historically been subject to demographic processes involving high levels of emigration, as young people travel

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to the mainland or to larger islands in search of work and education that is not available locally. As a result, even if young people wish to remain in their communities and potentially gain skilled employment in the marine economy, this often involves them first leaving their communities in order to receive training and education—with the attendant uncertainty as to whether they will wish to or be able to return home in the future (Cooke & Petersen, forthcoming 2019).

Many island territories have sought to address this by investing in infrastructure and services (culture, entertainment, higher education, sport, transport) that can make remaining on the island more attractive to young people. Yet such is the globalized nature of today's marine economy and the highly specialized skills it requires that it is simply impossible for a single small territory to provide training and education in the full range of necessary services. A successful advanced marine economy thus requires the importation of off-island skills, which frequently spurs programmes to make island life more attractive to skilled labour from the mainland and/or from overseas. Unfortunately, as a result, population retention strategies risk perpetuating a situation in which talented young people who are encouraged to remain on the island end up with fewer or inferior qualifications to those of imported labour, thereby creating a problematic divide in skills and opportunities between locals and incomers. This emphasizes the importance of efforts not just to retain island residents but also to encourage islanders who have acquired skills off-island to return home and potentially to encourage cyclical emigration-immigration of islanders for training and education.

These processes are not unique to the marine economy of course. Small islands, in particular, struggle with skills gaps in many areas. Furthermore, although some skilled jobs in the marine economy require truly specialized knowledge (e.g., marine engineering, shipping logistics, maritime law), many others require high levels of training in more or less transferrable skills (e.g., accounting, hotel management, operations management), with the result that the marine island economy is competing for skilled labour with other segments of the island economy. However, it is also the case that the infrastructure and services that form a part of the marine island economy can be complementary with more straightforwardly terrestrial activities. Marine transport infrastructures can serve not just as hubs in the global maritime network but can also service local industries. Certain kinds of coastal tourism can, for example, boost the surrounding tertiary sector, increasing the demand for and economic value of lifestyle services (e.g., dining and entertainment, beaches, museums) that can also be enjoyed by island residents; encouraging specific kinds of environmentally sensitive land use; or increase the demand for local primary- and secondary-sector products (e.g., fish, fruit and vegetables, art and handicrafts). Indeed, innovative tertiary-sector activities in the marine economy can throw a lifeline to more traditional marine livelihoods, as may occur, for example, when homestay or community-based tourism increases the appeal of small-scale fishing, hunting, and/or agriculture (e.g., Su et al., 2017). Meanwhile, the rollout

of the “smart” infrastructures that are necessary for global business also holds the potential to benefit local business operations and to increase local quality of life.

VICTIMS OF THEIR OWN SUCCESS

None of the above benefits can be taken for granted. In fact, there are a number of ways in which the marine island economy can become a victim of its own success.

Unequal distribution of benefits from the marine island economy

One major risk is that policies that seek to promote the marine island economy may overlook the impact on other segments of society and parts of the economy. Special economic zones of various kinds may involve mechanisms that weaken the local tax base, increase pollution, and worsen working conditions, while profits from the industries within the zone may be overwhelmingly exported out of the territory (Easterling, 2014). Of course, part of the appeal to placing special economic zones on subnational island jurisdictions, in particular, is that this allows the state to accrue economic benefits from the territorial containment of lucrative economic processes that the state nevertheless does not desire to implement across the country as a whole. For example, export processing zones and tax-free zones may support kinds and scales of industry that would otherwise be difficult to attract and maintain, yet few policymakers in large countries wish to see such legal regimes become the general condition.

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The South Korean island of Jeju offers an example of the dangers of special territorial status. Over the past decade, the autonomous province of Jeju has experienced strong economic growth, supported not only by its island advantages in terms of coastal tourism and favourable location but also by its special legal regime, which permits visa-free travel for citizens of many states and encourages foreign direct investment through the Jeju Special Investment Zone system. The booming tourism, construction, and service industries in Jeju have undoubtedly created jobs and new opportunities for islanders, but they have also led to rising property and commodity prices that have a crowding-out effect on other industries, including Jeju’s traditionally strong agricultural industry and its culturally significant fishing industry.

Jeju is a relatively large island, but such crowding-out effects have the potential to be even more acute on smaller islands. In a study on the relationship between tourism and offshore finance on Jersey (one of the Channel Islands of the United Kingdom),

Fishing is a culturally important industry in Jeju



Hampton and Christensen (2007) cast doubt on claims to synergies and complementarities between related island industries. Although “both industries have common characteristics including high mobility, rising global demand, and labor-intensive customer-services operations [and] both require advanced transport and telecommunications infrastructure” (Hampton & Christensen, 2007, p. 999), “beyond a certain stage of development the link between tourism and offshore finance becomes one of intense competition for scarce resources.” That is, one can only take island agglomeration economies so far: both offshore finance and tourism can benefit from island spatiality, but when confronted by limits to growth, it is the more profitable industry that typically wins out. In the case of offshore finance centres such as Jersey and the Isle of Man, the tourism industry—which produces less direct profit for the state but may nevertheless be more capable of providing livelihoods for islanders—ends up dwindling.

Even in cases in which an area does not fall under a special regulatory regime, certain kinds of industrial promotion and success can prove harmful to island society more generally. All too often, new transport infrastructure, coastal tourism, and IT upgrades are enclavized and separated from the surrounding economy, sometimes even physically ‘islanded’. Improved transport and infrastructure may be provided only to special industrial areas or high-income residential districts. Transport infrastructure may be laid out in such a way as to reduce pre-existing mobility between low and high income

The difficult landscape of Nuuk, Greenland's capital city



areas or between tourist and non-tourist areas. Coastal tourism may be limited to resort zones that reduce islanders' access to the coast as well as contain tourist spending within the resort. Similarly, yacht harbours, central business districts, and other results of 'urban renewal' that are targeted largely at tourists or skilled immigrants may displace or remove access to the livelihoods of existing residents (e.g., Grydehøj & Ou, 2017).

From a governance standpoint, much of the problem here involves a tension between state revenues (local, municipal, provincial, or national) that can be used to support welfare and development on the one hand and more subtle issues of societal economic well-being on the other. For example, we can take the case of Greenland, an autonomous island territory with vast natural resources but limited human resources and very difficult internal and external transport challenges. In Greenland, there has been long-running political debate regarding competing aims for fishing, the island's major export industry: should the state seek to boost export competitiveness by pursuing economies of scale and encouraging concentration within the industry, or should it seek to boost employment opportunities in economically marginal regions by further dispersing fishing quotas? Greenland's decades-old struggle with a public administration and business elite dominated by non-locals can be viewed in a similar light: should the state seek to discourage certain kinds of labour immigration in order to enhance employment opportunities for islanders, even if it comes at a short- and medium-term

cost in terms of managerial effectiveness? Furthermore, should population and services continue to be concentrated in Greenland's capital (the town of Nuuk), thereby improving efficiency and laying the groundwork for future high-value marine industries (such as port services, coastal tourism, and marine logistics), or should emphasis be

IN GREENLAND, there has been long-running political debate regarding competing aims for fishing, the island's major export industry: should the state seek to boost export competitiveness by pursuing economies of scale and encouraging concentration within the industry, or should it seek to boost employment opportunities in economically marginal regions by further dispersing fishing quotas?

placed on maintaining livelihoods on the island's economic periphery, which significantly depends upon subsistence hunting of marine mammals? These precise tensions are in some senses highly specific to the Greenlandic context, yet they reflect wider dilemmas in island policymaking and in managing the marine island economy.

Destruction of spatial advantages

Another issue that may arise in cases of successful engagement in the marine economy is that the spatial advantages that islands and archipelagos possess in terms of the marine economy are not always open to unlimited exploitation. These advantages may represent a kind of spatial resource that is at risk of destruction.

For example, although many island territories gain great benefit from their extensive territorial seas and EEZs, the advantages that these provide as fishery resources or sources of subsea fuel and mineral reserves may have adverse effects on local economic actors. The sale of fishing quotas or oil exploration and extraction rights could accrue significant income for the state (either local or national) while bringing disaster down upon inshore fisheries, coastal tourism, and so on. That is, although the sea itself may always be present, its value for the island territory can decrease in the face of over-exploitation or poor management of marine resources.

As discussed above, some islands' success in the marine economy is conditioned by their comprehensive land-sea interfaces and/or high coast/area ratios. These foster density-facilitated agglomeration economies linked to marine industries. However, such processes also frequently lead over time to a weakening of the role of marine industries on particular islands. This may in part be due to a "natural" industrial shift, as certain relatively low-profit marine industries lose out to more lucrative industries in competition for scarce island land, as we can see, for example, in the widespread redevelopment of inner-city marine industrial zones and harbour areas into residential and leisure zones (Giovinazzi & Moretti, 2010; Hein, 2016). That is, marine industries that benefit from island spatiality boost the local economy, leading to densification and agglomeration that raises residents' disposable incomes, with the result that the



Houses with red roofs and quayside near a moored ship, in the main harbour location of Copenhagen

original marine industrial impetus for this economic success is no longer appealing in terms of employment and investment. This can produce a number of paradoxical situations for island cities. Thus, for instance, the island city of Copenhagen is undergoing a construction boom that simultaneously involves the conversion of former marine industrial zones into high-income commercial and residential districts (in the Sydhavn, Christianshavn, Papirøen, Holmen, and Refshaleøen areas) and the expansion and redevelopment of the peninsula of Nordhavn into a modern container port, cruise ship and ferry terminal, and base for marine industries. In this case, the explanation for why some marine industry zones are being destroyed while new ones are created in the same city involves the continued development of marine technologies.

One thing that all these current or former marine industrial zones in Copenhagen have in common is that they are located on reclaimed (artificial) ground. Since the 1500s, Copenhagen has undergone waves of land reclamation aimed at providing ideal spaces for ports, warehouses, naval shipyards, fortifications, and other marine infrastructures. This has, however, significantly narrowed the width of Copenhagen Harbour. Combined with the construction of cross-harbour bridges due to the city's expansion to the adjacent island of Amager, this means that Copenhagen's traditional harbours are no longer capable of serving modern container ships and passenger ships, thereby pushing the city's port out of the harbour and into the open, deeper water. An even more dramatic

example of this process can be seen in Hong Kong, an island city that benefited from the spatial advantages of a deep and long harbour—right up to the point at which continual land reclamation on both Hong Kong Island and Kowloon Peninsula narrowed the harbour, increased the need for cross-harbour transit, and raised the value of non-port services-related industries to such a degree as to make it expeditious to shift port activity development to the island of Tsing Yi, beyond the harbour proper. One island’s loss of certain marine industries is often another island’s gain. Similar push factors help explain Zhoushan’s recent transition from a fishing-based economy into being a pre-eminent site for ports, having come to provide the lion’s share of heavy port services for Ningbo and Shanghai, both of which were famous port cities of earlier eras.

LAND RECLAMATION is a decisive factor in the densification patterns specific to island port cities. As in Hong Kong, the early success of marine industries encourages agglomeration, which raises the value of coastal land. The scaling up of industrial activity places new technical demands on industrial zones and prioritizes new varieties of marine industries, hence the impetus to engage in land reclamation to create tailor-made land-sea interfaces.

Technological change is also a factor here, as the increasing volume and sophistication of cargo management systems, infrastructures, and logistics have encouraged new kinds of land use and spatial organization. Increasing cargo ship size has enhanced the value of deep-water ports, while increasing automation and specialization have enhanced the appeal of highly variegated port facilities, with vast container depots, dry bulk and liquid bulk terminals, and massive unloading and onshore transport systems. These further advocate for the movement of sea ports out of crowded city centres and toward the urban periphery—freeing up valuable space in the centre while boosting land values elsewhere.

Land reclamation is a decisive factor in the densification patterns specific to island port cities. As in Hong Kong, the early success of marine industries encourages agglomeration, which raises the value of coastal land. The scaling up of industrial activity places new technical

demands on industrial zones and prioritizes new varieties of marine industries, hence the impetus to engage in land reclamation to create tailor-made land-sea interfaces. Even today, however, land reclamation is a slow and arduous process, leading to piecemeal expansions of an island’s terrestrial zone and fostering continual processes of densification behind the newly constructed coastlines. Such processes are not limited to major island cities. Land reclamation is also important for coastal tourism in many island territories, providing ground for new hotels, new attractions, and new retail zones. As Johnson (2018) notes, islands of various sizes are sites of “intense geographical transformation” across both vertical and horizontal dimensions.

Land reclamation along a coast may be positive for advanced marine industries such as modern tourism and port services, but could also jeopardize water access to

individuals and businesses who engage in less lucrative marine industries. The small-scale fishing operations that have been placed at risk, made difficult, or rendered impossible by coastal development on islands of many kinds around the world (Al Ansari, 2009; Barton & Román, 2016; Ou & Ma, 2017; Swaminathan, 2014) may not be major sources of state revenue but may nevertheless be important for local livelihoods—which does ultimately impact on the economic well-being of an island territory as a whole. Lack of public access to the water can also result in a declining quality of life for island residents, leading to long-term reductions in an island territory's ability to retain young people and attract skilled labour.

Land reclamation and related engineering efforts involving the hardening or expansion of coastal zones can furthermore have strongly negative effects on the environment. The conversion of island wetlands, mudflats, and mangrove forests into marine industrial zones furthermore represents a reduction in local ecosystem services, which may not be possible to offset elsewhere and which may have serious effects outside their own boundaries, given the importance of these marine environments as storm buffers and as spawning grounds for high-value species (Asaeda, 2016; Zhao et al., 2004).

CONCLUSION

We have shown here that island territories frequently have good reason to opt for a focus on the marine economy. We have also noted some economic and spatial processes that concentrate profits and benefits in the hands of particular industries, non-residents, or local elites, thereby decreasing social and economic cohesion and thus social capital. More concretely, some of these processes directly render difficult or impossible particular marine industries and livelihoods.

The trouble lies in assessing whether that which an island territory gains from particular aspects of international competitiveness within the marine economy is worthwhile relative to the costs that are incurred. In some cases, economic activities that increase inequality and cause localized harm may be warranted if they result in sufficient benefits for the island territory as a whole. Yet it is far from straightforward to determine the appropriate balance of interests between state, individual, and business actors. Local businesses and individuals may have entirely legitimate reasons for opposing particular policies related to the marine economy, without this necessarily meaning that the policies are a bad idea for the island government to undertake (Grydehøj, 2011). It may be, for example, that the needs of a particular fishing community or group of leisure users do not outweigh benefits acquired by the population as a whole.

Those pursuing island development should take care to balance short-term and

long-term objectives while leveraging the very real competitive advantages that arise from island spatialities. This requires a strong governance system that is capable of creating a framework for promoting industry to the benefit of the island society as a whole and for maintaining the island values that support the marine economy.

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