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Maritime security and the Blue Economy: intersections and interdependencies in the Indian Ocean

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Maritime security and the Blue Economy: intersections and interdependencies in the Indian Ocean

Abstract

Maritime security is essential to supporting the Blue Economy. Many maritime security forums have been key supporters of the Blue Economy concept, particularly in the Indian Ocean region (IOR). This paper will explore the co-evolution and co-dependence of Blue Economy and maritime security agendas, with a particular focus on the IOR. It identifies two primary interactions between Blue Economy and maritime security interests. Firstly, maritime security is an enabler of the Blue Economy, for example, through safeguarding navigation routes, providing important oceanographic data to marine industries and protecting rights over valuable marine resources and activities within claimed zones of maritime jurisdiction. Secondly, an often overlooked role that maritime security plays in the Blue Economy is by being itself a source of economic development and growth. An expanded Blue Economy will create greater demand for maritime security capabilities, and this, in turn, will trigger increased investment and growth in these capabilities. The enhanced and increasingly diverse role that maritime security will continue to play in the Blue Economy can be seen across all sectors in the IOR.

Keywords

blue, intersections, indian, interdependencies, security, maritime, economy:, ocean

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Maritime Security and the Blue Economy: intersections and interdependencies in the Indian Ocean

Maritime security is essential to supporting the Blue Economy in a range of significant ways. Many maritime security forums have been key supporters of the Blue Economy concept, particularly in the Indian Ocean region where security partnerships among a range of maritime nations have taken an active interest in articulating their role in addressing threats to ocean-based economic development. This paper will explore the co-evolution and co-dependence of Blue Economy and maritime security agendas, with a particular focus on the Indian Ocean region. It identifies two primary interactions between Blue Economy and maritime security interests. Firstly maritime security is an enabler of the Blue Economy, for example through safeguarding navigation routes, providing important oceanographic data to marine industries and protecting rights over valuable marine resources and activities within claimed zones of maritime jurisdiction. A second, but often overlooked, role that maritime security operations and agencies play in the Blue Economy is by being itself a source of economic development and growth. An expanded Blue Economy will create greater demand for maritime security capabilities, and this in turn will trigger increased investment and growth in these capabilities. The enhanced and increasingly diverse role that maritime security will continue to play in the Blue Economy can be seen across all sectors in the Indian Ocean Region.

Key words: Blue Economy, Blue Growth, maritime security, Indian Ocean

1. Introduction

The term ‘Blue Economy’ has increasingly become an integral component of ocean governance vernacular over the past decade, since its emergence at the 2012 United Nations Convention on Sustainable Development (UNCSD), or Rio +20 Conference. The concept was promoted at the Rio+20 Conference as the marine dimension of the broader ‘green economy’, which was defined as an economy “*that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*” (UNEP, 2011 p16). The Blue Economy emerged to reflect the fact that over 70% of the earth’s surface is water. The oceans are crucial to global sustainability and play a key equilibrating role in global climate as the primary sink for excess heat and carbon present in the global climate system (UNEP et al., 2012). Indeed, the oceans are recognised as a vital repository and supporter of global biological diversity, and are a critical source of food through fisheries and aquaculture and are fundamental to the global economy through sea-borne trade (Warner and Schofield, 2012 p.1).

The concept of a Blue Economy has been particularly championed by Small Island and Developing States (SIDS) in recognition of their large ocean jurisdictions and the importance of ocean and marine industries to their national economies (Silver, Gray, Campbell, Fairbanks, & Gruby, 2015; Whisnant and Reyes, 2015). Since that time there has been increasing interest in the concept of the Blue Economy around the world, yet the term is still employed differently in different contexts and there is no one universally accepted definition of what the Blue Economy is (Keen, Schwarz, & Wini-Simeon, 2017; Silver, et al., 2015).

There is strong interest in sustaining and expanding the Blue Economy in the Indian Ocean, driven in particular by the Indian Ocean Rim Association (IORA) and individual countries including Seychelles, Mauritius, India and Australia (Llewellyn, English, & Barnwell, 2016;

Mohanty, Dash, Gupta, & Gaur, 2015; National Marine Science Committee, 2015; National Maritime Foundation, 2017; Purvis, 2015 p.226; Spamer, 2015). IORA makes a clear distinction between the concept of the Blue Economy and more traditional ocean and coastal economy models. They define the *ocean economy* as a segment of an economy, which is dependent on ocean for the inputs required for production. The ocean economy does not necessarily need to be located on the coast or on or in the oceans. The *coastal economy*, by way of contrast, includes all economic activities taking place on or near the coast and is thus defined in geographical terms. Finally IORA define the *blue economy* as a sub-set of the ocean economy, which ‘*covers all ocean related activities including direct and indirect supporting activities required for functioning of these economic sectors, while adjusting to the costs of environmental damage and ecological imbalance caused due to exploitation of ocean resources for consumption. Therefore, the scope of blue economy is much wider and inclusive*’ (Mohanty, et al., 2015 p9).

Other definitions of the Blue Economy or Blue Growth have been established by the World Oceans Council, the Australian Government, the United Nations, the World Wildlife Fund, the Partnership for the Environmental Management of the Seas of East Asia (PEMSEA), the European Union and *The Economist* magazine, amongst others (East Asian Seas Congress, 2012; Mohanty, et al., 2015; National Marine Science Committee, 2015; *The Economist*, 2015; United Nations, 2014; Whisnant and Reyes, 2015; WWF Baltic Ecoregion Programme, 2015). There are many commonalities across these definitions, with most incorporating economic, social and environmental objectives, and most highlighting a central role for innovation and integrated management in fulfilling these objectives (Keen, et al., 2017). Despite these commonalities, it is clear that the concept of the Blue Economy is fluid, and opaque (Choi, 2017; Silver, et al., 2015; Winder and Le Heron, 2017).

One of the enduring and critical questions often incorporated into discussions of the Blue Economy relates to its sectoral scope. Given the Blue Economy is often thought of as a subset of the ocean economy, identification and valuation of the segments or sectors that make up the ocean economy is often the first step in the process of planning Blue Economy development or identifying potential Blue Economy opportunities (Colgan, 2016). A diverse array of ‘taxonomies’ of the ocean economy, such as the one outlined in Table 1, have been developed to assist this analysis (Kildow and McIlgorm, 2010; Alistair McIlgorm, 2005; The Economist, 2015).

[Insert Table 1]

Questions remain as to what differentiates the ocean and Blue Economies in relation to sectoral scope, however it is clear that potential exists within all sectors to improve environmental performance and grow social and economic benefits. In this regard at least, all sectors have the ability to become more ‘Blue’ (Voyer, Quirk, McIlgorm, Azmi, & Kaye, 2017).

Maritime security, in common with the Blue Economy, is a term which is widely used yet poorly defined. In an analysis of the term, Bueger (2015) identified four key ways in which the term ‘maritime security’ is understood. These included:

- Sea power: the traditional role of maritime security agencies, particularly naval forces, in the protection of states, including patrolling and protecting sea lanes, claimed maritime zones and delimited maritime boundaries and coastal state rights within these maritime spaces.
- Marine safety: addressing threats to ships and maritime installations and assets, including responding to maritime disasters and accidents at sea and participating in search and rescue activities.

- Economic development: enforcing laws and regulations in relation to resource use in the oceans, including countering piracy and smuggling and providing a secure maritime environment which enables and supports economic development.
- Human security: in relation to ensuring food security and sustainable livelihoods, with a particular focus on Illegal, Unreported and Unregulated (IUU) fishing and human trafficking (Bueger, 2015).

This paper will discuss the role that maritime security will play in the transition to a Blue Economy, with a particular focus on the Indian Ocean Region (IOR). It will begin by exploring the co-evolution of these two ambiguous concepts; ‘maritime security’ and the ‘Blue Economy’. It will then review the ways in which maritime security is contributing to Blue Economy activities in the Indian Ocean, using the four categories of the ocean economy outlined in Table 1 to frame the discussion: i) Extraction of non-living resources, ii) Harvesting of living resources, iii) Commerce and trade in and around the ocean and iv) Ecosystem protection and management, with particular reference to the four categories of maritime security highlighted by (Bueger, 2015). Finally, it will summarise and discuss the intersections between maritime security and the Blue Economy.

2. The co-evolution of ‘maritime security’ and the ‘Blue Economy’

The modern day concepts of maritime security and the Blue Economy both have their roots in two significant historical influences on oceans governance. The first was the substantial expansion of maritime claims seawards that was codified through the negotiation and drafting of the United Nations Convention on the Law of the Sea (UNCLOS) (UNCLOS, 1982). The second was the broader sustainable development agenda, derived from the 1987 Brundtland report and the 1992 Rio Earth Summit (Bueger and Edmunds, 2017; Eikeset et al., 2018).

2.1. UNCLOS

The Third United Nations Conference on the Law of the Sea took place between 1973 and 1982, and saw over 140 nations come together to develop an international legal framework governing maritime rights and activities. UNCLOS provides for a 12 nautical mile limit to the territorial sea – something that had eluded earlier efforts at codification. Moreover, the concept of an Exclusive Economic Zone (EEZ), out to 200 nautical miles, gained general international acceptance. Indeed the EEZ concept originates from the Indian Ocean region as the term was first proposed by an Indian Ocean State, Kenya, in a working paper submitted to the African-Asian Legal Consultative Committee in 1972, just prior to the start of the negotiations leading to UNCLOS.

The EEZ represents a compromise between the predominantly resource-oriented interests of coastal states and the interests of states concerned to preserve freedom of navigation. While freedom of navigation and overflight for vessels and aircraft belonging to other states are maintained, together with the rights for such states to lay submarine pipelines and cables, the EEZ delivers sovereign rights in respect of living and non-living resources to the coastal state. The potential significance of this expansion of coastal state resource rights offshore to coastal states was well recognized in the immediate aftermath of the negotiation of UNCLOS with a 1984 UN Food and Agriculture Organization (FAO) report suggesting that 90% of marine fish and shellfish were caught within 200 nautical miles of the coast (Schurman, 1998 p.107). Similarly, it was estimated that 87% of the world's known submarine oil deposits would fall within EEZ limits (Churchill and Lowe, 1999 p.162).

UNCLOS therefore both precipitated, and responded to, an increased level of attention and interest in the economic opportunities that might be provided by oceans and the resources that can be found within them. It was also highly influential in the changing role of security agencies and activities on our oceans. Maritime security has always played a central role in

protecting and developing economic assets and resource use in coastal areas and open oceans. This role has changed and evolved significantly, however, in response to expanded maritime jurisdictions, coupled with a shift in the nature and extent of maritime threats, such as the rise of terrorism and modern piracy (Bueger and Edmunds, 2017).

Significantly for both economic and maritime security interests, UNCLOS has gained widespread international recognition and, at the time of writing, there were 168 parties to it, comprising 167 states plus the European Union. Of the Indian Ocean's 36 coastal states, 32 are parties to the Convention. The exceptions are Eritrea, Iran, Israel and the United Arab Emirates (UAE) (United Nations, 2017). Additionally, the two extra-regional states with Indian Ocean possessions, France and the United Kingdom, are parties to UNCLOS. The Indian Ocean littoral States have proved to be similarly enthusiastic in terms of claims to maritime jurisdictions meaning that broad swaths of the Indian Ocean are subject to EEZ claims and assertions of continental shelf rights. The latter have included full submissions or submissions of preliminary information to the United Nations Commission on the Limits of the Continental Shelf (CLCS) on the part of 18 Indian Ocean states concerning the delineation of the outer limits of the continental shelf seawards of 200 nautical mile EEZ limits (UN CLCS, 2017).

UNCLOS has therefore both clarified and significantly expanded offshore rights. This has provided nations with rights over considerable marine resources and activities. Thus, with this increase in the scope of maritime jurisdiction came the right to access and exploit marine resources as well as to manage offshore industrial activities. Such novel activities provide the promise of new economic income streams through a range of developing marine industries including aquaculture, ocean energy production, marine ecotourism, carbon capture and storage and seabed mining.

2.2. Sustainable Development

Around the same time as UNCLOS was being negotiated, there was a concurrent and growing awareness of the need to better consider the environmental impacts of natural resource use and extraction. The 1987 Brundtland report recognized the importance of development which accounted for the needs of future generations and the 1992 Rio Earth Summit advanced the notion of sustainable development – development which considers these needs through the consideration of social and environmental objectives, alongside economic objectives (Brundtland, 1987). In particular, the Earth Summit advanced the notion of a ‘Green Economy’, later defined as an economy “*that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*” (UNEP, 2011 p16).

The initial focus of sustainable development and Green Economy efforts and activity largely related to terrestrial systems. However, 25 years after the release of the Brundtland Report, SIDS began to challenge this focus and emphasized the importance of the ocean and coastal economy to their countries. The 2012 United Nations Convention on Sustainable Development (UNCSD), or Rio+20 conference, placed a heavy focus on the Green Economy and SIDS used this opportunity to highlight the importance of considering the marine environment within this model of development. They were the first to put forward the concept of a Blue Economy as the ocean based component of the Green Economy (Silver, et al., 2015; Whisnant and Reyes, 2015), and were successful in introducing this concept into increasingly common usage.

2.3. Implications and intersections

The historical development of UNCLOS and maritime security is interconnected in a number of significant ways. The ratification of UNCLOS has resulted in an increased awareness of

the enormous opportunity offered through rights over vastly expanded zones of maritime jurisdiction and the valuable marine resources and activities within them. The sustainable development agenda, coupled with the advocacy work of SIDS in drawing attention to the oceans, has emphasized the need for development to be environmentally sustainable and socially equitable. Both these development have resulted in a greatly enhanced, and more diversified role for maritime security commitments, as coastal states seek to protect and safeguard their natural and economic assets.

The increased interest in the economic opportunities provided by the oceans has heightened the need for maritime spaces to be clearly defined and safeguarded, including through significantly increased maritime surveillance and enforcement requirements. Maritime security has therefore evolved to expand beyond predominately naval defence of states and sovereign interests through military action, to include a range of additional roles and functions related to what is often termed ‘non-traditional’ threats (S. Bateman, 2016). In particular, significantly expanded maritime zones and marine resource-related rights, as well as increasingly diverse offshore activities, have created the need for substantially enhanced maritime surveillance and enforcement requirements. Maritime security is now a term which incorporates a diversity of actors - military and civilian, across both the public and private sectors – addressing multiple threats. Furthermore, even within the traditional defence forces, maritime security has evolved to extend beyond the military domain to incorporate additional constabulary and diplomatic roles (S. Bateman and Bergin, 2009; Upadhyaya, 2014). In addition, with many threats and benefits crossing multiple maritime jurisdictions, security arrangements have necessarily become increasingly cooperative and have led to the development of a range of regionalised alliances (S. Bateman, 2016; Bueger and Edmunds, 2017).

Maritime security is increasingly playing a role in guarding against environmental damage and policy environmental regulations, such as Marine Protected Areas (MPAs) and fisheries regulations, highlighting the complex intersections with all aspects of the Blue Economy. The nature and extent of these intersections are examined in greater detail in the following sections, with a particular focus on the IOR.

3. The role of maritime security in the Indian Ocean Blue Economy

The Indian Ocean is a vast maritime zone covering 68.56 million square kilometres and incorporating coastal states from the southern tip of South Africa to the west coast of Australia (Upadhyaya, 2014). Thirty-six countries have access to the Indian Ocean, with vast differences in the cultural, social and economic conditions of many of these states. As the world's third largest ocean, and with approximately one-third of the world's population living in the Region, the Indian Ocean has significant potential to contribute to global efforts to combat poverty, enhance food security and provide for new economic opportunities (Upadhyaya, 2014). The Blue Economy is a concept which seeks to promote innovative and environmentally responsible development of these opportunities. The following sections will explore the role that maritime security plays, and has the potential to play, in these efforts in the region, based around four overarching categories of the ocean economy.

3.1. Extraction of non-living resources, or resource generation

This category of the ocean economy relates to largely static, and geographically discrete operations such as oil and gas extraction, future deep seabed mining operations, water desalination, and maritime renewable energy such as tidal, wind or wave energy generation. The fixed nature of mineral resources, and the infrastructure associated with renewables, means that questions of jurisdiction are extremely relevant to this aspect of the ocean economy. As they generally occur within the EEZ or territorial waters of a state, their

management is primarily a coastal state concern. In part, this has been a significant driver in efforts from countries around the world to delimit their maritime boundaries, in order to clarify the extent of their maritime jurisdictions and thereby ensure that they have rights over any resources (living and non-living) that occur within their waters. For resources in the high seas, which are of particular interest for potential deep seabed mining and biotechnology, there has also been significant progress in defining the rights and responsibilities states that might wish to exploit these as part of broader negotiations around Areas Beyond National Jurisdiction (ABNJ) (see section 3.4.1).

The management, expansion and growth of the Blue Economy in relation to the extraction of non-living resources, or resource generation are therefore heavily predicated on the clear articulation and resolution of jurisdictional questions. As noted above, UNCLOS provides for extended zones of maritime jurisdiction through continental shelf rights and the EEZ, and Indian Ocean coastal states have been enthusiastic claimants to these zones. Due to the proximity of other neighbours, many coastal states, Indian Ocean littoral states included, are often unable to claim the full extent of their maritime zones as set out under UNCLOS. The extension of coastal state claims has therefore led to significant areas of overlapping maritime claims and thus a proliferation in potential maritime boundaries. Where overlapping claims to territorial seas out to 12 nautical miles exist, Article 15 of UNCLOS applies whilst Articles 83 and 73 deal with delimitation of the continental shelf and EEZ respectively.

Unfortunately, these articles provide only limited guidance regarding maritime delimitation, meaning that there is ample scope for conflicting maritime claims and maritime boundary disputes.

Here it can be observed that there is a marked contrast between the east and west of the Indian Ocean with regard to maritime boundary delimitation. While in the east over 20

maritime boundary agreements have been concluded and the maritime boundary mosaic is largely complete with the notable exception of the boundaries associated with Timor-Leste (see below), in the west by contrast only seven maritime boundaries have been delimited since 1976 (Prescott and Schofield, 2005 p.461-462).

In part this disparity can be attributed to differing coastal geography. Although each sector contains a single large island – Sri Lanka in the east and Madagascar in the west, the eastern and western halves of the Indian Ocean are geographically distinct. The eastern Indian Ocean is characterised by major archipelagos, most notably that of Indonesia, but also the Andaman and Nicobar Islands group. These island groups are predominantly located towards the Indian Ocean's mainland margins and there are relatively few isolated islands, although Australia's Cocos (Keeling) Islands and Christmas Island are notable exceptions to this general rule. In contrast, the western part of the Indian Ocean features predominantly smooth continental coastlines, coupled with numerous small isolated islands and groups of islands such as the Comoro Islands group and islands scattered through the Mozambique Channel, the Seychelles, the Maldives, the Chagos Archipelago, Reunion and Mauritius (Prescott and Schofield, 2005 p. 461).

Geopolitical factors also play an important role. Significant civil unrest in, for example, Somalia and Yemen, has tended to relegate maritime boundary delimitation to the back burner in a number of cases in the western portion of the Indian Ocean (Prescott and Schofield, 2005 p.462). Excessive claims to baselines along the coast from which maritime zones are measured are also a source of dispute (Roach and Smith, 2012). Similarly, the Indian Ocean features multiple sovereignty disputes over islands which, in turn, impede maritime boundary delimitation with respect to the maritime spaces associated with them. These island disputes include:

- *Scattered islands in the Mozambique Channel*: France retains control over a number of tiny island territories located in the Mozambique Channel, namely Bassas da India, Europa Island, the Glorioso Islands and Juan de Nova Island, all of which are also claimed by Madagascar.
- *Mayotte Island*, whose population voted in favour of remaining under French jurisdiction when the Comoro Islands achieved independence, is nonetheless claimed by the Comoro Islands.
- *Tromelin Island*, a small, uninhabited islet located approximately 280 nautical miles east of Madagascar and around 340 nautical miles north of Mauritius and Reunion is likewise under French administration but is claimed by Mauritius.
- *Diego Garcia and the Chagos Archipelago*: Located in the central, northern Indian Ocean these islands are retained by the United Kingdom as the remnant of the British Indian Ocean Territory but are also claimed by Mauritius.

While considerable progress has been made towards the delimitation of maritime boundaries in the Indian Ocean, many potential maritime boundaries remain undelimited. This is problematic from both Blue Economy and maritime security perspectives. Where overlapping maritime claims exist, the resultant uncertainty over jurisdiction tends to complicate ocean resource access and management. The sustainable management of marine living resources can be severely hampered where maritime boundaries remain unsettled and potentially broad areas of disputed waters exist. At the least, uncoordinated policies damage management of shared stocks while at the more severe end of the spectrum, potentially destructive and unsustainable competition for access to the resources in question can result. With respect to non-living resources, overlapping claims generally tend to prevent access to any mineral resources such as hydrocarbons as international oil and gas companies tend to be extremely

risk averse in the absence of fiscal and legal certainty and continuity (Schofield, 2011). For example, Australia and Timor-Leste's longstanding dispute concerning maritime delimitation and joint arrangements in the Timor Sea has prevented development of the Greater Sunrise complex of predominantly gas fields worth an estimated \$6 billion (Schofield, 2007). Happily there are indications that this dispute is progressing towards resolution (PCA, 2017).

The IOR is therefore a clear demonstration of the reliance of successful Blue Economy development of safe, secure and peaceful resolution of maritime boundaries, and the potential for a role for traditional sea power functions in cases where this resolution is not forthcoming. Maritime claims, limits and boundaries define areas over the ocean where coastal states have rights and such rights need to be protected. This is particularly true for critical infrastructure and high cost fixed assets associated with the extraction of non-living resources, such as oil and gas platforms and renewable energy installations, which have potential to be at risk from terrorist activities (Mehdiyev, 2012). This places a significant burden on coastal states with broad maritime zones in terms of providing for adequate surveillance of their waters and enforcement where necessary. This burden has been offset to some extent by increasingly sophisticated technologies associated with monitoring and surveillance, or Maritime Domain Awareness, which has attracted significant investment in new technologies in the region (see section 3.3.3).

3.2. Harvesting of living resources

This category of the ocean economy relates to a variety of methods of living resource extraction from the oceans, including fisheries, aquaculture and marine bio-technology. One of the distinct challenges of this sector is managing transboundary, common property resources especially fisheries, which require a co-ordinated and multi-lateral approach.

Maritime security has played a particularly significant constabulary and diplomatic role in addressing threats to the effective management of these resources.

Marine capture fisheries in the Indian Ocean represent around 16 per cent of global catches, with substantial growth in the eastern half of the Indian Ocean over the last decade. Three of the top 10 marine capture fisheries countries are in the Indian Ocean Rim (FAO, 2016 p.8). Fisheries account for a large portion of economic activity in many large and small Indian Ocean coastal states. In the Maldives, for example, fisheries account for 90% of exports and in Seychelles, fisheries account for over half of foreign exchange earnings (Michel, 2014 p.111). Fisheries also play a vital role in livelihoods and food security. For example, inhabitants of Bangladesh, Comoros, Indonesia, Maldives, and Sri Lanka get more than half of the animal protein in their diets from fish (FAO, 2014). Ensuring the fisheries resources of the region are sustainably managed is therefore critical to the long term social and economic health of the region. Illegal, Unregulated and Unreported (IUU) fishing is considered a major threat to the ability to manage fisheries resources sustainably and to realize the potential of a Blue Economy. Despite this, monitoring, control and surveillance systems in the region are known to be weak, with fisheries governance fragmented across multiple organizations and agreements and, as noted above, the incomplete delimitation of maritime boundaries in the region (FAO, 2016 p.10-16; Michel, 2014 p.116).

The transboundary nature of IUU fishing means that maritime safety and security is recognized as a priority area for regional cooperation. In 2015, IORA members signed the IORA Maritime Cooperation Declaration, which committed members to “*address maritime challenges such as Illegal Unreported and Unregulated fishing*” (para 5) including by “*[e]nhancing coordination and communication between and among national maritime*

agencies and authorities and other relevant fora...[and]...enhanc[ing] cooperation on maritime safety, marine environmental protection and maritime security.” (IORA, 2015)

The development of a regional approach to managing IUU fishing remains in its early stages in the IOR but will undoubtedly require significant attention as countries look to grow and expand their Blue Economies. For example, since the settlement of maritime boundaries within the Bay of Bengal in 2014 (PCA, 2014; Schofield, Telesetsky, & Lee, 2013), countries such as Bangladesh have recognized the significant potential that exist within its largely unexploited offshore fisheries (Hussain, Failler, Karim, & Alam, 2017). Successfully exploiting this resource will require investment in appropriate vessels and fishing technologies to fish in remote and deep water locations as well as a cooperative surveillance and security activities between neighbouring countries to guard against IUU (Hussain, et al., 2017).

It is also well recognised that addressing IUU fishing requires addressing the systemic drivers of IUU fishing. In this regard maritime security actors play an active diplomatic role in supporting improvements in governance arrangements and the implementation of aid programs which seek to contribute to poverty alleviation and improvements in community wellbeing (DFAT, 2015).

The exploitation of living resources therefore involves engagement with all aspects of maritime security. Competition for living marine resources in disputed waters (as outlined in Section 3.1) clearly has maritime security dimensions as, for example, confrontation between rival fishing fleets has the potential to draw in the maritime enforcement forces of the coastal states concerned with the potential for incidents to escalate towards conflict. This traditional sea power function is complemented by a focus on economic development and human security aspects of maritime security, which involves enforcing relevant laws and regulations

and addressing IUU from a both a diplomatic and constabulary perspective. Finally, marine safety functions are also significant for this component of the Blue Economy particularly in regard to search and rescue, which will be increasingly critical as maritime nations expand their interests into more remote offshore fisheries, as seen by the Bangladesh example.

3.3. Commerce and trade in and around the ocean

This category of the ocean economy relates to shipping and transportation, ports, coastal development and marine and coastal tourism and is the category in which maritime crime poses the most significant threat to a stable, and sustainable, Blue Economy. Many of these threats cross national jurisdictions and therefore require a coordinated maritime security approach. Maritime transport is recognised as the backbone of the global economy accounting for over 80% of world trade, amounting to in excess of 10 billion tonnes of goods shipped in 2015 (UNCTAD, 2016). The Indian Ocean hosts some of the busiest shipping lanes in the world, with 25-30% of global shipping movements occurring in the region (Llewellyn, et al., 2016). Approximately 100,000 ships transit the region annually, carrying up to a third of the world's bulk cargo, half of the containers and two-thirds of the oil (Upadhyaya, 2014). This creates great opportunities and carries with it many potential threats. There is also significant capacity for growth in tourism in the region, especially from the burgeoning cruise ship sector. Cruise tourism is currently estimated to be worth 35.5 billion U.S. dollars, yet the bulk of this occurs in the Mediterranean and Caribbean with only a small fraction occurring in the IOR (Statista, 2016). This is largely due to the volatile nature of security in the region. Growing this sector will require enhanced, and coordinated maritime security capabilities alongside careful management and maintenance of ecosystem health and the visual amenity of natural areas (Llewellyn, et al., 2016).

3.3.1. Background

There has been significant activity with the IOR designed to enhance and grow the potential contribution of commerce and trade to the region's economy. While many countries in the region have ambitions to expand their interests in shipping and ports, the most ambitious plans for this development come from outside the region. The proposal by the Chinese Government for a One Belt One Road initiative (OBOR) has the potential to play a significant role in the future of the Blue Economy in this region. Announced in 2013 by President Xi Jinping during visits to Central Asia and Southeast Asia, OBOR aims to expand economic integration along corridors toward Central Asia, Europe, Southeast Asia, Africa and the Middle East (Blanchard and Flint, 2017 p.226). While information around this proposal is limited, its central platform is the development of six economic corridors based around two main transport routes: an overland link from China through Central Asia to the Europe (the 'belt'); and a "21st Century Maritime Silk Road" through Southeast Asia and the Indian Ocean to the Middle East, Africa and Europe (the 'road') (ESCAP, 2017). The vision for the OBOR is framed around five pillars that reflect many of the same key principles espoused within the Blue Economy: green development, ocean-based prosperity, maritime security, innovative growth and collaborative governance.

The Maritime Silk Road is aimed at promoting the expansion of coastal economies and maritime 'clusters' akin to special economic zones (Walsh, 2017) and developing infrastructure to support trade and trade routes across the Indian Ocean. In particular the OBOR is relevant to Blue Economy developments in ports and shipping in the Indian Ocean, given its central position in the Maritime Silk Road and its overland links to sections of the inland 'belt' (D. Brewster, 2017; ESCAP, 2017). This has led to a growing interest, and investment, from China in the development of ports in the Indian Ocean (see Khurana, 2016).

The OBOR and the Maritime Silk Road are clear examples of the interaction, and sometimes uneasy relationship, that exists between the Blue Economy and maritime security. While they have clear economic drivers, the OBOR and the Maritime Silk Road may also have a significant influence on the security environment and geopolitical balance in the Indian Ocean. China sees OBOR as promoting economic cooperation between participating countries and boosting global trade more generally. This contrasts with the views of the US (and others such as India), who see it as a potential “geopolitical threat” (Blanchard and Flint, 2017; Khurana, 2016). For example, Khurana (2016) argues that China will likely use economic (and humanitarian) drivers for a naval presence in the region (i.e. “military operations other than war”) as a way of legitimizing a strategic foothold.

In February 2016 China commenced construction of its first foreign military base – a naval base in Djibouti. This is a further reflection of both China’s ambitions to spread its reach beyond its immediate neighbourhood and its strong interest in protecting its maritime trade interests in the Indian Ocean (Krupakar, 2017). Increasing economic interests arguably create the need to protect them, and it this is likely to lead to an increased role for maritime security in the region (Blanchard and Flint, 2017; Figliomeni, 2012).

3.3.2. Threats

Some of the most significant threats to the growth of ocean-based economies in the IOR relate to maritime crime including piracy, terrorism and smuggling. Somali piracy is perhaps one of the most striking examples of the potential impacts of these crimes on the development of a Blue Economy in the region. In the mid-2000s piracy off the coast of Somalia began to pose a major threat to cargo vessels, fishing boats and private yachts, building to a peak in 2011 when more than 300 attacks and nearly 30 hijackings were reported (Larsen, 2015). The impacts of these attacks on global trade, food security and

tourism were recognised by countries in the region but were a challenge to address. In part this was due to the transboundary nature of piracy, which required a coordinated approach, across a number of navies, coastguards, domestic judicial systems and the private sector (Bueger and Edmunds, 2017; Larsen, 2015). Piracy falls under ‘universal jurisdiction’ under UNCLOS, meaning that any state can intercept piracy suspects on the high seas. This allowed navies from around the world to apprehend suspected pirates. Amongst the private sector, armed security guards have been employed to protect vessels travelling in the region, raising coastal state security concerns (Schofield, 2014). This option has proved effective, however, as under these arrangements no successful attack has been recorded since 2012. The threat of piracy remains real throughout the region, however, particularly in areas marked by political instability and poverty (Larsen, 2015; Upadhyaya, 2014). Many of the cooperative approaches to managing Somali piracy have therefore remained in place, and in fact have been increasingly formalised in recent years (Bueger and Edmunds, 2017; McCabe, 2018).

The IOR has additionally been considered a focus for potential terrorism activities, due to weak governance arrangements and known connections with Al-Qaeda in countries like Somalia. This has made the region a focus on US led anti-terrorism activities, with a focus on an increased naval presence in the region aimed at increasing surveillance and intelligence gathering. This increased naval presence is likely to have served as an additional deterrent to piracy activities in the region (McCabe, 2018 p169).

In addition to threats associated with criminal behaviours, natural and human induced disasters are a significant risk to the Blue Economy in the IOR. The Indian Ocean has nine recognised ‘choke points’ for shipping movements. These narrow channels carry increased risks from piracy and terrorism but also create significant difficulties in managing traffic and navigation (Llewellyn, et al., 2016; Upadhyaya, 2014). Maritime collisions and accidents can

have profound environmental, social and economic impacts and therefore are a natural enemy of an effective Blue Economy.

3.3.3. Response to threats

It is clear that commerce and trade in and around the ocean have the potential to play a highly significant role in the future IOR Blue Economy, but in order to achieve its full potential, significant maritime security threats will need to be addressed. Not least of the security challenges involve surveillance and monitoring to ensure effective deterrence and timely response to potential threats and disasters. Maritime Domain Awareness (MDA) relates to the comprehensive knowledge of the situation at, or related to the seas, and consists of the combination of ‘situational awareness’ (or what can be observed at sea) and ‘threat awareness’ (or what threats are anticipated or suspected)(Rahman, 2010). It has become an increasingly prominent component of maritime security with the increased threat of terrorism but is also relevant to the management of other forms of maritime crime. For example, in response to the Somali piracy issue an information sharing platform named ‘Mercury’ was developed, which allowed the sharing of data in real time across naval and civilian operations (Bueger and Edmunds, 2017).

The tools of MDA including vessel tracking data (such as automatic identification systems), sensors, satellite and radar data, customs and immigration information, intelligence, databases and environmental information (Bueger and Edmunds, 2017; Rahman, 2010). These multiple sources of data allow for a systematic and comprehensive understanding of a broad array of maritime related activities, including infrastructure and shipping channels, such as cargo and vessel movements (Rahman, 2010). Effective MDA also benefits Blue Economy sectors, as the data is often shared with Governments and the private sector (and vice versa). For example, Australia’s Integrated Marine Observing System (IMOS) gathers regular physical,

biogeochemical and biological data relating to oceanic conditions which is then shared with a range of private and public sector actors to assist in management, research, development and commercial activities (Bergin, 2016).

MDA is recognised to be a necessarily cooperative activity, incorporating data from public and private sectors, across both civilian and military actors and multiple jurisdictions.

Cooperation is also required to manage the response to actualised threats. The Indian maritime security think tank, the National Maritime Foundation, identify the lack of a clear transboundary maritime security framework as a key challenge to providing the necessary protection for economic assets (National Maritime Foundation, 2017). To date the naval forces of the IOR have played a significant role in addressing many of the threats relating to piracy, terrorism and smuggling, with the Indian Navy playing a leading role in developing regional maritime security approaches. Somali piracy also provided for an increased role for countries outside the IOR, including EU and NATO member states (S. Bateman, 2016; Larsen, 2015).

The Indian Ocean Naval Symposium (IONS) was developed to facilitate greater cooperation and interoperability amongst the various navies and coastguards within the IOR and outside the region, and has 35 member countries including all 20 members of IORA (S. Bateman, 2016; Upadhyaya, 2014). It is recognised, however, that the disparate and geographical vastness of the region, and the diversity of its economic interests, poses a challenge to regional maritime security architecture (S. Bateman, 2016; Upadhyaya, 2014). Instead there has been a greater focus on sub-regional organisations such as the Southern African Development Community, which includes a maritime committee, and the African Union, who developed an African Integrated Maritime Strategy (AIMS) in 2012 (S. Bateman, 2016). These sub-regional institutions have been actively engaged in negotiations around the Blue

Economy. For example, the AIMS has a particular focus on safeguarding the maritime domain for wealth creation and includes a proposal which explores a transboundary approach to economic development through a ‘Combined Exclusive Maritime Zone of Africa’ (S. Bateman, 2016).

Commerce and trade in and around the ocean is a particularly significant, and increasingly prominent, sector of the Blue Economy. Its relationship with maritime security is unarguable – sea power and economic development functions relate to protection of shipping channels and safe passage of vessels at sea. Maritime safety and human security functions are required to prevent and respond to natural and human induced disasters at sea.

3.4. Ecosystem protection and management

While perhaps not traditionally considered a significant function of maritime security, there is increasing recognition of the role that maritime security will need to play in safeguarding the environmental health of the natural assets which form the basis on the Blue Economy. One of the most significant contributions of maritime security actors to the environmental protection objectives of a Blue Economy is through their constabulary role in enforcing environmental regulations, including laws which prevent dumping of hazardous materials at sea. In particular navies and coastguards are often involved in ensuring compliance with the regulations of MPAs, which are growing in size and number throughout the IOR. Whilst, from a legal perspective, this environmental protection role is a relatively straightforward undertaking within areas of national jurisdiction, there remain significant ambiguities around how the environment in ABNJ can be effectively safeguarded as Blue Economy interests expand into these areas.

Over the past two decades, the international community has recognised the urgent need to conserve and sustainably use the enormous wealth of marine biodiversity in the vast ocean

ABNJ which make up almost half of the planet. The fragmentary international law framework and governance structure applicable to ABNJ and the rapid depletion of fish stocks on the high seas has provided the impetus for a process in the United Nations to develop an international legally binding instrument on conservation and sustainable use of marine biodiversity beyond national jurisdiction (ILBI). UN General Assembly Resolution 69/292 provides that negotiations to develop the new ILBI (proposed for 2018) should address the four elements of a package deal agreed by States in 2011 (United Nations General Assembly, 2015). These elements comprise marine genetic resources including questions on the sharing of benefits, measures such as area based management tools, including MPAs, environmental impact assessments and capacity building and the transfer of marine technology (United Nations General Assembly, 2016 para. 3). The process initiated by the UN General Assembly (UNGA) Resolution 69/292 to develop the elements of the ILBI has the potential to contribute to a more integrated and cross sectoral system of oceans governance at a global and regional scale (United Nations General Assembly, 2016). Once in force, it also has the potential to enhance environmental and resource security across substantial areas of ABNJ including the Indian Ocean and will include much clearer articulation of the role that maritime security actors will play in ABNJ.

The contribution of maritime security to the ecosystem protection and management aspects of the Blue Economy extend beyond enforcement of environmental regulations. They are also engaged in research and monitoring activities which increase scientific understanding and knowledge in relation to the marine environment, and are frequently involved in efforts to predict, prevent and respond to environmental disasters. Defence agencies regularly collect and monitor oceanographic, geographic, hydrographic and meteorological data as part of their efforts to build both situational and potential threat awareness through MDA (Rahman,

2010). This data also allows them to respond quickly, safely and effectively to natural and human induced maritime disasters.

In the event of an accident or collision coastguards and navies are often first responders in terms of both human safety – through search and rescue activities – as well as environmental containment and impact management responses. This is also relevant to natural disasters, with defence services playing a major role in the humanitarian response to disasters such as the 2004 Indian Ocean tsunami.

Finally, there is increasing recognition that maritime security agencies must themselves be actively involved in managing the environmental impact of their activities. The Australian Navy, for example, has developed policies to manage environmental risks and limit impacts from their activities, including from waste, introduced marine pests and sonar activities, which have the potential to impact marine mammals (Department of Defence, 2016b).

Moreover, technological innovations pioneered by Australian Navy, such as the renewable energy-based micro-grid being developed to power its base on Garden Island, Western Australia, HMAS Stirling, have been highlighted as potential options for small island developing states in the Indian ocean such as Mauritius (Opray, 2017)

4. Discussion

Maritime security forums in the Indian Ocean region have been key supporters of the Blue Economy concept. This support has taken a number of forms, including the development of security partnerships across a range of maritime nations focused on addressing threats to economic development from piracy and IUU fishing (David Brewster, 2014; Bueger, 2015; National Maritime Foundation, 2017). Table 2 summarises some of the key findings of this analysis in relation to the ways in which the Blue Economy and maritime security intersect. It

points to two clear functions that maritime security plays in the development and growth of a Blue Economy in the Indian Ocean region.

- Maritime security as an enabler of the Blue Economy, and
- Maritime security as a sector within the Blue Economy.

[INSERT TABLE 2]

4.1. Maritime Security as an enabler of the Blue Economy

Maritime security is considered essential to supporting the Blue Economy in a range of significant ways, relevant to multiple sectors within the Blue Economy. As outlined in Table 2, all four elements of Maritime Security, as identified by Bueger (2015), were identified as occurring with the Blue Economy and Maritime security nexus.

The traditional ‘sea power’ role of naval forces has been both enhanced and diversified through the increased emphasis on delimitation of maritime jurisdiction, and increased activity within and across claimed maritime zones. This is perhaps most dramatically demonstrated through the increased military presence of Chinese naval forces in the IOR as it expands its economic interests in the region through the Maritime Silk Road project.

Maintaining peace and security through peace keeping operations, international diplomacy and aid programs play important roles in supporting the stability necessary for fostering and growing economic relationships, and protecting crucial trade routes, and navies will continue to be important in their traditional military role within the region.

Navies, particularly the Indian and Australian navies, have also diversified their activities into non-traditional roles. Maritime security operations are often central to disaster response, search and rescue operations and maritime incidents, such as oil spills or accidents at sea. In this regard they play an important role in protecting human life and property, as well as

environmental health (DFAT, 2015; National Marine Science Committee, 2015). The importance of marine safety activities is especially pronounced in the IOR, given the region's particular vulnerabilities to human and natural disasters. These vulnerabilities include a number of shipping 'choke' points, and coastal communities at risk from the increased likelihood of natural disasters associated with climate change, including low lying SIDS. MDA plays a key role in detecting maritime threats and developing strategies to avoid, mitigate or respond effectively to these threats and, in turn, protect the economic and natural assets which underpin the Blue Economy. The data gathered by maritime security agencies through these activities also provides critical information needs relevant to the Blue Economy, including weather and oceanic conditions, bathometric and oceanographic data and vessel tracking. This data, much of which is shared with industry and across jurisdictions, provides reliable and accurate information to assist maritime industries to plan and manage their business activities and provides insights into potential new opportunities for ocean based economic development.

At its core maritime security is designed to provide a stable and secure environment in which economic development can occur and grow. Maritime security agencies contribute to the Blue Economy through their defence of important maritime assets and infrastructure against threats such as maritime terrorism. The link between economic development and maritime security is therefore fundamental to the Blue Economy. This has been demonstrated in the IOR through the role of maritime security in managing piracy, which has been seen to pose a significant threat to economic activities in the region in recent history. This role will evolve in the high seas as it responds to the future outcomes of the ABNJ process, as well as the resolution of maritime boundary disputes. It will also necessitate an increasingly cooperative approach as countries in the region seek to ensure the enforcement of laws and regulations relating to resource use across jurisdictions, particularly in relation to fisheries management.

Many of the maritime security measures designed to address economic development also have implications for human security, given they are considered important tools in ensuring ongoing food security and the development of new economic activities for some of the most impoverished countries in the world.

4.2. Maritime Security as a sector within the Blue Economy

The other important, but often overlooked, role that maritime security operations and agencies play in supporting the Blue Economy is by being itself a source of economic development and growth. As the Blue Economy expands and grows in response to concerted efforts within the region, there will be greater demand for maritime security capability. For example, the activities associated with the Maritime Silk Road have been foreshadowed to trigger significant investment in port development and shipping in the region, and will require commensurate investment in security and defence. There will therefore be an increasing role for navies, coastguards and private maritime security agencies in an expanded Blue Economy, which will include policing maritime crime, conducting monitoring and surveillance and participating in search and rescue. This is likely to drive additional investment in shipbuilding and associated infrastructure within the region. For example, the Australian Defence white paper points to significant investments in amphibious vessels, offshore patrol vessels, frigates and submarines and includes a particular emphasis on innovation in these activities (Department of Defence, 2016a).

Another likely outcome of an increased emphasis on maritime security within a growing Blue Economy will be the enhanced need for training and capacity development activities. This will be required to assist local countries to develop effective coastguard and defence capabilities, as well as the necessary skills and expertise to contribute to MDA activities

(Bueger and Edmunds, 2017). Education and training in maritime security is hence likely to be another ‘Blue growth’ industry in the IOR and beyond.

The role of maritime security as a sector within the Blue Economy is difficult to quantify, given the wide array of industries it incorporates and problems with effectively defining the extent of maritime security operations across both the public and private sectors. For this reason it is often absent from attempts to value the current worth of ocean or Blue economies (e.g. see Australian Institute of Marine Science, 2016; Alistair McIlgorm, 2005; Alistair McIlgorm, 2016). The full extent of the contribution of maritime security to global economies therefore remains poorly understood but is likely to be significant, and growing.

4.3. Conclusion

Analysis of the intersection of the Blue Economy and maritime security in the IOR points to the mutually co-dependent nature of both. The UNCLOS has resulted in greater attention on the economic potential of the oceans as coastal states seek to make maximum use of their expanded maritime claims. This has precipitated an increased and more diversified role of maritime security in the world’s oceans. The Blue Economy as a concept has evolved out of this increased interest in the economic potential of the resources contained within national jurisdictions. It recognises the importance of sustainable use and environmental protection as necessary to secure the ongoing availability of the opportunities provided by the oceans. It is also heavily reliant on maritime security to protect these opportunities from a range of threats, and to provide a safe and secure environment which enables the development of these opportunities. With the increased role of maritime security, will come increased investment and growth of support industries, such as shipbuilding, suppliers of technology to assist with MDA and maritime infrastructure, such as ports. This, in itself, will generate new economic and employment opportunities for the IOR.

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Table 1 – Sectors that contribute to the ocean economy (adapted from *The Economist*, 2015)

Extraction of non-living resources, or resource generation	Harvesting of living resources	Commerce and trade in and around the ocean	Ecosystem protection and management
Seabed/ Deep seabed mining	Fisheries	Shipping (marine transportation)	Blue Carbon
Oil and gas	Aquaculture	Shipbuilding and repair	Surveillance and maritime security
Water (desalination)	Marine biotechnology	Marine construction (e.g. jetties etc)	Habitat protection/ restoration
Dredging	Recreational fishing and boating		Hazard protection
Energy/renewables (tidal/wave energy; coastal/offshore wind)	Marine transport equipment manufacturing	Port infrastructure and services	Ecological/ ecosystem research
	Seafood processing	Marine services (e.g. mapping, monitoring, consulting, maritime insurance, etc.)	Waste treatment and disposal
		Marine education and R&D	
		Coastal Development	
		Marine and coastal tourism	
		Defence	

Maritime security and the Blue Economy

Table 2 – Matrix outlining the intersections between maritime security and the Blue Economy

	Extraction of non-living resources, or resource generation	Harvesting of living resources	Commerce and trade in and around the ocean	Ecosystem protection and management
Enabling the Blue Economy	<p>Seapower: Peacekeeping, defence and surveillance activities within expanded maritime zones, including disputed territories.</p> <p>Marine safety and economic development: especially in relation to energy security through the protection of maritime assets and infrastructure, such as oil rigs and renewables</p>	<p>Economic development and human security: managing IUU fishing through cooperative regional arrangements</p> <p>Seapower: Managing conflict in disputed territories.</p> <p>Human security: search and rescue e.g fishing vessels</p>	<p>Seapower: Managing geopolitical threats</p> <p>Economic development: Maritime crime prevention and management through patrol activities, monitoring and surveillance (piracy, terrorism, smuggling, human trafficking).</p> <p>Marine safety and human security: MDA and disaster management</p>	<p>Human security: Surveillance and data provision for disaster management and response</p> <p>Marine safety and economic development: Enforcement of resource use and environmental protection regulations (e.g MPAs). Protecting against environmental crimes (e.g. IUU fishing, illegal dumping at sea)</p>
Contributing to the Blue Economy	Expanded naval fleets with associated shipbuilding and associated industries	<p>Public and private sector engagement in enforcement activities, including patrol boat building.</p> <p>Expanded MDA, innovation in surveillance and monitoring technologies.</p>		