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# Environmental drivers of maritime insecurity: governance, enforcement and resilience in the western Indian Ocean

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## ABSTRACT

Despite evidence of the interconnections between the environment, security, and development in a maritime context, and the acute impact this relationship has on the human security of coastal populations, they remain siloed policy areas and underrepresented in the academic literature. This article zooms in on the western Indian Ocean as an example of a region where environmental dynamics intersect with other stressors, such as poverty, disenfranchisement, and a limited maritime security capability, to drive and prolong criminal disorder and violence. After providing some regional context, I explore how climate change, marine environmental degradation, and resource exploitation are linked to occurrences of maritime insecurity by drawing on fisheries crime and piracy. Next, I critically analyse how regional states have built capacity to improve resilience against environmental factors that contribute to increasing maritime insecurity. I conceptualise this under three headings: environmental governance, enforcement and monitoring, and building resilience. This analysis reveals that despite increasing governance arrangements and a shift in the rhetoric towards regionalism, significant gaps remain in terms of physical, technical and human capacity.

## KEYWORDS

Environmental governance; maritime security; sustainable development; western Indian Ocean; Somalia; capacity building; ocean economy

## Introduction

The relationship between security, the marine environment, and human development has not received sufficient academic or policy attention compared to analogous issues on land.<sup>1</sup> In other contexts, untangling the connections between these traditionally disparate areas of enquiry has gained prominence in recent years.<sup>2</sup> This has largely focussed on insecurity in the context of scarcity of renewable resources,<sup>3</sup> human security and peacebuilding<sup>4</sup> or more recently, climate change and conflict.<sup>5</sup> Maritime security extends beyond the sea. The challenges it presents are closely inter-linked with issues of development and security on land, in terms of both cause and effect.<sup>6</sup> Yet, analyses of the linkages between security and the marine environment remain underdeveloped. It is also only an emergent policy area in the western Indian Ocean region, despite this growing recognition that they should be understood as equivalent issues and not as distinctive policy or operational silos.

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Environmental drivers are more prominent in analysis of maritime insecurity in other regions, such as the Gulf of Guinea, given the preponderance of the oil industry and the impacts this has on the ecology of the marine environment and the livelihood of coastal communities.<sup>7</sup> However, environmental drivers in the western Indian Ocean are less well understood despite the prominence that access to marine resources and grievances over governance of maritime spaces have in relation to incidences of maritime insecurity and criminal disorder. Increasingly though the narrative is shifting. From a 'laundry list' approach that addresses specific maritime security threats or environmental concerns separately, to a more comprehensive approach that recognises the nexus between the environment, security and development.<sup>8</sup> This article contributes to this emergent turn in marine governance by examining how environmental and related developmental issues drive maritime insecurity and exploring regional and international efforts to build capacity to help communities and states become more resilient in the face of these issues. Existential threats, such as the effects of climate change, make this an even more pressing concern.

This article explores the question: what types of environmental issues drive maritime insecurity in the western Indian Ocean region, how do they manifest, and are how states responding through capacity-building measures? To address this, firstly, I explore how regional states conceptualise the nexus between the environment, development and maritime insecurity. Next, I test a key argument in this article that environmental factors are one of the drivers of maritime insecurity in the region by drawing on empirical research on the primary regional manifestations of maritime insecurity, chiefly piracy and fisheries crime. To do this, I identify three areas that are representative of the ways environmental issues drive maritime insecurity. These are climate change, marine environmental degradation, and resource exploitation. Knowing how these linkages manifest is an important step in formulating policy and building capacity to mitigate against criminal disorder in the context of unpredictable environmental impacts.

This is followed by an examination of novel capacity-building approaches that aim to better enable regional states to exploit the economic potential of the ocean on a more sustainable basis, protect marine ecosystems, and build resilience against future threats. I conceptualise this under three headings: environmental governance, enforcement and monitoring, and building resilience. Here, I highlight how, despite a move in the narrative towards a more comprehensive approach that the actual implementation of such measures to protect the environment and secure blue economic activities still suffer from insufficient capacity, particularly in terms of technical and human resources.

While the empirical focus of this article is on the western Indian Ocean region,<sup>9</sup> insights here are applicable for other parts of the world. This includes regions with an abundance of Small Island Developing States, and regions where maritime security, environmental, and developmental issues intersect, such as the Caribbean, Southeast Asia, or the Gulf of Guinea.

## Methodology

There is limited data and case-based evidence for the linkages between maritime security, the ocean environment and sustainable development in an African context when compared with Asia or Oceania.<sup>10</sup> There is, however, an abundance of literature related to

specific topics, such as security threats, environmental issues, or the blue economy, but there is a distinct lack of synthesis or attempts to merge these traditionally disparate areas of enquiry to generate a more holistic understanding in terms of the crossovers between the different issues. This article responds to this gap by drawing on diverse literature from these research areas and the latest empirical insights into how environmental and developmental issues drive maritime insecurity in the western Indian Ocean. Specifically, I draw upon the maritime security, blue economic, ocean governance, and marine science literature in relation to environmental and developmental drivers alongside the nascent literature on maritime capacity building and resilience to understand the successes and limitations of resilience-building measures.

I employ a mixed methods approach including quantitative sources such as statistical data and figures extracted from government and non-governmental reports alongside qualitative sources including policy papers, regional strategies, historical documents, and publications representing the current state of academic and scientific examination in the field. This article provides a critical baseline to build more nuanced research and data into these linkages to help strengthen marine policy in the western Indian Ocean and elsewhere in other complex maritime contexts.

The western Indian Ocean has been selected for investigation in this context, as it is paradigmatic of the ways in which environmental grievances and developmental issues drive maritime insecurity with resultant impact on local communities, littoral states, and the global supply chain. Somalia plays a central role here as the genesis of much of this disorder due to the persistent political, economic and environmental issues faced by the country. Environmental drivers in the context of this article relate to both anthropogenic (e.g. destruction of marine ecosystems due to overfishing or pollution) and natural phenomena (e.g. sea level rise or extreme weather events such as flooding or drought). For example, Illegal, Unreported and Unregulated (IUU) fishing by distant water vessels, extreme weather events linked to climate change, and the discharging of hazardous waste, have exacerbated conflict and insecurity in Somalia, a country already struggling with political, environmental and socio-economic instability.<sup>11</sup>

To understand what types of maritime insecurities environmental factors drive, I primarily draw on occurrences of fisheries crime and piracy as representative of the major regional manifestations. This is based on the UN Office on Drugs and Crime (UNODC) led 'Caught Red-Handed Workshop' in 2018 where representatives from ten western Indian Ocean nations identified fisheries crime as the most significant maritime security threat next to trafficking, marine pollution and piracy.<sup>12</sup>

### ***Beyond seablindness?***

Historically, most coastal African states projected security policy and defence budgets inland with a lower priority given to maritime challenges, despite fisheries, for example, being a mainstay of coastal community economies.<sup>13</sup> Despite this, in recent years there has been a notable turn towards the sea. The genesis of this relates to a growing recognition that developing the blue growth agenda – defined as the long-term strategy to support sustainable growth in the marine and maritime sectors as a whole – had to operate in parallel with building domestic maritime security capacity, engaging with the development needs of coastal communities, and managing environmental and criminal

disorder at sea.<sup>14</sup> Kenya, for example, created a Monitoring, Control and Surveillance entity under the Fisheries Management and Development Act of 2016 as well as a new Coast Guard Service in 2018, whose role includes fisheries protection.<sup>15</sup>

Despite differences in the level of priority afforded to these issues at a state level, multilateral Pan-African institutions are increasingly recognising the need to consider the intersections between maritime security, development, and the environment in a more holistic way. The African Union's 2050 Integrated Maritime Strategy, for example, highlights that ocean development is stifled by insecurity, '[the] intensity of activities at sea is taking place against the backdrop of insecurity, various forms of illegal trafficking, degradation of the marine environment, falling biodiversity and aggravated effects of climate change'.<sup>16</sup> Regional intergovernmental organisations are also responding to the security-development nexus. The Intergovernmental Authority on Development, for example, through its Security Sector Programme is working to enhance the capacity of member states to operationalise international protocols for countering IUU fishing and chemical dumping. They are also establishing security-based fish industry activities to promote 'stakeholder mentality' among littoral communities.<sup>17</sup>

Multiple regional conflicts have also taken on a maritime dimension with environmental grievances driving insecurity in places like Cabo Delgado, the Maldives, and Yemen. As al-Mowafak emphasises, while 'environmental issues may not have caused the emergence of today's conflict in Yemen on their own, they have served as an aggravating factor for pre-existing social grievances'.<sup>18</sup> This is also notable in Somalia where environmental challenges alongside chronic structural deficiencies have fuelled poverty, conflict and insecurity for decades. These issues take place against a global backdrop of increased human activity at sea as the capacity to industrialise the ocean grows and, as a result, marine ecosystems face 'unprecedented cumulative pressures from human activities and climate change'.<sup>19</sup>

### ***Environmental drivers of maritime insecurity in the western Indian Ocean***

Maritime criminality, much like manifestations of criminality ashore, is typically fuelled by economic disadvantage, socio-political marginalisation, environmental grievances, or change.<sup>20</sup> Coastal populations in the western Indian Ocean are particularly vulnerable to poverty and disenfranchisement if traditional sources of income, such as fishing, are negatively impacted. This can be man-made (e.g. overfishing) or as a result of natural phenomena (e.g. extreme weather events) and can be linked to upsurges of criminality, which can lead to new conflicts or exacerbate existing ones.<sup>21</sup>

In this section, I explore the ways in which climate change, marine environmental degradation, and resource exploitation are linked to occurrences of maritime insecurity in the region. The combined impact of these three non-traditional security domains are described by Cordner as 'the greatest future threat to the collective interests of Indian Ocean countries and peoples'.<sup>22</sup> To illuminate how the linkages manifest, I draw on examples of the major manifestations of maritime criminality chiefly fisheries crime and piracy.

Most coastal states in the western Indian Ocean are dominated by small-scale commercial and artisanal fishing operations, which are particularly vulnerable to fluctuations in fish ecology or extreme weather events for example, and elements of these

communities are therefore at risk of turning to criminality as an ‘economic buffer against poverty’.<sup>23</sup> James Njiru of the Kenya Marine Fisheries Research Institute commented that the main issues affecting the resilience of coastal fisheries communities in the region are climate change, IUU fishing, and the destruction of habitats.<sup>24</sup> Levin et al. highlight how tensions in this context can transcend borders, as ‘conflicts between citizens of neighbouring countries in East Africa are often associated with conflicts between national and migratory fishermen over limited marine resources’.<sup>25</sup> Piracy is one example of how socio-political and economic factors combine with environmental drivers resulting in criminality and disorder. This reflects what Mazaris and Germond refer to as a ‘synergistic process, which results in an exponential loop of environmental issues, structural pressures on the social, political and economic systems, and maritime crimes’.<sup>26</sup>

Environmental or developmental factors are rarely the sole cause of insecurity or criminal disorder. The drivers of maritime insecurity in the western Indian Ocean fit in a matrix of threats that are often interlinked at multiple levels.<sup>27</sup> This includes state collapse and lawlessness, extreme poverty and limited employment opportunities combined with favourable geography, opportunism, corruption, and a deficient maritime enforcement capability.<sup>28</sup> Environmental factors are important however, as they can increase the severity and duration of criminal activity and complicate the resolution of conflict. According to a report by the United Nations (UN) Interagency Framework Team for Preventive Action, ‘increasing scarcity of renewable resources, or grievances over their governance and/or transboundary nature, can drive, reinforce or compound existing stress factors and play a contributing role in the decision to resort to violence’.<sup>29</sup> Grievances in this context predominantly relate to the perceptions of socio-economic and/or political injustice.<sup>30</sup>

## Climate change

The impacts of climate change have the potential to act as both a threat multiplier and stress aggravator rather than an isolated driver of insecurity or conflict in the western Indian Ocean. This corresponds with arguments against assigning direct causal pathways between environmental and developmental issues and insecurity by prominent academics.<sup>31</sup> A recent report by the European External Action Service supports this contention and suggests that ‘climate change and environmental degradation could exacerbate existing tensions in conflict settings, ultimately leading to increased violence and generating additional humanitarian needs’.<sup>32</sup> This has been framed as a ‘climate-resilience-peace nexus’<sup>33</sup> or as a ‘climate-security nexus’.<sup>34</sup>

As previously highlighted, building a resilient blue economy is vital for coastal countries in the region, and many such as Djibouti, Kenya, Seychelles, and in 2023 Somalia, have published Blue Growth strategies. Critically, blue economic development is recognised as a way of building resilience and reducing the vulnerability of communities to climate change by improving food and livelihood security.<sup>35</sup> However, if sufficient capacity is not put in place and if livelihoods are further adversely affected, elements of disenfranchised coastal communities may turn to criminality to supplement a loss of income. The upsurge of Somali piracy was at least partly the result of aggrieved and disenfranchised former fishers levying foreign fishing vessels operating in Somali

waters.<sup>36</sup> This quickly developed into an organised criminal enterprise responsible for widespread insecurity and economic turmoil in the region, negatively affecting the economies of Somalia and its neighbouring states. While, the effects of climate change do not imply a return of piracy directly, they can exacerbate the grievances that gave rise to the phenomena in the first place.

Changing weather patterns combined with sea-level rise, also threaten to degrade key infrastructure along coastlines, such as ports, and threaten fragile marine ecosystems, such as coral reefs and sea grass meadows. As Germond and WaHa highlight [the] ‘impacts of climate change on natural systems, such as a loss, or change in, marine biodiversity, can then reverberate on human, social and political systems. This can in turn increase the incentive to engage in maritime criminal activities’.<sup>37</sup>

One study projected that increasing seawater temperatures, growing ocean acidification and regional oxygen depletion in the Indian Ocean will likely lead to decreasing primary production.<sup>38</sup> Ocean acidification in particular has a cascading effect on the ecology of the western Indian Ocean and subsequently on the vital marine socio-economy.<sup>39</sup> This relates particularly to tuna catch, a major source of revenue, employment and food security for fishing and coastal communities in the region.<sup>40</sup> According to a report by the Institute for Sustainable Development and International Relations, ‘simulation with a coupled economic-biologic model indicate that the western Indian Ocean may show the most important climate driven decrease in tuna global catch’.<sup>41</sup>

Apart from damage to the ecology and biodiversity of the marine environment, and the corresponding impacts on local economies, other aspects of climate change can also impact maritime insecurity and conflict. Sea-level rise, for example, may result in the recalculation of some maritime boundaries due to shifting baselines, which not only raises legal questions about transit, economic zones, and jurisdiction but also has the potential to escalate existing maritime territorial disputes linked to access to offshore resources.<sup>42</sup> There is also the potential for more serious future insecurity relating to competing maritime territorial claims in this context.<sup>43</sup> This is reflected in the 2021 International Court of Justice ruling on the maritime delineation between Somalia and Kenya, which Kenya has rejected ‘in totality’.<sup>44</sup> The ongoing conflict in Yemen, is also exacerbated by environmental factors linked to climate change such as changing weather patterns and worsening soil, water, and air quality but also factors linked to human activities including widespread environmental pollution and the over-exploitation of natural resources.<sup>45</sup>

While the maritime case presents unique characteristics, such as its liminal and transnational nature, it mirrors to a large extent resource conflict and insecurity driven by climate change ashore in the Horn of Africa. For example, climate change threatens to increase insecurity and conflict in rural centres in Kenya because of capacity challenges associated with low technical ability to manage climate governance, poor integration of diverse opinions and marginalisation of indigenous knowledge into adaptation and mitigation agendas.<sup>46</sup>

## Environmental degradation

It is estimated over 20,000 ships transit through the Red Sea and the Gulf of Aden via the Suez Canal and in to the western Indian Ocean every year.<sup>47</sup> This leaves the



marine environment increasingly vulnerable to ocean dumping, waste disposal, and oil spills with small island states in particular, like Seychelles, Mauritius, and Maldives, expressing concern over the ‘multi-faceted’ threat from accidental deposits of hazardous waste at sea due to poor safety procedures, alongside more overt dumping activities.<sup>48</sup> The MV Wakashio incident in August 2020 exemplified the threat when approximately 1,000 tonnes of oil leaked from a grounded tanker causing an ‘ecological emergency’ off the coast of Mauritius.<sup>49</sup>

In addition, billions of litres of sewage and industrial waste enter the region’s coastal waters every year resulting in depleted oxygen levels, which directly threatens fish stocks alongside so-called ‘dead zones’ where there is not enough oxygen to sustain marine life.<sup>50</sup> This exists alongside other destructive anthropogenic practices that damage the marine biological systems on which ‘ecological sustainability relies’.<sup>51</sup> These include the use of dynamite, coral trampling, destructive fishing gear, coral extraction, snorkelling, terrestrial development resulting in sedimentation and run-off, and freshwater impoundments.<sup>52</sup>

The dumping of hazardous waste has been a problem in Somali waters for decades owing chiefly to a deficient maritime enforcement capability and weak governance structures ashore. In 1985, a regional Action Plan for the Conservation of the Marine Environment and Coastal Areas in the Red Sea and Gulf of Aden was developed, which was revised in 1995 and again in 2005. The agreement highlighted and calculated the scale of pollutants affecting human health and marine ecosystems in the region from municipal, industrial and oil pollutants, and more generally, reflected the scale of the problem.<sup>53</sup>

The case of Somali-based piracy can be viewed as a ‘precarious effect’ of environmental degradation that reached a critical level and triggered destabilisation and violent conflict.<sup>54</sup> This links to arguments that marginalised communities internationally have historically borne a disproportionate share of environmental harm, from exposure to pollutants, toxic waste, and other environmental hazards.<sup>55</sup> The UN Monitoring Group on Somalia reported in 2008 that the dumping of toxic waste in Somali territorial waters alongside illicit overfishing by foreign vessels had adversely affected the ‘ecology and economy’ of the country.<sup>56</sup> Crucially, the perception of these acts was just as significant as the environmental impact. As the UN Security Council highlighted, ‘Genuine economic hardship, whether directly related to these factors or not, and a sense of grievance against foreign exploitation of Somalia’s maritime resources, not only inspire many pirates, but also serve to legitimise their activities in the eyes of their communities’.<sup>57</sup> According to a report by The German Advisory Council on Global Change, ‘Such destabilisation can affect the domestic constitutional structure of individual states as well as interstate relations. Weak and fragile states can thus have an indirect “spillover” effect on the wider region and on the international community as a whole’.<sup>58</sup>

## Resource exploitation

The occurrence of fisheries crime is perhaps the most revealing example of how maritime security intersects with ocean development and marine environmental challenges in the western Indian Ocean region. Small-scale fisheries make up over 95 per cent of the marine catch and are vital for the livelihoods and food security of coastal communities



throughout the region.<sup>59</sup> In Bangladesh, Comoros, Indonesia, Maldives and Sri Lanka, fish provides more than half the animal protein in adult diets.<sup>60</sup> Whereas in Kenya the fishing industry employs over 60,000 fishers directly and an estimated 1.2 million people within the fishing, production and supply chain.<sup>61</sup>

Despite this, they face continuing threats from overexploitation by distant water fleets primarily due to inequitable licencing schemes and low surveillance capacity, but also from ecological degradation and ocean warming.<sup>62</sup> The depletion of fish stock due to overfishing by foreign vessels as well as minimal local capacity to yield this stock (alongside other economic and governance factors) was one of the drivers of coastal populations towards subsistence criminal activity such as piracy, migrant smuggling, and drug trafficking.<sup>63</sup> This has been framed as the 'empty sea' narrative that posits piracy and other subsistence maritime crimes as rational responses to overfishing, IUU activities, and economic underdevelopment.<sup>64</sup> According to Belhabib et al., the mechanisms for artisanal fishers' participation in drug trafficking, for example, might include 'poverty and structural marginality, resulting from increasing competition from industrialised fishing fleets, and exclusionary marine conservation policies'.<sup>65</sup>

Pomeroy et al. describe this as a 'complex feedback cycle' where a combination of growing populations and shrinking economic opportunities leads to increasing competition both between fishers and among levels of fishing operation.<sup>66</sup> This also drives higher numbers of vulnerable displaced persons, which provides opportunities for people smuggling networks to flourish, with commensurate pressures on police and prosecution authorities to target and deal with offenders.<sup>67</sup> The World Bank estimates an increase of around 86 million more environmental refugees<sup>68</sup> by 2050 in sub-Saharan Africa alone.<sup>69</sup> This provides traffickers with a rich flow of vulnerable people to potentially exploit. Collectively, therefore, this can lead to higher rates of human violence and criminality, both at sea and on land including violence between fishers operating at the same scale, violence among fishers operating at different scales, maritime crime, armed conflict, and civil unrest.<sup>70</sup> The spectrum of ways maritime insecurity is driven by environmental and developmental change is therefore significant and implies the need to build capacity in a more holistic way.

In 2005, a study by the UK Department for International Development found that Somalia lost an estimated US\$100 million to illegal tuna and shrimp fishing between 2003 and 2004 alone.<sup>71</sup> In 2018, for the first time in over two decades, the Federal Government of Somalia granted legal offshore fishing licences, with 31 licences given to Chinese longline vessels to fish tuna and tuna-like resources in the Exclusive Economic Zone.<sup>72</sup> Despite the residual economic benefit, Okafor-Yarwood et al. argue that such arrangements, in particular the government's lack of capacity to monitor activities, have the potential to undermine 'social wellbeing' and the 'conservation of the marine environment', thereby aggravating the environmental grievances that contributed to an escalation of piracy in the first place.<sup>73</sup> Moss and Pigeon support this contention and emphasise that 'empowered communities' will remain a necessity to ocean health and fishery sustainability.<sup>74</sup>

Interviews with Somali pirates, such as those carried out by Stig Jarle Hansen in 2009, suggested that many pirates claimed to be operating in a quasi 'coast guard' capacity protecting Somali waters from IUU fishing or the dumping of waste and levying offenders for such acts.<sup>75</sup> Some groups, such as the self-styled

‘National Volunteer Coast Guard’ that operated from the southern port of Kismayo appeared to concentrate on interdicting fishing vessels between 1998 and 2001.<sup>76</sup> As Bueger suggests, the ‘coast guard narrative’ casts piracy as a normal practice of protection against environmental crime, resource robbery or the violation of borders, and as contributing to the economic development of Somali regions.<sup>77</sup> However, as Okafor-Yarwood et al. suggest, if small scale fisheries in Somalia are not supported and sustainability problems endure offshore, this cycle of IUU fishing resulting in piracy and armed robbery against vessels would likely re-emerge.<sup>78</sup>

### ***Capacity building: governance, enforcement and resilience***

National and regional responses to these complex and interrelated challenges can be diverse and are particularly challenging for small island and coastal states in the western Indian Ocean that have historically struggled with issues of capacity. In addition, maritime issues have traditionally been accorded lower political priority than other areas and existing institutional and human resources may be more limited in the maritime sector than elsewhere.<sup>79</sup> In this context, capacity building emerged as a core method of attempting to increase the resilience of coastal and island states against the effects of marine environmental pressures and related criminal activity. While approaches to mitigating environmental drivers of insecurity on land are better established, such as the UN Interagency Framework Team for Preventive Action 2012, they are less developed in a maritime context.

International responses to maritime insecurity in the western Indian Ocean initially focused on the containment of piracy at sea by deploying naval assets and creating new patrolled security zones. With the decline of pirate attacks against shipping after 2012, the international community, in collaboration with regional states and organisations, have increasingly focused on building the capacities of countries to tackle maritime insecurity more broadly. This shifts focus from more kinetic threats to the environmental and socio-economic drivers of instability through the sustainable development prism and the creation of innovative governance frameworks.<sup>80</sup> The Lomé Charter, for example, promotes the training and capacity building of the maritime, port, and industrial sector for ‘safe and responsible use of the maritime domain’ thereby recognising the interlinkages between the environment and security.<sup>81</sup> By providing littoral states with the capacity to exploit, but also protect, the ocean environment and build resilience against environmental shocks, coastal communities can directly benefit from the blue economy in a more meaningful way, and therefore be less likely to pursue alternative criminal lifestyles.<sup>82</sup>

This section explores the characteristics and challenges associated with national and regional capacity building measures that focus on improving maritime security in the context of marine environmental issues as outlined in the previous section. It argues that without sufficient physical, technical and human capacity, governance mechanisms, enforcement, and resilience measures will likely not be sustainable or implementable. This analysis focuses on three thematic areas: (1) Environmental governance, aimed at protecting the ecology and sustainability of maritime spaces through policy, regulation and planning. (2) Enforcement and monitoring, to counteract environmental related

crimes at sea, such as IUU fishing as well as enforcing regulations in newly designated zones. (3) Building resilience measures to strengthen the blue economy, increase food and income security in the context of environmental stressors, and support sustainable livelihoods to deter coastal populations from criminal activities.

While several national initiatives are evident, there is a shift in thinking towards more holistic and harmonised regional approaches to manage and safeguard the marine environment and tackle maritime insecurity. However, capacity-building efforts in the western Indian Ocean are often designed either externally without input from local end-users or at a national level without input from neighbouring states. This has frequently resulted in duplication of effort and inadequate coordination; ‘short termism and project logics’; as well as a preference for technocratic solutions over well-established local ways of doing things.<sup>83</sup>

As highlighted in a report for the Indian Ocean Commission, the sharing of experience and training techniques and tools would be a useful intervention to optimise the capacity-building that is currently underway or planned, particularly given the political, institutional and cultural similarities across the region.<sup>84</sup> This links to arguments by other academics that suggest regional fisheries governance, for example, should move away from the existing paradigm of standalone Regional Fisheries Management Organizations, to a more integrated arrangement.<sup>85</sup>

However, implementing regional agreements in this context is undermined by the capacity limitations already mentioned and most attempts to develop integrated responses to environmental issues in the western Indian Ocean region have tended to be disjointed when compared to other parts of the world.<sup>86</sup> Despite the interlinked nature of environmental issues and maritime insecurity as highlighted in this article, regional entities, such as the Indian Ocean Commission or the South African Development Community for example, tend to focus on common security threats and economic opportunities rather than the nexus with environmental concerns.<sup>87</sup> Therefore, building governance, enforcement, and resilience capacity in the region needs to find the right balance between national and regional requirements.<sup>88</sup>

## Environmental governance

This section examines selected examples of regional governance initiatives with relevance to both environmental and security issues and explores how they build capacity and where capacity gaps exist. Here I zoom in on the Djibouti Code of Conduct and the Jeddah Amendment of 2017 alongside national approaches through coastal zone management efforts such as Marine Spatial Planning. Despite efforts to tackle regional manifestations of maritime insecurity and improve marine environmental governance, enduring limitations related to technical, institutional and human capacity and resources remain a significant governance challenge.<sup>89</sup>

### *The Djibouti code of conduct and the Jeddah Amendment*

While much has been written about the Djibouti Code of Conduct (DCOC) in the context of counter-piracy operations, less research exists on the Jeddah Amendment (JA) of 2017 and the impact of the framework beyond piracy.<sup>90</sup> The JA recognised the

important role of the blue economy – including shipping, fisheries, and tourism – in supporting sustainable economic growth, food security, employment, and stability, while also addressing issues such as the illegal dumping of toxic waste and illicit trafficking in wildlife.<sup>91</sup> This reflected a crucial lesson that maritime security threats cannot be tackled in isolation and that a more comprehensive approach was needed.

While the JA focuses primarily on regional approaches under the DCOC, article three explicitly addresses measures at a national level. It calls on participants to develop and implement: (a) a national strategy for the development of the maritime sector and a sustainable blue economy that generates revenue, employment and stability; (b) appropriate national maritime security policies to safeguard maritime trade from all forms of unlawful acts; (c) national legislation, practices and procedures, informed by national maritime threat assessments; and (d) national legislation which ensures effective protection of the marine environment and sustainable management of marine living resources.<sup>92</sup> For example, the Technical Cooperation Programme of the International Maritime Organization (IMO), under the DCOC, along with the UN Assistance Mission in Somalia, the EU Capacity-Building Mission in Somalia, and the UN Office on Drugs and Crime, have provided technical assistance to the new Somali Maritime Administration on maritime safety, security, and protection of the marine environment.<sup>93</sup> In addition, Information Sharing Centres were established in Dar es Salaam (Tanzania), Mombasa (Kenya) and Sana'a (Yemen) in 2011. However, the centres mainly operate in principle and have not achieved much visibility or produced tangible outcomes.<sup>94</sup>

The primary mechanism for capacity building under the DCOC framework and JA is the regional training centre that opened in Djibouti in 2015. Despite covering a broad range of maritime capacity-building training activities including management of living marine resources, law enforcement at sea, and preparation of operational missions, in practice the centre struggles with financing, staffing, and typically outsources training programmes.<sup>95</sup> The training events that do occur tend to focus on more kinetic maritime security challenges such as counter-piracy operations, rather than addressing structural development, environmental management, or regulative capacities.<sup>96</sup>

While it is still too early to quantify the impact of the DCOC and the JA on mitigating the environmental drivers of maritime insecurity, it is evident there are challenges. As a report by the Institute for Security Studies outlines, 'the DCOC+ is not a binding legal instrument . . . threats vary from country to country, and participating states differ on the definition and purpose of maritime security'.<sup>97</sup> Added to this is the precariousness of political will to maintain momentum, the overly ambitious scope of the amendment combined with ongoing rivalries and political disputes amongst the participating States.<sup>98</sup> Despite this, the JA shows that states could overcome historical disputes and cultural divides to agree on common maritime security goals.<sup>99</sup> Arguably, the JA has been successful simply for emphasising potential synergies between maritime law enforcement, the blue economy, and the safety of the marine environment. Menzel goes further and suggests, 'the Jeddah Amendment may even have the potential to serve as a policy model for further integrative maritime security efforts beyond its regional scope'.<sup>100</sup>

While the DCOC evolved to cover marine environmental issues as one of the drivers of maritime insecurity, other regional approaches specifically aim to manage and preserve coastal and marine ecosystems. In 2019, contracting parties

to the Nairobi Convention<sup>101</sup> agreed on a final draft of an Integrated Coastal Zone Management Protocol (ICZM). While ICZM policies have been enacted at a national level (in Kenya for example) this is the first time a regional ICZM protocol has been developed, mirroring other ICZM protocols, such as the 1995 Protocol on Integrated Coastal Zone Management in the Mediterranean. The protocol was a response to the growing intensity of human settlements and unsustainable socio-economic activities; natural disasters and climate change; inadequate coordination of marine sectors, habitat degradation and a decline in ecosystem services.<sup>102</sup>

### ***Marine spatial planning***

At the national level, the creation of Marine Spatial Plans (MSP) have emerged as novel governance tools to regulate human activities in maritime spaces in a more efficient and sustainable way. Several western Indian Ocean states have MSP in development, with Kenya, Seychelles and Mauritius at a more advanced stage. MSPs provide a more comprehensive framework for managing activities in the marine environment to achieve ecological, economic and social objectives.<sup>103</sup> These activities – such as industrial fishing, tourism, shipping, aquaculture, and harnessing offshore energy – usually exceed the capacity of marine areas to meet all the demands simultaneously.<sup>104</sup> Against this backdrop are environmental stressors such as sea-level rise, extreme weather events, and food insecurity that exist alongside structural issues such as poor regulation, user-group conflict, and disenfranchisement in coastal communities.

MSP processes can impact beyond regulating human activities at sea. If implemented on an extensive basis, MSP can directly support the attainment of multiple UN Sustainable Development Goals (SDGs), and can have implications for improving the negative impacts of climate change, biodiversity loss, and food insecurity, particularly in small island states, such as Seychelles.<sup>105</sup> Hence, developing MSP is an important step, not only to guide decision making for the blue economy, but also for resolving conflicts over ocean space.<sup>106</sup> Seychelles MSP, for example, has benefitted significantly from international capacity-building support through training, facilitation and software development alongside financial assistance through unique sources such as ‘debt for nature swaps’ and ‘blue bonds’.<sup>107</sup>

Given the transboundary nature of MSP, however, a regional strategy for the western Indian Ocean was published in 2021. This emphasised the need for a harmonised policy and legislative approach to drive national-level initiatives alongside the ability to mediate conflict and trade-offs among activities that are likely to affect multiple countries such as fishing, shipping, offshore windfarms, resource extraction and marine pollution.<sup>108</sup> The ambitious nature of MSP also requires the requisite political will and technical and enforcement capacity to be sustainable. The Regional Strategy acknowledged the ‘limited technical and human capacity and resources’ as a key governance challenge.<sup>109</sup> Specifically, this refers to (a) the capacity of stakeholders to engage in the process; (b) the institutional capacity to support the process; (c) human resources capacity to staff the process; and (d) technical capacity to provide the requisite expertise.<sup>110</sup>

## Enforcement and monitoring

A core issue with the designation of these zones and the creation of legislation is therefore the lack of capacity to enforce the new laws and regulations. The MSP in Seychelles, for example, is focused primarily on economic and environmental policies, but it has immediate consequences for law enforcement and will create new governance and legal frameworks. The Government of Seychelles acknowledged its ‘limited national capacity for prosecution and monitoring, control and surveillance’ in the Strategic Policy Framework and Roadmap Charting the future of the Blue Economy (2018–2030).<sup>111</sup> These capacity limitations are true for the majority of states in the region, even for Kenya, that possesses a large and relatively well-equipped naval service. Indeed, as Vogel highlights, traditional naval operations represent only a ‘small fraction of the commitments African security forces must meet’.<sup>112</sup> A much larger part of their mission set is ‘coast-guard in nature and relates to law enforcement, environmental protection, and maritime safety obligations that occur within a nation’s territorial waters and Exclusive Economic Zone’.<sup>113</sup>

These enforcement capacity limitations combined with Kenya’s ambitious blue economic agenda, alongside the appropriateness of a navy to enforce regulation in marine governance settings, resulted in the creation of the Kenya Coast Guard Service (KCGS) in November 2018. It assumed responsibility for enforcing maritime security and safety, pollution control and sanitation measures as well as the arrest and prosecution of offenders and the protection of marine resources including fisheries.<sup>114</sup> Specific areas under the KCGS remit include IUU fishing, border disputes, piracy, human and drug trafficking, illicit smuggling of contraband and goods, degradation of the marine ecosystems through discharge of oil or dumping of toxic waste, sand harvesting and destruction of coral reefs.<sup>115</sup> Neighbouring state Somalia, at one point had no capacity to patrol or enforce laws in its territorial waters. More recently, capacity-building efforts have aimed to bolster the nascent Somali Coast Guard. This has the dual advantage of not only potentially improving maritime security and marine environmental protection, but also bolstering the blue economic sector through building trust and encouraging external investment.<sup>116</sup>

As we have seen in previous sections, the effects of climate change and environmental stressors can impact on the fluctuation of disorder and maritime insecurity. However, they also have the potential to degrade the ability of enforcement agents, such as navies and coast guards, to respond to this disorder and police the maritime domain. This is important to acknowledge as it extenuates challenges and creates a vicious circle as maritime enforcement bodies are the front line in responding to illicit human activities at sea.<sup>117</sup> Climate change, environmental pressures and the subsequent potential for increased maritime insecurity, place greater demands for certain types of naval tasks.<sup>118</sup> These include humanitarian assistance and disaster relief, defence support to civil authorities, Maritime Domain Awareness, search and rescue, and sealift capabilities. Navies, therefore, are increasingly expected to be capable of conducting a wide range of tasks across the full spectrum of maritime operations both during times of peace and conflict.<sup>119</sup> This increased demand is likely to place extra pressure on maritime security agencies in the western Indian Ocean region in particular dealing with the activities of



people smugglers. Thus, stretching the already limited capacities of regional maritime security sectors, navies, and coast guards. According to Warner and Schofield, ‘The hazardous nature of people smuggling operations, which entail movement by sea in overcrowded and unseaworthy vessels, will . . . impose extra responsibilities on already overstretched regional navies and coastguards to respond to distress calls and escort people smuggling vessels to processing centres’.<sup>120</sup>

### **Maritime domain awareness**

A critical part of being able to counteract maritime criminality and enforcing marine regulations is having the capacity to know what happens at sea. This is often referred to as Maritime Domain Awareness (MDA) or ‘the effective understanding of anything associated with the maritime domain that could impact security, safety, economy, or environment’.<sup>121</sup> Achieving MDA is difficult even for countries with large, well-resourced maritime enforcement capacities, and so it is an acute challenge for western Indian Ocean states with less well-developed capabilities. Despite this, by effectively incorporating the right mix of both human intelligence and technological interfaces, states can gain a clearer maritime situational picture.<sup>122</sup> The Regional Maritime Rescue Coordination Center in Kenya, for example, uses both. Fisheries communities provide important local information that is synthesised with information from ‘high-tech’ systems such as the EU funded ‘Mercury’ system and the US funded ‘Sea-vision’ system, which provide a real time satellite picture of vessel movement.<sup>123</sup> MDA therefore can help detect maritime threats and develop responses and, in turn, help protect the economic and natural assets that underpin the Blue Economy.<sup>124</sup>

Others have suggested that promoting community-based or co-management approaches can encourage compliance and help mitigate against ‘poorly enforced’ top down conservation strategies.<sup>125</sup> Pinner et al. give two examples of such approaches – Secure Local Management in Madagascar and Beach Management Units in Kenya. Both approaches have ‘positive’ elements such as clearly defined membership rights, conflict resolution mechanisms, rights to organise, and congruence between rules and local conditions.<sup>126</sup> However, they still suffer from insufficient human and technical capacity in terms of monitoring of resources and surveillance.<sup>127</sup>

### **Building resilience**

Increasing community resilience in terms of poverty alleviation, safe and sustainable settlements; combatting climate change; and sustainable use of the oceans is explicit within the UN SDGs.<sup>128</sup> Despite this, the effectiveness of many resilience-building programmes is largely unknown.<sup>129</sup> This section explores some of the current approaches to building resilience in the context of environmental and maritime security threats as well as the capacity gaps that exist and how a disconnect between local practice and regional policy means that initiatives often falter due to a lack of community buy-in. This can surreptitiously lead to disenfranchisement, ecological damage, economic marginalisation, and increased grievance, disorder, and insecurity.



### ***Co-management approaches***

Just as co-management approaches can be adapted to strengthen compliance around marine governance regulation as discussed in the previous section, they can also reduce user conflict and improve resilience among fisher communities while also building capacity for improved fisheries management, strengthening food security, and empowering local livelihoods.<sup>130</sup> This relates to building ‘social-ecological resilience’ through ecosystem-based management approaches.<sup>131</sup> Here coastal communities become key stakeholders and not just arbitrary receivers of capacity building or passive adherents of top-down regulations often at odds with established local ways of doing things.

The introduction of Marine Protected Areas (MPA) in the western Indian Ocean, usually as part of a larger MSP, is an attempt at a more localised governance approach that tends to focus on sustainably managing sensitive fisheries ecosystems with recognition of local cultural values and practices.<sup>132</sup> This can in theory alleviate the type of economic marginalisation that drove some disenfranchised Somali fishers towards illicit activities to supplement a loss of income. In Kenya, there is a high degree of dependence on marine ecosystems by local coastal communities with most relying on fishing or fishery-related activities, including tourism and shipping.<sup>133</sup> MPAs are, therefore, important national economic assets that can help to mitigate the increasing demand and pressure on Kenya’s marine resources from a growing population and the potential impact of climate change.<sup>134</sup>

However, the effectiveness of the MPA’s has been questioned, particularly relating to lack of clearly defined objectives, uneven impacts, and insufficient evidence of the benefit for coastal communities.<sup>135</sup> For example, dissatisfaction among local artisanal fisher communities on the negative impact of marine parks in Kenya led to the creation of Locally Managed Marine Areas (LMMAs) to conserve fisheries and marine resources and as a way of securing alternative livelihood activities.<sup>136</sup> So, while MPA’s have capacity to improve livelihoods, according to a report by Mongabay, ‘critics counter that [MPAs] restrict local communities access to their ancestral fishing grounds, make them poorer and often increase conflict between them and people involved in park management or tourism’.<sup>137</sup> It is clear community buy-in is needed if initiatives such as MPA’s are to be effective. In Kenya, LMMAs often have higher acceptance among local communities than government MPAs and are therefore a promising alternative to maintain and restore ecological values in coastal areas.<sup>138</sup>

A project designed to build flood resilience by bolstering mangroves in Grand Sable, Mauritius is another good example of a co-management/ownership approach in practice. The project aimed to increase local community ownership and engagement for capacity building through, for example, consultation on the project design.<sup>139</sup> Local communities also participated directly in project implementation through, for example, planting and harvesting mangrove seeds. This approach illustrates that a ‘bottom-up participatory approach’ can reduce both exposure and vulnerability of communities to flood risk thereby helping to build the resilience of local ecosystems and reducing coastal risks for long-term adaptation.<sup>140</sup>

### **Alternative livelihoods**

Building capacity to promote alternative livelihoods is widely recognised as a core measure to build resilience against future manifestations of maritime insecurity.<sup>141</sup> In the western Indian Ocean region, this has largely focussed on Somalia and Somali refugee communities and can relate to both alternative livelihoods from criminality but also transitioning from a reliance on fisheries for example.<sup>142</sup> As previously mentioned, a significant amount of the maritime criminality in the region emanated from disenfranchised former fisher communities.

A core aspect of capacity building for countering Somali piracy, therefore, focussed on alternative livelihoods. Central to this was the UN Development Programme's 'Alternative Livelihoods to Piracy' project that aimed to raise awareness about the negative effects of piracy in coastal communities in Somalia, provide ex-pirates with vocational life-skill training, and engage in alternative means of livelihood.<sup>143</sup> In practice, this might include micro financing to support small business enterprises, the creation of cold storage units for fish, or the provision of fishing equipment.<sup>144</sup> Other alternative livelihood capacity-building approaches in Somalia focused specifically on natural resource management through a range of employment intensive environmental interventions. This approach recognises the nexus between environmental governance, development, and insecurity and the adverse effect a failure to address these concerns will have on local economies potentially driving marginalised youth towards migration, radicalisation or other forms of criminal activity such as piracy.<sup>145</sup>

Apart from infrastructure projects, training and education programmes, or reintegration projects to lure vulnerable people away from criminal lifestyles, other approaches aim to alleviate pressure on marine ecosystems and natural resources by promoting alternative income generating activities. This ranges from mariculture and aquaculture, to terrestrial agricultural projects, tourism, or environmental enforcement.<sup>146</sup> Community-based aquaculture in particular has been promoted as an important alternative income-generating activity. According to Ateweberhan et al., 'By diversifying coastal livelihoods, providing new skills, and improving participation and empowerment, community-based aquaculture has the potential to improve local economies and enhance food security, strengthening communities' adaptive capacity to climate change and other environmental threats'.<sup>147</sup>

Designing, implementing, and sustaining capacity supports to build resilience against environmental issues and maritime insecurity is not a straightforward process. It requires significant regional cooperation, social capital, and political will. As this section has illustrated, not all countries in the western Indian Ocean are equally inclined or indeed materially able to designate, monitor and effectively manage marine conservation areas and therefore most conservation actions are taken at a national or local level.<sup>148</sup> According to a report by the UNEP/Nairobi Convention, 'although ICZM and MSP schemes may be approved, the institutional reforms required for their implementation incur a political and administrative cost. The agencies responsible for the land, sea and foreshore may resist integration of their activities [and] tensions may arise between sectors and between local and national administrations'.<sup>149</sup> Van der Geest supports this assertion, and outlines in relation to

fisheries regulation, that ‘resource and capacity limitations of developing states and politicking are likely to impede the progression of any new treaty or amendments to the existing treaties’.<sup>150</sup> Therefore, given the novel and, at times, experimental nature of these approaches, lesson learning, increased community inclusion efforts, and extraction of best practices should be an ongoing task.

## Conclusion

In this article, I have attempted to show how environmental and associated developmental factors can both elicit and exacerbate insecurity in the maritime domain with a focus on the western Indian Ocean region. This can relate to the over-exploitation of marine resources by an extraterritorial state actor or the under-exploitation of resources by a littoral state struggling with capacity issues. In addition, extreme weather events, such as drought, and the potential for more damaging weather patterns due to climate change, can also drive criminality and insecurity and put pressure on maritime enforcement agencies already struggling with ageing assets, underinvestment, and limited MDA capability.

As has been illustrated, the cumulative impacts of climate change (e.g. sea level rise and ocean acidification), environmental degradation (e.g. the discharging of hazardous waste materials), and resource exploitation (e.g. overfishing) combined with other factors, provided a justification for piracy within disadvantaged coastal communities, damaged prospects for the sustainable development of Somalia’s ocean resources, and undermined trust in national institutions and international capacity-building efforts. In March 2017, the hijackers of the *Aris 13* oil tanker – the last successful Somali piracy hijacking at the time of writing – justified their operation by pointing to the continued existence of illegal fishing in Somali waters.<sup>151</sup> As Beebe outlines, ‘much of this could have been avoided had the world made a stronger commitment to conservation and environmental protection years earlier. Somalia provides a classic example of how problems related to poverty and the environment are increasingly evolving into traditional international security risks’.<sup>152</sup>

Responses in the region initially focused on containing piracy but evolved to meet the wider spectrum of maritime security threats. This shift recognised how mismanagement and poor governance of the ocean environment, its resources, and ecosystems are linked to disenfranchisement of coastal communities. It has been shown how this can exacerbate socio-economic dislocation leading to increased instability, criminality, and conflict. While multiple governance initiatives, such as the DCOC, MSP, and co-management and alternative livelihoods approaches have been designed to improve regional states resilience against interconnected environmental, developmental, and security threats, it is clear significant capacity gaps still exist. This relates to social capital and political will but also technical, institutional and human capacity and resources. Ambitious attempts to overcome these national capacity disparities by adopting a more integrated regional approach have tended to be disjointed. While in theory this integrated approach towards environmental and security-related issues is ‘highly promising’, its practical implementation requires ‘far-reaching structural changes’ both on land and in a maritime context.<sup>153</sup> Given the siloed and narrow sector-oriented nature of many national marine sectors and agencies in the western Indian Ocean (and elsewhere), integration, harmonisation and

cohesion is a significant challenge between local and national administrations, let alone at the regional level.

It is clear that a core factor in the spread of maritime insecurities, violence, and crime is the welfare of coastal communities. As the case of Somali piracy graphically illustrates, the economic marginalisation of already vulnerable populations (alongside other drivers) can lead to an escalation in criminality and violent disorder. A secure marine environment is therefore unlikely if coastal communities do not benefit from blue economic development, new coastal governance architectures, and international capacity-building projects. The accelerating impact of climate change has the potential to increase pressures on already vulnerable coastal populations in the future, leading to an escalation in the movement of people across maritime frontiers and with it increased transnational criminality. These issues need to be approached in a comprehensive way if policy and operational responses are to be effective and sustainable.

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## Disclosure statement

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