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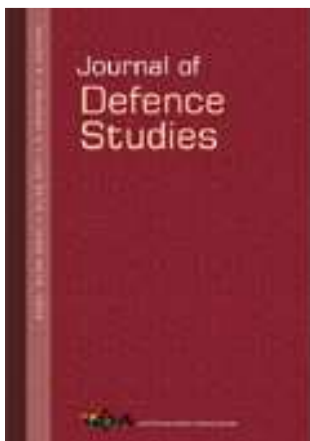
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Exploring Risks and Vulnerabilities: An Alternate Approach to Maritime Security Cooperation in the Indian Ocean Region

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*Lee Cordner**

Maritime security in the Indian Ocean Region (IOR) has become a central consideration. Shared risks and common vulnerabilities for state and non-state actors, generated by traditional and non-traditional security challenges, converge to a significant extent at sea. Risk-based approaches offer the potential for regional and extra-regional actors to engage in a constructive and non-confrontational dialogue that can assist collective security cooperation. Analyzing the evolving risk context, and assessing the risks and vulnerabilities, offers a sound basis for developing cooperative strategies for enhancing security in the maritime domain. Developing a regional strategic risk assessment, with a maritime security focus, should be a priority for IOR cooperative security entities. The Indian Ocean Rim Association (IORA) and the Indian Ocean Naval Symposium (IONS) could play significant roles in this work.

INTRODUCTION

The need to address maritime security challenges is increasingly being recognized in the Indian Ocean Region (IOR). The re-energized Indian Ocean Rim Association (IORA), for example, confirmed maritime safety and security as its top priority for action at the Council of Ministers meeting in Perth, Australia, from 29 October to 1 November 2013.[1] Providing maritime security is fundamentally about dealing with *risks*. Law and order

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at sea prevention and response, for example, and prevention, response and recovery from natural and man-induced disasters in the maritime domain are core to maritime security. The vast, diverse and disparate IOR maritime region poses significant security challenges, particularly in devising cooperative, coordinated and collaborative approaches to shared security challenges that transcend national maritime boundaries and are beyond the remit and capabilities of any single nation to address. This article addresses concepts of risk, vulnerability and maritime security in the IOR; presents an outline of an indicative IOR maritime security risk context review and risk assessment; and recommends that regional entities, like IORA and the Indian Ocean Naval Symposium (IONS), should consider advocating and initiating risk-based approaches for progressing regional maritime security cooperation.

Non-traditional maritime security problems are the primary focus of this analysis, while recognizing that the boundaries between non-traditional and traditional security issues tend to overlap to some degree. Inter-state conflicts and failed or failing states, for example, often generate and exacerbate non-traditional law and order problems at sea, like illegal immigration, marine pollution, piracy and other criminal activities. Conversely, non-traditional security problems, like illegal, unregulated and unreported (IUU) fishing and maritime border infractions, can inflame traditional security tensions and contribute to conflicts between states. Dealing with non-traditional maritime security in the IOR presents significant cooperative security challenges and provides opportunities for developing the mechanisms and habits for cooperation that may be of assistance in addressing traditional security concerns. Convergent interests in tackling non-traditional maritime security challenges present the 'low hanging fruit' for inter-state and inter-maritime force cooperation.

Risk, Vulnerability and Maritime Security

A significant task in developing common approaches to maritime security is to find a common basis, an agreed means and methodology, for understanding problems and developing options for dealing with them. Common approaches need to be based upon shared perspectives that will underpin uncontroversial and non-threatening collaborative strategies for enhancing mutually beneficial maritime security. Risk management approaches, if employed assiduously, can assist with developing *shared understandings of threats to common objectives*, and importantly, can help to *identify shared opportunities for mitigating commonly held risks*, *and reducing*

vulnerabilities. Risk-based approaches are tried, tested, internationally accepted and widely employed in the commercial sector, and increasingly by governments and government agencies around the world.

Concepts of risk, in an international context, were advocated by Ulrich Beck in his *World Risk Society* and related works.[2] Beck posed several notions that resonate in the IOR today. He suggested that in modern society, the 'very idea of controllability, certainty or security… collapses' and a paradigm shift has occurred to present a 'world risk society' where Western and non-Western societies share the same space, time and challenges.[3] He suggested that 'risk communities' with shared risks generated the need for cooperative approaches to dealing with massive challenges that are beyond the capability and mandate of any single nation-state or collective entity to address.[4] The IOR could be viewed as one such 'risk community'. He coined the term 'Cosmopolitan Condition'[5] to describe the contemporary circumstance where common threats to society transcend national boundaries and include 'conditions of manufactured uncertainty'[6] that are created by the actions of man. Beck asserted that 'we are moving from a world of enemies to one of dangers and risks' and that risk 'is the modern approach to foresee and control the future consequences of human action, the various unintended consequences of radicalized modernity'. He advocated that risk analysis requires an interdisciplinary approach that 'demands an opening up of the decision-making process, not only of the state but of private corporations and the sciences as well'.[7] Beck's writings stimulated numerous commentary and critiques, with his concepts lauded by some and criticized by others.[8] The environmental security community, in particular, has embraced his concepts.[9]

Risk Management

Risk management is fundamentally about adopting a structured approach to dealing with uncertainty. The International Organization for Standardization (ISO) 31000:2009, *Risk Management—Principles and Guidelines*, presents an internationally accepted conceptual framework and process outline.[10] Internationally, ISO 31000 approaches are widely embraced by industry; they are deeply inculcated into corporate culture and processes and are foundational to management philosophy and practice. Managing risk permeates all levels of endeavour, including corporate and strategic-level decision making, strategic leadership and management under the guise of Enterprise Risk Management (ERM).[11]

ERM, and risk management more broadly, is increasingly being applied in the government sector; the Royal Australian Navy, for example, operates within an ERM framework.[12]

ISO 31000 does not provide the entire answer to the quest for enhanced maritime security cooperation in the IOR; however, it provides a useful starting point for developing common understandings and approaches that may lead to enhanced cooperation. Essential elements of risk management with regard to IOR maritime security are as follows:

1. *Risk* is the 'effect of uncertainty on objectives'.[13] This simple and concise definition seems straightforward; however, it assumes the existence of an *organization* that has *objectives*.

2. The primary focus in the IOR maritime security context needs to be on the integrating and interconnected nature of the sea as it affects the objectives of those ashore. The nexus between organizations as systems and the IOR as a system that functions within and contributes to the international system is consistent with general systems and international relations theories.[14] Viewing the IOR as a *virtual organization* that is an *open, expansive and inclusive maritime system, a composite oceanic and littoral region in which regional and extra-regional actors have common objectives, interests and shared risks and vulnerabilities*, presents a workable basis for this analysis.

3. The *risk management process* requires 'communication and consultation' in development and application combined with 'monitoring and review'; a feedback loop is essential to ensure that it remains relevant and current.[15]

4. There are three broad phases to managing risk comprising components of a continuous cycle:[16]

   • *Establishing the context* entails articulating objectives, defining external and internal parameters and setting the scope and criteria for subsequent steps of the process; note that the need to understand the security context is consistent with traditional military strategic concepts that emphasize the importance of 'understanding the nature of a war'.[17]

   • *Risk assessment* is the overall process of identifying, analyzing and evaluating risks.

   • *Risk treatment* involves selecting and applying options for removing, modifying or tolerating risks. Treatment options

can include avoiding risks, taking risks in order to pursue opportunities, removing the sources of risk, sharing risk, retaining (or accepting) risk and changing the likelihood or consequences of risk.

Vulnerability

Unlike risk, there is no common, internationally accepted definition of vulnerability, although several exist in environmental and other literature.[18] A workable concept of vulnerability is needed as an adjunct to risk because the probability and scale of hazards are not always numerically measurable; qualitative analysis is required in addition to quantitative analysis. Vulnerability rather than risk becomes the construct for devising security responses. The actions of irrational actors, like suicide bombers, and the aggregated and cumulative impacts of climate change, for example, are almost impossible to predict with any degree of confidence. For the purposes of this analysis, vulnerability is defined as *the state of susceptibility to harm from exposure to risks posing unquantifiable uncertainty combined with insufficient capacities to prevent, respond or adapt*.

Maritime Security

There is no single, internationally accepted definition of maritime security. Bateman characterized the inability for regional countries in the Asia-Pacific to agree on a definition as a 'basic wicked problem' that presents difficulties for endeavours to develop regional cooperative approaches.[19] Notably, security and risk in academic literature has largely been separated because the security community and risk management communities have divergent histories and, until recently, had 'hardly "spoken" to one another'. The nexus between risk and security has been highlighted in recent securitization discourse by the 'increased focus on terrorism, climate change and other catastrophic transnational threats' that has brought the two fields closer together by providing a 'common empirical theme'.[20] Jayasuriya drew attention to the 'particular logic of security as risk management' that has caused the 'spatial and temporal boundaries of security' to shift 'from the national level' to a more regional approach.[21]

Intellectual and practical challenges are presented in devising useful policy options in the diverse IOR environment because risk and security are, to an extent, culturally and contextually defined.[22] Considerations include the communal nature of risk and security concerns, noting that

impacts will vary for different actors within a common system. How this translates into incentives to adopt collective and cooperative security risk mitigation strategies is the key. For example, the impact of extreme weather events and sea-level rise may be catastrophic for some in the IOR and a manageable annoyance for others. Geographic location and economic and human factors affect capacities to adapt and respond. However, massive human tragedies and related mass migration will affect *all* participants in the IOR to a greater or lesser extent; the risks are shared.

In the IOR context, maritime security needs to be considered broadly and inclusively as it intersects and overlaps with notions of economic, environmental, energy and human security in the maritime domain. A composite definition of maritime security is proposed as follows:

> Maritime security is a comprehensive concept that derives from the systemic nature of the maritime domain presenting multiple and interrelated requirements for cooperative security by state and non-state actors; it addresses traditional and non-traditional security challenges. Maritime security involves coordinating collective and cooperative risk mitigation and vulnerability reduction efforts in order to protect and promote national, regional and global vital interests, objectives and core values, including those relating to state sovereignty, freedom of navigation, economic development, environment and ocean resources, human and social development, and political stability.

ANALYZING THE RISK CONTEXT: MARITIME SECURITY RISK CONTEXT OVERVIEW

A brief outline of the product of an evolving and independent review of IOR maritime security strategic-level risks and vulnerabilities is presented as an example of what such an approach can offer. This work is not comprehensive or complete; most of the detailed supporting analysis has been omitted.

The maritime security risk context overview is presented under the following headings: law of the sea; environment and ocean resources; energy; economy, trade and globalization; social cohesion and development; potential for inter-state conflict; and regional security architecture. A forward-looking time horizon of 30 years and beyond is necessary to consider trends for issues like climate change. Proposed, generic strategic objectives for the IOR maritime security system, derived from the risk context analysis, are provided at the end.

Law of the Sea

The United Nations Convention on the Law of the Sea (UNCLOS) provides a framework for global oceans governance.[23] Numerous subordinate international regimes for the maritime domain are also pertinent.[24] Most IOR littoral states and significant extra-regional states have ratified UNCLOS, with IORA member states, Iran and UAE (both signatories in 1982 but not yet ratified), and non-IORA states, Eritrea and Israel, being the exceptions; the United States (US) is the only significant external maritime power that is not a signatory. UNCLOS is very much ensconced as customary international law and variously employed by all actors in the international maritime system. It is based upon a series of compromises designed to provide 'good order at sea', while considering the oceanic interests of states and other actors.[25]

Maritime Sovereignty

Maritime sovereignty comprises a state's rights and responsibilities for oceanic domains. It underpins traditional security issues, like border security, as well as non-traditional security factors like resource and environmental exploitation and protection. Most maritime boundaries in the IOR have been satisfactorily delimited.[26] Varying interpretations of UNCLOS by states can magnify jurisdictional tensions.[27]

Freedom of Navigation

The Indian Ocean sea lanes of communications (SLOCs) are vitally important to the interests of regional and extra-regional actors. Freedom of navigation to facilitate trade and permit the legitimate passage of warships and other activities, like scientific research, is a foundational principle of UNCLOS. Declarations made by littoral states that seek to impose some level of restriction on transit, for example, through the Malacca Straits, the Straits of Hormuz or Bab el Mendeb, can be problematic.[28] Some major maritime powers with significant interests in the IOR, like China and India, have allegedly taken an 'expansive view of coastal state authority', which puts them at odds with the US that champions liberal interpretations of freedom of navigation: a long-term 'strategy of assured access to the global commons as an enduring American security interest'.[29] For example, *2013 Freedom of Navigation Report* by the US Department of Defense alleges that China exceeds UNCLOS with: 'Excessive straight baselines; security jurisdiction in contiguous zone; jurisdiction over airspace above the exclusive economic zone (EEZ);

domestic law criminalizing survey activity by foreign entities in EEZ; prior permission required for innocent passage of foreign military ships through territorial sea', while India, it is alleged, requires 'Authorization... for military exercises or maneuvers in EEZ'.[30]

Conservation and Protection of the Marine Environment and Resources

The need for management, conservation and protection of the marine environment and oceanic resources is the central tenet of oceans governance. UNCLOS-advocated comprehensive and integrated approaches to oceans governance are not generally implemented in areas within national jurisdiction in the IOR, although there are efforts in this direction.[31] Efforts to promote integrated oceans governance in the IOR high seas are also at a nascent stage.[32] Critically, many IOR littoral states have limited capabilities to effectively manage and police their maritime jurisdictions.

Environment and Ocean Resources

Environmental and ocean resource issues, exacerbated by the impacts of climate change, are emerging as the greatest maritime security-related challenges for the IOR in the medium to long term.[33] Regional fisheries and other resources are under increasing pressure.[34]

Notably, the IOR littoral includes vast coastal zones, and the maritime security implications of issues that arise in the area of interface between the land and the oceans require consideration. Sea levels and sea temperatures are predicted to rise. When combined with the forecast increased incidence and severity of extreme weather events, these factors are likely to have dire consequences in the IOR where vast populations live in low-lying coastal zones and rely to a significant extent on the sea for their livelihoods.[35]

Climate change, environmental degradation, resource scarcity and natural disasters will have profound geostrategic implications in the IOR. The effects will transcend borders; many IOR states are extremely vulnerable, they have little capacity to mitigate, adapt and respond. This emerging issue presents a compelling imperative for enhanced maritime security cooperation; the cumulative impacts will overwhelm national and regional resources.

Energy

Energy security in the IOR is crucial to global and regional economic

stability and development; access to West Asian oil remains a vital issue. The IOR SLOCs are the world's most strategically important energy trade routes, with the Strait of Hormuz the main oil supply link between the Persian Gulf and the rest of the world; much of this oil also passes through the Malacca Strait. The geopolitics of world energy is, however, changing.[36] The renewed focus upon domestic energy supplies in the US, combined with expanding dependence upon imported energy by China and India, has major strategic significance. The imperative for the world's greatest sea power, the US, to support energy security in the IOR is declining, while the strategic stakes for China and India continue to rise.

Energy—oil, gas and coal—demand by India and China is forecast to massively increase into the medium term. India's demand for energy, for example, is projected to increase by 110 per cent by 2030; the vast majority of this will be imported by sea.[37] Energy security and maritime security will be increasingly convergent.

Economy, Trade and Globalization

The emerging prominence of the IOR economically and as a maritime trade route is well documented. While some economies in the IOR continue to experience strong growth, uneven economic development is profoundly evident; regional economies are largely commodity based and the economic outlook is fragile.[38]

The pressures that globalization imposes are heightened in the IOR due to grossly uneven effects for states, institutions and peoples. More advanced states, like Australia, India and South Africa, are able to participate effectively in the globalized economy and have some capacity to adapt to issues like climate change. Developing IOR states are less able to participate and are likely to become increasingly marginalized and disenfranchised, thereby generating regional problems that will impact IOR security.[39] Globalization and economic factors pose risks and opportunities.

Social Cohesion and Development

Lack of social homogeneity, diversity and conflict are defining characteristics of the IOR. The majority of the world's refugees, internally displaced persons (IDPs) and 'international migrants' seeking a better life are harboured in parts of the IOR. Large-scale people displacements are the result of political violence and civil war; religious, racial and ethnic intolerance and discrimination; economic and environmental

disadvantage; and natural/man-made disasters.[40] Massive migration generates enormous economic, social, political and security challenges around the IOR that are likely to intensify. There are major implications for regional stability, and maritime security.[41]

Social, political and economic disintegration provide fertile environments for law and order problems to proliferate. Crime, that is, trafficking and smuggling of drugs, arms and people, as well as piracy and IUU fishing flourish where institutions are weak or non-existent. The number of non-state actors impacting security is reported to be growing substantially, including the prospect of greater linkages between criminals, insurgents and terrorist groups.[42]

Inter-state Conflict

The largest emerging maritime inter-state issue is the possibility of strategic rivalry between China and India which, until recently, had entailed territorial disputes on land.[43] As US-assured maritime security declines, China, India and other states must increasingly look to providing their own security insurance. China and India have expanding strategic and economic power combined with national security agendas that significantly focus upon maritime strategy and sea power; they are both making considerable investments in naval forces.[44] The rapid rise of Chinese military power is putting India and the US in a challenging position and China is extremely strategically vulnerable owing to dependence upon IOR SLOCs that are straddled by India and pass through narrow choke points at the northwest and northeast corners.[45] Opportunities for strategic miscalculation at sea will inevitably arise as the two Asian great powers project power, endeavour to assert sea control and attempt to establish spheres of strategic influence. Indian Ocean regional conflicts on land have repeatedly had maritime security consequences.[46]

The possession and proliferation of weapons of mass destruction (WMD), particularly nuclear weapons, remains a most troubling transnational problem. India, Pakistan, Israel and potentially Iran possess nuclear weapons, along with the US, China, France, Russia and Britain who have the capability to deploy nuclear weapons into the region. There exists the possibility of strategic miscalculations between nuclear states having dire consequences, and the abiding prospect of WMD falling into the hands of terrorist organizations.[47]

Most regional states have limited maritime enforcement and defensive capabilities; many are unable to effectively patrol marine areas under their

national jurisdictions. The lack of national capabilities is exacerbated at regional and sub-regional levels by the lack of cooperative bodies to coordinate sparse resources and manage crises. Western powers remain engaged, particularly in West Asia, in support of their interests in global energy security and in dealing with the sources of Islamist extremism. The involvement of external states helps to stabilize regional security. In many cases, such involvement is essential to make up for shortfalls in the security capabilities of regional states, although external intervention is not universally welcomed by regional states.[48]

Regional Security Architecture

There are no IOR-wide multilateral security architectures and mechanisms specifically designed for dealing with maritime security and other security dialogue and cooperation at the government-to-government level. IORA does not include security in its charter and its membership is restrictive; several important IOR littoral states are not members, for example, Saudi Arabia, Pakistan and Myanmar. There is reported to be little appetite among existing members to countenance expansion.[49] However, maritime security and related matters are increasingly on the IORA agenda.[50] The only region-wide maritime cooperation entity that considers security matters is IONS, which has an expansive membership of maritime security force leaders, and primarily deals with operational and technical cooperation between regional maritime forces.[51]

IOR Strategic Objectives for Maritime Security

Fifteen generic IOR strategic objectives with maritime security salience have been derived from the context analysis and are presented in Table 1. There will inevitably be divergence about priorities between some IOR actors, and objectives may even be in conflict to an extent in some cases, for example, freedom of navigation could be seen to contradict interpretations of maritime territorial sovereignty in some circumstances.

Table 1 IOR Strategic Objectives for Maritime Security

1. Attain and sustain maritime territorial sovereignty.
2. Assure freedom of navigation in accordance with UNCLOS.
3. Implement effective conservation, protection and management of the marine environment in areas within national jurisdiction and the high seas.
4. Address the uneven effects of globalization across the IOR system.
5. Promote economic development and enhance intra-regional and extra-regional maritime trade.

6. Ensure the integrity of energy (oil, gas and coal) maritime supply routes throughout the IOR.
7. Assert effective, sustainable control over fish and other resources (including energy and minerals) within areas of national jurisdiction and the high seas.
8. Implement effective measures to address the impacts of climate change.
9. Implement effective management of the coastal zone around the IOR littoral.
10. Develop cooperative IOR natural disaster response and recovery mechanisms.
11. Promote social tolerance, cohesion and stability founded upon economic and societal development and integration.
12. Impose law and order consistent with international regimes and norms.
13. Establish a nuclear weapons and other WMD-free zone in the IOR; prevent WMD proliferation, particularly nuclear weapons; remove nuclear weapons and WMD; prevent extra-regional states and other actors bringing WMD into the IOR.
14. Encourage political order in IOR states and promote regional stability.
15. Develop regional maritime security dialogue and cooperation architectures in the IOR.

Source: Author.

IOR MARITIME SECURITY RISK ASSESSMENT

The risk context provides the basis for the *risk assessment*. The risk assessment aims to identify factors that may threaten the achievement of defined objectives and importantly, it can be used to highlight opportunities that can be pursued towards achieving objectives. A significant outcome of the risk assessment process is to identify priorities that will inform subsequent treatment options.

Risk Criteria

A generic or typical 'risk criteria' framework is employed in this analysis as outlined in Tables 2 and 3. A risk criteria framework provides a useful tool for developing comparative perspectives of the relative imperatives to address particular risks. This usually involves consideration of the *likelihood* of a risk arising, along with the *consequences*, should it occur. The combination of likelihood and consequence can be used to determine the overall level of risk, known as the 'risk profile'.[52] In the IOR maritime security case, the primary requirement is to identify system-wide risks and analyse and evaluate often cumulative, aggregated and interdependent

consequences. This involves primarily qualitative analysis based upon experienced judgement.

Table 2 Risk Criteria

Likelihood	*Consequences*	*Risk Profile*
Probability of a Risk Occurring	*Impact Upon the IOR Maritime System*	*Combined Assessment of Likelihood and Consequence*
Almost Certain	Extreme	1 Very High
Probable	Serious	2 High
Possible	Major	3 Medium
Unlikely	Minor	4 Low
Remote	Negligible	5 Very Low

Source: Author.

The combined *likelihood*, *consequence* and *risk profile* can more effectively be presented in tabular form. The combined impact of likelihood and consequence is often not a direct one. For example, a risk that has 'Extreme' consequences and is 'Almost Certain' to occur would be assessed as 1, that is, 'Very High'; and a risk with 'Serious' consequences and 'Remote' likelihood would be assessed as 4 or 'Low'.

Table 3 Risk Profile Matrix

Consequence	*Likelihood*	*Almost Certain*	*Probable*	*Possible*	*Unlikely*	*Remote*
Extreme		1	1	2	3	3
Serious		1	2	2	3	4
Major		2	2	3	3	4
Minor		3	3	4	4	5
Negligible		5	5	5	5	5

Source: Author.

IOR Maritime Security Risks

Table 4 shows the 19 IOR maritime security risks have been identified from the risk assessment.

Table 4 IOR Maritime Security Risks

1. Transgressions of sovereignty in the territorial sea.
2. Transgressions of sovereignty in the EEZ.
3. States asserting unreasonable maritime sovereignty claims.
4. State closures of international straits, archipelagic sea lanes and/or areas within national jurisdiction.

5. State restrictions on freedom of navigation in international straits, archipelagic sea lanes and/or areas within national jurisdiction.

6. Non-state actors impinging upon freedom of navigation (piracy, maritime terrorism).

7. Impacts of climate change on the marine environment.

8. Illegal exploitation of marine living resources, in areas of national jurisdiction and the high seas.

9. Marine pollution and dumping.

10. Inadequate regulation and control of the marine environment.

11. Sea-level rise and increasing intensity and frequency of extreme weather events in IOR coastal zones and islands.

12. Law and order at sea transgressions: crime, piracy, robbery, smuggling, trafficking, illegal immigration, IUU fishing.

13. Disruption of energy cargoes at sea.

14. Offshore oil and gas safety and security incidents.

15. Transportation and deployment of WMD, primarily nuclear weapons, at sea.

16. Local, state on state, conflict spilling into the maritime domain.

17. Maritime intervention (power projection, asserting sea control) by major powers in the IOR.

18. Safety at sea.

19. Lack of IOR architecture and entities to facilitate regional maritime security dialogue and cooperation.

Source: Author.

IOR Maritime Security Risk Assessment Matrix

The IOR maritime security risk assessment outcomes are collated in Table 5. The number code represents the overall level of risk or *risk profile*. An 'x' indicates strategic objectives impacted by a particular maritime security risk (MS Risk).

The composite picture of risks against objectives presents a useful strategic overview that can highlight discontinuities and areas of convergence. Opportunities are presented for targeting collective and cooperative maritime security risk mitigation and risk treatment efforts. A concise supporting narrative is also necessary, which is beyond the scope of this article. Shortcomings inherent in this kind of coarse presentation of relative risk profiles need to be recognized. Care needs to be taken to recognize that the granularity and important nuances of the risk assessment can be suppressed in some instances; particularly important in a strategic-level risk assessment for a complex system, like the IOR.

Table 5 IOR Risk Assessment Matrix

Strategic Objective	MS Risk	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Risk Profile		1	2	2	3	3	3	2	2	2	2	1	3	2	3	3	3	2	3	1
1		x	x	x	x	x	x		x	x	x		x		x	x	x	x		x
2				x	x	x	x						x	x	x	x	x	x	x	x
3		x	x	x				x	x	x	x		x		x		x	x	x	x
4					x	x		x				x	x	x				x		x
5				x	x	x	x		x			x	x	x			x	x		x
6				x	x	x	x						x	x	x		x	x		x
7		x	x	x			x	x	x	x	x		x		x			x		x
8									x		x	x								x
9		x		x					x		x	x	x				x			x
10									x			x					x	x		x
11				x	x	x	x	x					x	x			x	x	x	x
12		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13		x		x									x			x	x	x		x
14		x	x	x	x	x		x	x	x		x	x	x	x	x	x	x		x
15		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Source: Author.

Risk treatment, the next phase of the risk management continuum, lies beyond the scope of this article. Regional and extra-regional state and cooperative entities, in collaboration and consultation with regional maritime security forces and other national and multilateral agencies, need to develop cooperative strategies for treating the risks. Developing and implementing effective strategies requires a comprehensive, shared understanding of the context and common risks and vulnerabilities.

CONCLUDING SUMMARY AND RECOMMENDATIONS

In this overview of the IOR strategic risk context and risk assessment, the sea clearly emerges as an essential common medium for internal and external actors, primarily nation-states. The IOR SLOCs are central to regional trade and vital to the global economy. As the global economic and strategic balance swings towards Asia with India, Indonesia and other Indian Ocean states emerging, and as an increasingly powerful China looks South and West, so the geopolitical focus on the Indian Ocean magnifies.

Changes in regional power balances, with China and India rising and the US relatively declining, are major factors that impact security.

Critically, the potential consequences from climate change are likely to have the greatest impact in the medium to longer term, and much of the region is ill-prepared to cope or adapt. Profound challenges to regional environmental, human, food and economic security will be presented. Many IOR states have little capacity to fulfil their responsibilities for managing marine zones. Exploitation, pollution and water-security infringements largely proceed unchecked in many national jurisdictions, and in the high seas. Few regional countries have the capacity to deal with massive human tragedies and environmental damage to coastal areas forecast to arise from repeated natural disasters. The lack of national capabilities is exacerbated by the lack of regional bodies to coordinate the use of sparse resources.

There is much uncertainty, which equates to unmitigated risks, in the IOR maritime security context. Understanding risks and vulnerabilities in the IOR presents the potential for regional actors to engage in a positive, constructive and non-confrontational analytical approach that will assist in defining common maritime security challenges and opportunities, and help identify collective and cooperative security strategies. Risk management offers methodologies for defining collective risk mitigation strategies: regional agendas for action.

The opportunity exists for nations to cooperate to protect vulnerable shared interests and further common objectives without significantly compromising territorial integrity or sovereignty against a range of risks that no single state has the ability to address. Effective maritime security cooperation, driven by assessments of risk, will become increasingly necessary to address security challenges common to regional and extra-regional actors.[53] Cooperative maritime security could bind a diverse and largely disaggregated IOR.

This strategic analysis of the IOR maritime security risk context and outline risk assessment has demonstrated that a risk-based approach offers utility. This indicative first step needs to be followed by an evaluation of mitigation options, and then concerted and coordinated *action*.

The following actions are recommended:

- Commission a multinational, multidisciplinary team of experts to conduct a regional strategic risk assessment, with a specific focus upon maritime security, leading to proposals for enhanced

IOR maritime security cooperation. IORA and IONS could both be involved in leading this.

- Expand the priority IORA agenda to include the maritime impacts of climate change to compliment maritime safety and security, disaster response and fishing.
- Expand IORA membership to be more inclusive of IOR littoral states.
- Create Track 2/Track 1.5 IOR security dialogue entities. The Indian Ocean Research Group (IORG)[54] could provide a foundation, if appropriately supported and resourced.
- Consider creating a separate Track 1 IOR security dialogue entity or elevate IORA to the summit level and expand the terms of reference to include heads of government and security dialogue.

There is a rising and compelling imperative to develop maritime security cooperation in the IOR to address primarily non-traditional, along with traditional, security risks and vulnerabilities. The maritime domain is where the collective interests and common security concerns of regional and extra-regional states largely converge. Both regional and extra-regional actors, those with interests in the Indian Ocean and the capacity to assist, need to be included in dialogue and cooperative arrangements. Combined risk, vulnerability and security approaches offer the potential for progress; they need to be embraced with alacrity.

<div align="center">Notes</div>

1. See IORA, available at http://www.iora.net/, accessed 30 January 2014. At the 2013 IORA Council of Ministers meeting in Perth, Australia, a six-point priority agenda was confirmed, with four of the six priorities potentially involving enhancing maritime security: (i) maritime safety and security; (iii) fisheries management; (iv) disaster risk management; and (v) academic, science and technology.

2. Ulrich Beck has written prolifically about the conceptual implications of international risk in modern society. Key works include: Beck, U., *Risk Society: Towards a New Modernity*, London: Sage, 1992; *World Risk Society*, Cambridge: Polity Press, 1999; 'The Cosmopolitan Perspective: Sociology of the Second Age of Modernity', *British Journal of Sociology*, Vol. 51, No. 1, 2000, pp. 79–105; 'The Terrorist Threat: World Risk Society Revisited', *Theory, Culture & Society*, Vol. 19, No. 4, 2002, pp. 39–55, available at http://tcs.sagepub.com.proxy.library.adelaide.edu.au/content/19/4/39.

full.pdf+html, accessed 2 January 2013; 'The Cosmopolitan Condition: Why Methodological Nationalism Fails', *Theory Culture & Society*, Vol. 24, Nos 7–8, 2007, pp. 286–90, available at http://tcs.sagepub.com/content/24/7-8/286, accessed 30 January 2013; 'Critical Theory of World Risk Society: A Cosmopolitan Vision', *Constellations*, Vol. 16, No. 1, 2009, pp. 3–22; and 'World Risk Society and Manufactured Uncertainties', *Iris: European Journal of Philosophy and Public Debate*, Vol. 1, No. 2, 2009, pp. 291–99, available at http://web.ebscohost.com.proxy.library.adelaide.edu.au/ehost/pdfviewer/, accessed 2 January 2013.

3. Beck, *World Risk Society*, p. 93.

4. Ibid., pp. 16–62.

5. Beck, 'The Cosmopolitan Condition'.

6. Beck, *World Risk Society*, pp. 6–13.

7. Ibid.

8. For commentary and critiques that are generally in support of Beck's theses, see Giddens, A., 'Risk and Responsibility', *The Modern Law Review*, Vol. 62, No. 1, 1999, pp. 1–10 and *The Third Way and its Critics*, Cambridge: Polity Press, 2000; Latour, B., 'Is Re-modernization Occurring—And If So, How to Prove It?: A Commentary on Ulrich Beck', *Theory, Culture & Society*, Vol. 20, No. 2, 2003, pp. 35–48, available at http://tcs.sagepub.com/content/20/2/35, accessed 30 January 2013 and 'Whose Cosmos, Which Cosmopolitics? Comments on the Peace Terms of Ulrich Beck', *Common Knowledge*, Vol. 10, No. 3, 2004, pp. 450–62, available at http://muse.jhu.edu/journals/ckn/summary/v010/10.3latour.html, accessed 31 January 2013; and Rossi, I (ed.), *Frontiers of Globalization Research: Theoretical and Methodological Approaches*, New York: Springer, 2007. For significantly negative critique of Beck's concepts, see Mythen, G., *Ulrich Beck: A Critical Introduction to the Risk Society*, London and Sterling, Virginia: Pluto Press, 2004 and 'Reappraising the Risk Society Thesis: Telescopic Sight or Myopic Vision?', *Current Sociology*, Vol. 55, No. 6, 2007, pp. 793–813, available at http://csi.sagepub.com/content/55/6/793, accessed 30 January 2013; Mythen, G. and Walklate, S., 'Criminology and Terrorism: Which Thesis? Risk Society or Governmentality?', *British Journal of Criminology*, Vol. 46, 2006, pp. 379–98, available at http://bjc.oxfordjournals.org/, accessed 30 January 2013.

9. See multiple references to Beck's concepts in Brauch, H.G., Spring, U.O., Mesjasz, C., Grin, J., Kameri-Mbote, P., Chourou, B., Dunay, P. and Birkmann, J. (eds), *Coping with Global Environmental Change, Disasters and Security: Threats, Challenges, Vulnerabilities and Risks*, Berlin and Heidelberg: Springer, 2011.

10. Published in Australia as Australian Standard (AS)/New Zealand Standard

(NZS), *Risk Management—Principles and Guidelines* (AS/NZS ISO 31000:2009), Sydney: Standards Australia, 2009.

11. See Fraser, J. and Simkins, B. (eds), *Enterprise Risk Management*, New Jersey: John Wiley & Sons, 2010, for comprehensive analyses of ERM.

12. In 2011, the Chief of the Royal Australian Navy directed an ERM review of the navy. This contributed to ERM being inculcated as a central approach to conducting core navy business as a strategy and risk-driven enterprise; an integrated component of the Australian Defence Force (ADF) and Australian Defence Organisation (ADO).

13. AS/NZS ISO 31000:2009, p. 1.

14. For theoretical concepts of organizations as systems in organizational design and international relations literature, see Clegg, S. and Dunkerley, D., *Organization, Class and Control*, London and New York: Routledge & Kegan Paul, 1980, pp. 175–77; Shafritz, J. and Ott, J. (eds), *Classics of Organization Theory*, 2nd edition, Chicago: The Dorsey Press, 1987, pp. 234–39; Keal, P., 'International Society and European Expansion', in R. Devetak, A. Burke and J. George (eds), *An Introduction to International Relations*, 2nd edition, Cambridge and New York: University Press, 2012, pp. 246–49; Rourke, J., *International Politics on the World Stage*, 4th edition (rev.), Connecticut: The Dushkin Publishing Group, 1993, pp. 32–83.

15. AS/NZS ISO 31000:2009, pp. 3–4, 7, 12–15, 20–21; HB 158, *Delivering Assurance Based on ISO 31000:2009 Risk management—Principles and Guidelines*, 2nd edition, Australia: Standards Australia, 2010, pp. 12–13, 18–19.

16. AS/NZS ISO 31000:2009, pp. 3–6, 15–20; HB 158, *Delivering Assurance*, pp. 12–18.

17. Howard, M. and Paret, P. (eds), *Carl von Clausewitz: On War*, Princeton: Princeton University Press, 1976, p. 88; also, see Corbett, Julian, *Some Principles of Maritime Strategy*, London: Longmans, Green and Co., 1911, pp. 25–26.

18. See Brooks, N., Adger, W. and Kelly, P., 'The Determinants of Vulnerability and Adaptive Capacity at the National Level and the Implications for Adaptation', *Global Environmental Change*, Vol. 15, No. 2, 2005, pp. 151–63. Definitions of *risk* in nature are commonly problematic because multiple, largely unrelated factors combine to make assessments of the likelihood of a 'hazard event' triggering 'a disaster or series of events with an undesirable outcome', therefore *vulnerability* was more useful although it 'depends critically on context'. Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani,

J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds), Cambridge, UK: Cambridge University Press, 2007, available at http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm, accessed 27 August 2013, contained two definitions of *vulnerability*: 'The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity' or alternatively, the 'degree to which a system is susceptible to injury, damage, or harm (one part—the problematic or detrimental part—of sensitivity)', with sensitivity, in turn, described as the 'degree to which a system is affected by or responsive to climate stimuli'. Adger, W., 'Vulnerability', *Global Environmental Change*, Vol. 16, No. 3, 2006, p. 268, defined vulnerability as 'the state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt'. Brauch, H., 'Concepts of Security Threats, Challenges, Vulnerabilities and Risks', in H.G. Brauch et al. (eds), *Coping with Global Environmental Change, Disasters and Security*, pp. 67–68, considered vulnerability to be a '*complex* process encompassing multiple intricate dimensions' that is constantly changing. Brauch suggested vulnerability had two distinct features: 'exposure and insufficient capacities' that encompassed physical and sociological exposure to risk; and the lack of capacity to prevent, prepare for and respond to 'hazards and disasters'.

19. Bateman, S., 'Solving the "Wicked Problems" of Maritime Security: Are Regional Forums up to the Task?', *Contemporary Southeast Asia*, Vol. 33, No. 1, 2011, pp. 1–28.

20. Petersen, K., 'Risk Analysis—A Field within Security Studies?', *European Journal of International Relations*, Vol. 18, No. 4, 2011, pp. 697–709, available at http://tcs.sagepub.com.proxy.library.adelaide.edu.au/content/19/4/39, accessed 2 January 2013.

21. Jayasuriya, K., 'Comprehensive Security, the Post Cold War and the Transformation of the State', in Hari Singh and Colin Durkop (eds), *Comprehensive Security in the Asia-Pacific Region*, Germany: Konrad Adenauer Stiftung, 2009, p. 25, available at http://www.kas.de/wf/doc/kas_23030-1522-1-30.pdf?110803120516, accessed 23 May 2013.

22. Petersen, 'Risk Analysis', p. 709.

23. United Nations (UN), *The United Nations Convention on the Law of the Sea (UNCLOS)*, New York: UN, 1983.

24. There is a long list of International Maritime Organization (IMO) Conventions and Protocols that address dumping and pollution, and safety and security, at sea, along with United Nations Environment Programme (UNEP) Conventions and Protocols on marine environmental protection.

25. Bateman, S., Ho, J. and Chan, J., 'Good Order at Sea', RSIS Policy Paper, 2009.

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27. Some states, for example, China and India, have displayed tendencies to interpret exclusive economic zones (EEZs) as quasi-territorial seas by seeking to restrict movements and operations consistent with UNCLOS-defined freedom of navigation.

28. Kaye, 'Indian Ocean Maritime Claims', pp. 122–24; Kraska, J., 'I.O. 2.0: Indian Ocean Security and the Law of the Sea', *Georgetown Journal of International Law*, Vol. 43, No. 2, 2012, pp. 488.

29. Kraska, 'I.O. 2.0', pp. 488–90; Bateman, S., 'China's New Maritime Regulations: Do They Accord with International Law?', RSIS Commentaries, No. 220/2012, 5 December 2012.

30. The US Department of Defense, *Freedom of Navigation (FON) Report for Fiscal Year (FY) 2013*, 6 March 2014, available at http://policy.defense. gov/Portals/11/Documents/gsa/cwmd/FY2013%20DOD%20Annual%20 FON%20Report.pdf, accessed 14 March 2014.

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33. IPCC, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis Summary for Policymakers*, 2013, p. SPM-3, available at http://www.climatechange2013.org/images/ uploads/WGIAR5-SPM_Approved27Sep2013.pdf, accessed 27 August 2013; Cordner, L. 'Progressing Maritime Security Cooperation in the Indian Ocean', *Naval War College Review*, Vol. 64, No. 4, 2011, pp. 69–72; Chellaney, B., 'Indian Ocean Maritime Security: Energy, Environmental and Climate Challenges', *Journal of the Indian Ocean Region*, Vol. 6, No. 2, 2010, pp. 155–68.

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35. IPCC, *Climate Change 2007*.

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Sustainability in the 21st Century, Report of the Australia India Institute Task Force on Indian Ocean Security, Canberra, 2013, pp. 50–59; Weimar, N., 'Sino-Indian Power Preponderance in Maritime Asia: A (Re-)source of Conflict in the Indian Ocean and South China Sea', *Global Change, Peace & Security*, Vol. 25, No. 1, 2013, pp. 5–26, available at http://dx.doi.org/10.10 80/14781158.2013.761192, accessed 2 July 2013.

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prime examples of conflicts primarily on land having significant maritime security aspects.

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