# THE BLUE ECONOMY IN AUSTRALIA

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# The Blue Economy in Australia

## Conceptualising the Blue Economy, its Relationship with Maritime Security, and its Role in Australian Oceans Governance

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# The Blue Economy in Australia

## Conceptualising the Blue Economy, its Relationship with Maritime Security, and its Role in Australian Oceans Governance

Report by the Australian National Centre for Ocean Resources and Security (Michelle Voyer, Genevieve Quirk, Alistair McIlgorm, Kamal Azmi, and Stuart Kaye) for the Sea Power Centre - Australia

The **Australian National Centre for Ocean Resources and Security (ANCORS)**, University of Wollongong, is Australia's only multidisciplinary university-based centre dedicated to research, education and training on ocean law, maritime security and natural marine resource management. ANCORS provides policy development advice and other support services to government agencies in Australia and the wider Asia-Pacific region, as well as to regional and international organisations and ocean-related industry.

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# Foreword

The world's oceans are fundamental inputs to the global economy. With approximately 80 per cent of global trade by volume and more than 70 per cent by value carried by sea, oceans are the arteries of globalisation. As well as being essential to industries as diverse as tourism and the natural gas and petroleum sectors, the world's oceans are critical to food security, providing nearly 20 per cent of all protein consumed globally. Oceans are also cradles of innovation, spurring the development of new forms of renewable energy and experimental industries like deep-sea mining.

The integral role that the oceans play in connecting, feeding, and powering the world is easily appreciated. But ensuring that oceans are able to continue playing these crucial functions is much more complex. How do nations manage the growing environmental pressures on oceans and the competing priorities among diverse industries and communities? How can international legal regimes be strengthened to safeguard the economic potential of the high seas? And as more nations look to the oceans for economic, food, and energy security, how do countries peacefully share the world's oceans to mutual benefit?

The concept of the Blue Economy is a direct response to these and similar challenges. It seeks to sustainably manage the wide range of economic activity in the world's oceans. The report that follows explores the global evolution and contested interpretations of this Blue Economy concept, as well as its relationship with maritime economics and technological innovation. Due consideration is also given to the role of navies and naval shipbuilding in protecting and developing the Blue Economy.

Whether landlocked or archipelagic, all countries depend to some extent on the transportation connections and food and energy sources provided by the world's oceans. As with the rules-based global order, the sustainable management of the world's oceans is therefore in the interest of all states. This in turn means that every nation has a stake in refining and implementing the Blue Economy concept.

Commissioned by the Sea Power Centre - Australia for the Sea Power Conference 2017, the report that follows offers timely analysis of the Blue Economy in Australia and around the globe. I commend it to you.

**CAPT Michael McArthur RAN**
Sea Power Centre - Australia
19 September 2017

# Abbreviations

| | |
|---|---|
| ADF | Australian Defence Force |
| AIMS | Australian Institute of Marine Science |
| ANCORS | Australian National Centre for Ocean Resources and Security |
| DWP | Defence White Paper |
| DFAT | Department of Foreign Affairs and Trade |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| EIU | Economist Intelligence Unit |
| EC | European Commission |
| EU | European Union |
| FAO | Food and Agriculture Organisation |
| IUU | Illegal, Unreported and Unregulated |
| MPAs | Marine Protected Areas |
| NGOs | Non-Government Organisations |
| OECD | Organisation for Economic Co-operation and Development |
| SDGs | Sustainable Development Goals |
| SIDS | Small Island Developing States |
| SSF | Small-Scale Fisheries |
| UN | United Nations |
| UOW | University of Wollongong |
| WOC | World Ocean Council |
| WWF | World Wildlife Fund |

# Executive Summary

The Blue Economy is emerging as a popular 'buzzword' in modern marine and ocean governance. It is a term that is frequently used in a range of contexts, often in competing ways. Three forms of analysis of international and Australian Blue Economy policy documents, reports, conference papers and other key literature were conducted to provide clarity to the term 'Blue Economy'. The first examined the way the term was used in relation to other key concepts or ideas within oceans governance. A cluster analysis of key components of the 'Blue Economy', or themes identified within the Blue Economy literature, revealed four dominant lenses through which the Blue Economy is interpreted, which builds upon, and is supported by, earlier analysis conducted by Jennifer J. Silver et al.[1] These lenses were:

1. *Oceans as natural capital*: This lens focuses on environmental protection and restoration, natural capital, and community health and wellbeing, and is largely favoured by environmental Non-Government Organisations (NGOs).
2. *Oceans as livelihoods*: This lens focuses on food security and poverty alleviation, and is largely favoured by Small Island Developing States (SIDS) and development organisations.
3. *Oceans as good business*: This lens focuses on economic growth, Marine Spatial Planning, and strategies for growth in sustainable resource use, and is largely favoured by large and emerging global economies, such as the European Union (EU) and China, as well as the private sector.
4. *Oceans as drivers of innovation*: This lens focuses on research and development, investment, and monitoring, and is largely favoured by Government and industry groups.

The second form of analysis looked at the inclusion or exclusion of particular marine industries within the Blue Economy framework, according to the different interpretations of the term. Finally, analysis was conducted of existing Blue Economy activities and programs to identify the practical manifestations of the Blue Economy.

The following table summarises the results of this study:

| | **Oceans as natural capital** | **Oceans as livelihoods** | **Oceans as good business** | **Oceans as a driver of innovation** |
|---|---|---|---|---|
| **Primary objectives** | Ecosystem protection and/ or restoration | Poverty alleviation and food security | Economic growth and employment | Technological or technical advances |
| **Actors** | Conservation agencies/NGOs | Development agencies, SIDS, Small-Scale Fisheries (SSF) | Industry, larger global economies (EU, Organisation for Economic Co-operation and Development (OECD), China, etc.) | Academic institutes, industry, and Government |
| **Sectors** | Carbon intensive industries (e.g., oil and gas) excluded. Focus on economic benefits from conservation (e.g., eco-tourism and Marine Protected Areas (MPAs), Payment for Ecosystem Services, Blue Carbon, etc.) | Primary focus on SSF/eco-tourism with aspirations for diversification, especially aquaculture | All sectors included but primary focus on large multi-national corporations and sectors (e.g., shipping, oil and gas, renewables, etc.) | All sectors but particularly emerging industries like renewables, biotechnology, and deep sea mining |
| **Scale** | Small scale, locally based | Small scale, locally based | Global/regional and national | Sub-national districts or provinces |
| **Tools** | MPAs, Ecosystem Based Management | Community managed fisheries/MPAs, Marine Spatial Planning, Ecosystem Based Management | Marine Spatial Planning, economic valuation studies, targeted investment and growth strategies | Innovation hubs/research institutes, innovation 'challenges' or competitions, investment/ financing strategies |

*Table 1: Summary of the key findings of the conceptual analysis of the Blue Economy*

Across all four interpretations of the Blue Economy, maritime security is considered to play a central role in growing, developing and safeguarding the Blue Economy. Maritime security was seen to interact with the Blue Economy in two key ways:

- As an enabler of the Blue Economy: For example, through safeguarding navigation channels, providing important oceanographic data to marine industries, and controlling Illegal, Unreported and Unregulated (IUU) fisheries.
- As a sector within the Blue Economy: For example, by stimulating economic activity through shipbuilding, development of surveillance technologies and Defence activities.

In the Australian context, the primary lenses used to interpret the Blue Economy appear to be the 'oceans as a driver of innovation' lens, and, to a lesser extent, the 'oceans as good business' lens. In both these cases, however, the application of the concept was seen to be less developed in Australia than internationally. In particular, the central role given to Marine Spatial Planning as a governance tool to develop and support Blue Growth seen in many countries, and in particular in European countries, has not translated to Australia to date. Similarly, the focus on the development of innovation hubs and maritime clusters often associated with the 'oceans as a driver of innovation' lens has not been replicated in Australia at this stage. To date, the private sector has played a limited role in the Blue Economy discourse in Australia.

Consideration of each of the four identified lenses allows for greater understanding of the challenges and opportunities for the Blue Economy in Australia. One of the most significant challenges lies in reconciling the competing discourses contained within the different interpretations of the concept. Despite this, it may be possible for Australian Blue Economy projects to benefit from a wider and strategic engagement across the four lenses. The following table contains some discussion points around the applicability of the four Blue economy lenses in different Australian contexts.

| | Oceans as natural capital | Oceans as livelihoods | Oceans as good business | Oceans as a driver of innovation |
|---|---|---|---|---|
| **Area** | Communities surrounding existing MPAs, degraded environmental areas requiring restoration | Northern Australia, Indigenous communities, fishing communities around Australia, etc. | East Coast of Australia, Southern Australia | East Coast of Australia, Southwestern Australia |
| **Scale/actors** | Small and medium enterprises | Small and medium enterprises | Larger-scale business and corporations, public sector (e.g., Department of Defence) | Academic institutes, industry, and Government |
| **Sectors/ activities** | Eco-tourism, Payment for Ecosystem Services, Blue Carbon, environmental offsets, etc. | Focus on fisheries and aquaculture; development of improved supply chains, value added seafood processing, and local markets for seafood products and associated tourism opportunities; specialist niche industries such as small boat building, marine education, monitoring, and surveillance activities, etc. | Maritime clusters around significant sectors (e.g., shipbuilding, ports, maritime security, etc.) supported by centres of research and development and associated tourism activities (e.g., 'industrial' tourism); business incubators | Development of maritime innovation hubs and business incubators embracing all sectors but particularly emerging industries like renewables, offshore aquaculture, biotechnology, and deep sea mining |

*Table 2: Discussion points: Applying the Blue Economy lenses to Australia*

The Blue Economy coalesces two emerging yet competing discourses around the ocean. Previously considered an inexhaustible, untamed wilderness, the oceans are now increasingly seen as threatened places, at risk from pollution, habitat loss, overfishing, and climate change. At the same time, nations around the word are turning their attention to the oceans as a new source of economic development and growth, and seeing the oceans as 'industrialised' spaces, with growing emphasis on demarcation of national jurisdictions and the activities that occur within and beyond these jurisdictions. The Blue Economy seeks to address both these narratives by bringing together ocean-based development with environmental stewardship and protection. In this context, the Blue Economy can be seen as providing a unique opportunity for harnessing new growth, improved wellbeing, and more sustainable use of our oceans. Yet as ocean spaces become increasingly crowded with often competing uses across jurisdictional boundaries that are contested or poorly defined, the Blue Economy may drive conflict and disputes. For this reason, the Blue Economy and maritime security are mutually inclusive and interdependent concepts – each depends on and supports the other. Understanding the different ways the Blue Economy is conceived of and understood helps to identify areas of potential conflict, as well as areas on which consensus based approaches might be built. More detailed examination of the interlinkages between maritime security and the Blue Economy is required, alongside the development of strategic policies that advance both. In the Australian context, these efforts may include:

- more explicit consideration of maritime security in ocean economy valuation processes;
- active engagement of Department of Defence and security personnel in Blue Economy planning processes;
- development of Marine Spatial Planning exercises and industry development strategies that provide pathways through which conflict resolution can be negotiated and facilitated; and
- development of support mechanisms that encourage innovation and growth of environmentally sensitive marine industries, which may include new and emerging business opportunities in the maritime security sector.

# Introduction

The concept of a Blue Economy has emerged over recent years in response to the 2012 United Nations Conference on Sustainable Development or Rio 20+. The concept has its roots in the earlier 1992 Rio Earth Summit, which focused on fostering the growth of a 'Green Economy' – an economy 'that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'.[2] In response to an international push to 'green' the global economy, SIDS began emphasising the importance of the ocean and marine economy, promoting the concept of a Blue Economy.[3] Since that time there has been increasing interest in the Blue Economy around the world, yet the term is still employed differently in different contexts, and there is no universally accepted definition of the Blue Economy.[4] This report aims to synthesise and collate the existing knowledge about the Blue Economy. It also aims to contribute to the conceptual understanding of the term and its practical implications. Finally, it seeks to explore the potential role of the Blue Economy in the use and management of Australia's maritime jurisdictions, with a particular focus on the role of maritime security in supporting and enabling the development of an Australian Blue Economy.

The report is broken up into four main parts:

- Part 1 will attempt to break down the conceptual complexity of the term ' Blue Economy' through the use of three different analytical approaches (content analysis of Blue Economy literature, an examination of the sectors considered to make up the Blue Economy, and a review of existing Blue Economy activities).
- Part 2 will examine the role of maritime security in the Blue Economy.
- Part 3 will explore the ways in which the Blue Economy has been interpreted and applied to date in the Australian context.
- Part 4 will outline some recommendations for growing and developing the Blue Economy in Australia and the maritime security sector.

# Part I: What is the Blue Economy?

Perhaps the one universally agreed aspect of the Blue Economy is that it is a fluid concept, employed differently in different contexts and by different actors.[5] Since its emergence at the Rio 20+ Earth Summit in 2012, many scholars and marine policy actors have identified the lack of a clear definition of the Blue Economy as potentially problematic, and some have sought to impose their own definition on the term.[6] Others have acknowledged the inherent ambiguity of the term and focused on developing frameworks to assist in understanding and 'operationalising' the Blue Economy.[7] One of the earliest attempts to explore the competing discourses around the Blue Economy was conducted by Silver et al.[8] They analysed the way the term was employed as part of the Earth Summit proceedings, and identified four dominant discourses:

- *Oceans as natural capital*: Predominately employed by environmental NGOs, which used the term to argue that ecosystem services provided by marine environments should be better recognised and accounted for.
- *Oceans as good business*: Promoted by marine sectors such as fisheries and shipping, as well as development agencies. This discourse called for greater recognition of the ocean-based industries and the contribution they make to society.
- *Oceans as integral to Pacific SIDS*: Promoted by Pacific SIDS, who were actively engaged in framing the Blue Economy around their livelihoods and development objectives.
- *Oceans as SSF livelihoods*: Largely promoted by SSF organisations and advocates, including development organisations and SIDS. This discourse focused on poverty reduction and the role of SSF in providing a source of protein and livelihood for the world's poor.[9]

The vastly different interpretations of the Blue Economy demonstrated in the Silver et al. study suggest that an agreed definition is unlikely to provide a guide for understanding the concept.[10] In fact, consensus over a universal definition may be unlikely given the inherent conflicts that exist between the different ways the term is understood. Ambiguity is not, however, unusual within policy settings. Terms such as the Blue Economy can be understood to be 'buzzwords'.[11] These are terms which 'represent a general agreement in the abstract, but they generate endless (and irresolvable) disagreements about what they might mean in practice'.[12] It is difficult to find consensus on the precise definition of such buzzwords because different actors will favour particular interpretations that meet their own purposes. While this can be problematic it can also 'allow actors to coordinate their action and proceed in joint activities while simultaneously disagreeing over local meanings'.[13] As an alternative to a definition, Christian Bueger sought to provide clarity around the term 'maritime security' by examining the different meanings ascribed to the term in relation to other concepts and ideas.[14] He also examined the context and political claims associated with the term, as well as security activities in practice. A similar approach has been applied in this report to better understand the Blue Economy. The following sections will examine three important facets of the Blue Economy:

- a conceptual understanding of the Blue Economy using a content analysis of key Blue Economy policy and planning documents;
- a sectoral understanding of the Blue Economy by examination of the processes of inclusion and exclusion of different sectors; and
- an examination of how the Blue Economy idea is applied in practice.

This analysis was primarily conducted through a review of the available literature around the Blue Economy. This literature largely took the form of policy documents, conference proceedings, position papers, and reports. This grey literature was obtained through three primary means:

- a general web search using the term 'Blue Economy';
- a targeted web search of known agencies, organisations and NGOs engaged in Blue Economy activities (e.g., the EU, OECD, etc.); and
- a targeted search via key Government and academic contacts working in the field of the Blue Economy.

A list of the key documents, organised into regions, is contained in Table 3. It is acknowledged that there are likely to be gaps in this list, given the difficulties associated with obtaining grey literature, which is often not publicly available or readily accessible. In total, 35 documents were included in the analysis.

| Region | Key Documents |
|---|---|
| Global | • A Blueprint for Ocean and Coastal Sustainability<br>• Green Economy in a Blue World<br>• Indispensable Ocean: Aligning Ocean Health and Human Wellbeing<br>• Blue Economy Concept Paper<br>• Global Blue Growth Initiative and Small Island Developing States (SIDS)<br>• The Oceans Economy: Opportunities and Challenges for Small Island Developing States<br>• Chair's Summary: Global Oceans Action Summit for Food Security and Blue Growth<br>• Principles for a Sustainable Blue Economy<br>• The Blue Economy: Growth, opportunity and a sustainable ocean economy<br>• The Ocean Economy in 2030<br>• Abu Dhabi 2016 Blue Economy Declaration<br>• The Potential of the Blue Economy: Increasing Long-Term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries<br>• Ocean Prosperity Roadmap: Fisheries and Beyond |
| Europe | • Blue Growth: Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts<br>• Blue Growth: Opportunities for marine and maritime sustainable growth<br>• Progress of the EU's Integrated Maritime Policy<br>• Innovation in the Blue Economy: realising the potential of our seas and oceans for jobs and growth<br>• New Blue Deal: Good jobs for coastal communities through healthy seas |

| | |
|---|---|
| Small Island States (Indian and Pacific oceans) | • A roadmap to a sustainable Indian Ocean blue economy<br>• Prospects of Blue Economy in the Indian Ocean<br>• The "Blue Economy": A Pacific Small Island Developing States Perspective<br>• Goa Declaration<br>• The Blue Economy and Small States<br>• Financing the Blue Economy in Small States<br>• The Blue Economy: Concept, Constituents and Development |
| Asia | • Nurturing Sustainable and Inclusive Coastal and Ocean-based Blue Economy in Tropical Coasts<br>• Asia and the Pacific's Blue Growth Initiative<br>• Blue Economy for Business in East Asia: Towards an Integrated Understanding of Blue Economy<br>• Blue Growth<br>• Vision for Maritime Cooperation under the Belt and Road Initiative |
| Americas | • Developing the Blue Economy of Florida's Gulf Coast: A strategic roadmap for innovation and growth in the marine sciences cluster<br>• The Ocean Enterprise: A study of US business activity in ocean measurement, observation and forecasting<br>• Toward A Blue Economy: A Promise for Sustainable Growth in the Caribbean: An Overview |
| Australia | • National Marine Science Plan 2015-2025: Driving the development of Australia's blue economy<br>• Innovation for the Blue Economy: Workshop Summary |

*Table 3: Key Blue Economy documents by region*[15]

# A conceptual understanding of the Blue Economy

A content analysis of key ideas and themes contained within Blue Economy documents was developed, which involved two key stages. The full details of the content analysis methodology and results are contained in the Appendix. The first stage of the content analysis involved coding the documents to uncover dominant themes or ideas. This was supported by consideration of existing academic literature relating to the definition of the Blue Economy.[16] The analysis identified five overarching themes or components of the Blue Economy, with a range of related sub-themes (Table 4).

| | **Components of the Blue Economy** | | | | |
|---|---|---|---|---|---|
| | **Economic growth and development** | **Environmental sustainability** | **Social considerations** | **Governance and institutional mechanisms** | **Technical capacity** |
| **Sub-themes** | Blue Growth<br>Resource utilisation/ sectors/growth strategies<br>Employment<br>Livelihoods<br>Maritime clusters<br>Income diversification | Impact management<br>Climate change mitigation<br>Ecosystem protection<br>Ecosystem restoration<br>Ecosystem services | Food security<br>Equity<br>Inclusiveness<br>Poverty alleviation<br>Wellbeing<br>Community engagement<br>Capacity development | Coordination/ integration<br>Links with Sustainable Development Goals (SDGs) and other conventions<br>Marine Spatial Planning<br>Ecosystem Based Management<br>MPAs | Innovation<br>Maritime security<br>Investment and financing<br>Research and Development<br>Private sector engagement |

*Table 4: Key themes and sub-themes within Blue Economy grey literature*

The second component of the analysis focused on the different ways a concept was employed in relation to other concepts and ideas.[17] This included examination of the similarities and differences between sub-themes identified in the previous stage. A cluster analysis that explored the co-occurrence of key sub-themes was conducted, which was then compared with the discourses identified by Silver et al.[18] The results of this analysis identified four main clusters, or lenses. Three of these lenses aligned with the Silver et al. analysis, while an additional lens around Innovation and Research was also identified:

1. *Oceans as natural capital*: This lens focused on environmental protection and restoration and community health and wellbeing, and was largely favoured by environmental NGOs.

2. *Oceans as livelihoods*: This lens focused on food security and poverty alleviation, and was largely favoured by SIDS and development organisations.
3. *Oceans as good business*: This lens focused on strategies for growth in sustainable resource use and was largely favoured by large and emerging global economies, such as the EU and China, and the private sector.
4. *Oceans as drivers of innovation*: This lens focused on research and development and investment and innovative financing, and was largely favoured by Government and industry groups.[19]

Although sub-themes found in all four lenses may have existed within a single policy document, each document tended to prioritise or privilege one or two of the identified lenses. Figure 1 contains a matrix highlighting the four clusters, or lenses, and how related concepts and ideas interacted with these lenses.

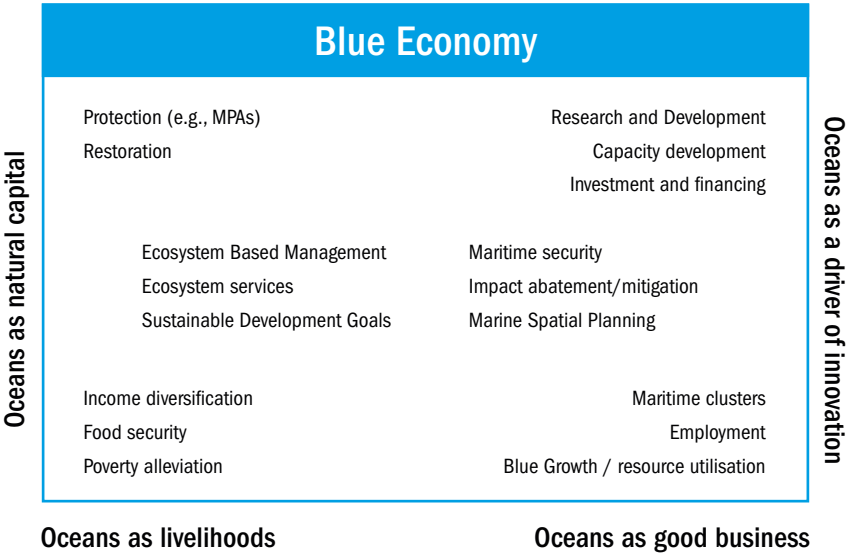


*Figure 1: A Blue Economy matrix illustrating related terms and concepts*

## Lens 1: Oceans as Natural Capital

Although environmental protection and sustainability are fundamental to most definitions of the Blue Economy, the content analysis suggests that these objectives are prioritised and conceived of differently by different actors. The 'oceans as natural capital' lens places particular emphasis on this theme and supports the discourse of the same name identified by Silver et al.[20] Consistent with their analysis, this is a lens privileged by conservation NGOs, such as the World Wildlife Fund (WWF), which defines the Blue Economy as a marine based economy that:

> Provides social and economic benefits for current and future generations, by contributing to food security, poverty eradication, livelihoods, income, employment, health, safety, equity, and political stability.
>
> Restores, protects and maintains the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems – the natural capital upon which its prosperity depends.
>
> Is based on clean technologies, renewable energy, and circular material flows to secure economic and social stability over time, while keeping within the limits of one planet.[21]

A primary tool aligned with this notion of the Blue Economy is identifying and measuring – preferably through economic valuation – the full range of ecosystem services provided by the oceans.[22] It prioritises Ecosystem Based Management and MPAs as central tools in the development of a Blue Economy by highlighting the added value that can be derived – often in economic terms – through adequate protection of this natural capital. There are close links between this lens and the 'oceans as livelihoods' lens, with both tending to focus on small-scale, community based social enterprise and alternative livelihood development opportunities through improved fisheries management, eco-tourism opportunities, and emerging aquaculture developments.[23]

The concept of Ecosystem Based Management is particularly embraced within the 'oceans as natural capital' and 'oceans as livelihoods' interpretations. As with the Blue Economy, Ecosystem Based Management is an inherently ambiguous concept, often interpreted in different ways and often according to the degree to which environmental objectives are prioritised.[24] It is found throughout the Blue Economy literature in different contexts, but within these lenses Ecosystem Based Management is seen as a key tool in delivering biodiversity conservation.

### Lens 2: Oceans as Livelihoods

The notion of the Blue Economy as a development model central to the livelihoods of coastal communities is aligned with the Silver et al. themes of 'Oceans as Integral to Pacific SIDS' and 'Oceans as Small-Scale Fisheries Livelihoods'.[25] It places human wellbeing and livelihood as a central objective of the Blue Economy, with heavy emphasis on the goal of poverty alleviation. It is of little surprise that this is an interpretation of the Blue Economy most commonly favoured by developing nations and development organisations. For example, the United Nations (UN) has recognised the potential of the Blue Economy as a development model, which it defines as the:

> Improvement of human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. At its core the ocean economy refers to the decoupling of socio-economic development from environmental degradation.[26]

The Blue Economy in this context provides developing countries (particularly SIDS) with a framework through which they can diversify their economic base into alternative and emerging sectors, and increase their resilience to external shocks. Given that many SIDS have significantly greater maritime jurisdiction than land mass, there is logic in looking to the oceans to provide new income streams. SIDS in the Indian and Pacific oceans and the Caribbean have therefore been at the forefront of this interpretation of the Blue Economy.[27]

The Blue Economy is also seen as a means through which the contributions of SSF and other smaller scale economic sectors can be accounted for and considered. To this end, the link between global food security and the Blue Economy is especially championed by organisations such as the Food and Agriculture Organisation (FAO).[28]

A more recent trend in the literature on the Blue Economy from development organisations is the emphasis on clear links between the Blue Economy and the UN SDGs.[29] These non-binding instruments have been developed to provide an international governance strategy primarily driven through goal setting.[30] Goal 14, 'Life Below Water', specifically addresses issues of relevance to the Blue Economy. Yet the Blue Economy may also play an important role in addressing other SDGs, including goals relating to poverty alleviation, food security, affordable and clean energy, and climate action.[31]

### Lens 3: Oceans as Good Business

The 'oceans as good business' lens supports the similar theme identified by Silver et al. and is particularly prevalent in literature from larger economies and organisations that represent those states, including the EU, OECD, and industry and business groups.[32] For example, industry groups such as the World Ocean Council (WOC) and

corporate consultancies like the Economist Intelligence Unit (EIU) favour a growth-centric interpretation of the Blue Economy. According to the EIU: 'A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy'.[33]

The primary focus of this interpretation appears to be securing economic growth from the oceans in a manner that is sensitive to environmental constraints. Many of the documents relevant to this theme therefore primarily focus on quantifying the benefits provided by existing marine sectors and developing projections and strategies for future growth. For example, the OECD report 'The Ocean Economy in 2030' identifies ocean industries as a key driver of global economic growth over the next decade:

> Looking to 2030, many ocean-based industries have the potential to outperform the growth of the global economy as a whole, both in terms of value added and employment. The projections suggest that between 2010 and 2030 on a "business-as-usual" scenario basis, the ocean economy could more than double its contribution to global value added, reaching over USD 3 trillion. … Ocean industries also have the potential to make an important contribution to employment growth. In 2030, they are anticipated to employ approximately 40 million full-time equivalent jobs in the business-as-usual scenario. The fastest growth in jobs is expected to occur in offshore wind energy, marine aquaculture, fish processing and port activities.[34]

Marine Spatial Planning is championed as a key tool to deliver a Blue Economy in this lens, as are specific investments and growth strategies in individual sectors. Special attention is given to emerging sectors, such as aquaculture, ocean-based renewables, deep sea mining, and marine biotechnology.[35]

### Lens 4: Oceans as a Driver of Innovation

A primary focus of the Blue Economy is developing new ways of using the ocean by changing our approach to 'old' industries like fisheries or by coming up with entirely new uses for the ocean, such as marine biotechnology, ocean-based renewables, and deep sea mining. Hence innovation is central to many of the interpretations of the Blue Economy. This lens also intersects with the original, non-marine conception of the Blue Economy, as put forward by Gunter Pauli, which champions 'blue sky' thinking and innovation.[36] The 'oceans as good business' and 'oceans as a driver of innovation' lenses are closely related, as innovation, investment and public/private sector partnerships are seen as key drivers of the success of 'Blue Growth' strategies.

For example, research and development is seen as central to the European vision of Blue Growth:

> New sources of growth are triggered by continuous innovation. At the same time innovation activates labour productivity improvements which have a direct impact on economic growth. Hence research, development and innovation are at the heart of any Blue Growth strategic framework.[37]

The innovative approaches championed within the literature are diverse. Some are technical or technological advances that will allow for more efficient, cost-effective, and environmentally sensitive resource use. Others relate to management, in particular to innovative financing mechanisms that engage the private sector and secure long-term investment in emerging industries.[38]

## A sectoral understanding of the Blue Economy

An alternative approach to understanding the Blue Economy is considering its constituent parts – the different sectors that are considered to 'make up' the Blue Economy. This 'taxonomic' approach is guided and informed by a larger body of work aimed at quantifying the contribution of ocean and marine industries to global, national, and regional economies. This process can be understood as a step-by-step program that aims to build a picture of the value of the ocean economy, which can then be used to inform Blue Economy development.[39] These steps can be understood to broadly follow a similar pattern, as follows:

1. define the ocean economy;
2. identify agreed segments of the ocean economy;
3. identify data availability and measurement issues (such as national accounts data and issues relating to the different ways this data is collected across different jurisdictions);
4. use data to measure current values and monitor trends, including the identification of growth strategies; and
5. use data to identify and address externalities and other policy issues that inhibit or support 'Blue Growth'.

A reasonable degree of consensus has emerged in relation to the first of these steps. The 'ocean economy' is a less contested term than the Blue Economy, and is described as 'that portion of the economy which relies on the ocean as an input to the production process or which, by virtue of geographic location, takes place on or under the ocean'.[40] The ocean economy (also sometimes referred to as the marine economy) is distinct from but part of the coastal economy, which incorporates all economic activity that occurs on or near the coast.[41] Figure 2 demonstrates the relationship between the coastal and ocean economies.

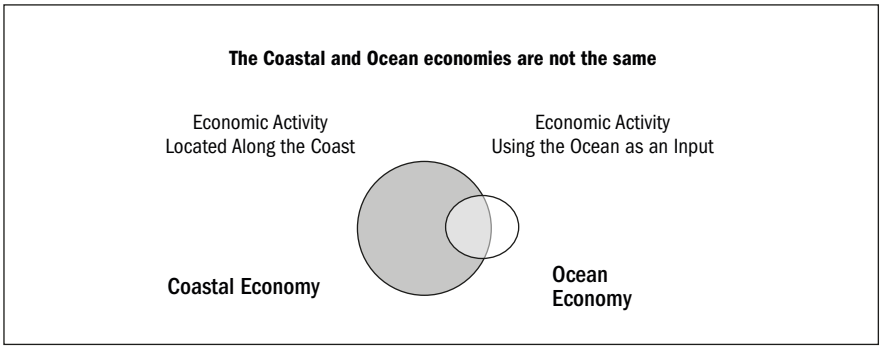


*Figure 2: Comparing the ocean and coastal economies*[42]

Although the Blue Economy is generally considered to be a subset of the ocean economy, the interaction between the Ocean and Blue economies is less well established.[43] Identification of the segments or sectors that make up the ocean economy is well advanced. A diverse array of 'taxonomies' of the ocean economy, such as the one outlined in Table 5, have been developed to assist data collection.[44] There have also been considerable efforts around the world to develop robust and consistent approaches to valuation of the ocean economy, largely using national accounts data.[45] In particular, China and other countries within the Partnerships for the Sustainable Management of the Seas of East Asia coalition have been actively working on developing a common system of economic valuation based around national income accounts.[46]

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

*Table 5: Sectors that contribute to the ocean economy*[47]

The picture gets confused, however, when efforts are made to distinguish which segments of the ocean economy should also be included within the Blue Economy. In this regard, the lens through which the Blue Economy is interpreted appears to play a significant role. An important illustration of the different ways in which the Blue Economy is understood by different actors can be seen in the debates about which sectors should and should not be included under the umbrella term of the Blue Economy. Although these debates are yet to fully play out in public discourse, they are regular features of Blue Economy fora and informal discussions. There are some hidden 'clues' on the level of acceptance of the full suite of ocean industries under the Blue Economy umbrella in the different definitions adopted by different actors. For example, the definitions favoured by industry and the larger global economies tend to be broad enough to embrace all ocean-based economic activities. In particular, the 'oceans as good business' lens often uses the terms 'Blue Economy' and 'ocean economy' interchangeably with little distinction drawn between the two terms. In some cases, efforts to develop a Blue Economy begin and end with strategies designed to grow ocean-based industries. Valuation studies are seen primarily as a tool via

which robust long-term monitoring programs can be developed to provide an indicator by which advocates can demonstrate the social and economic importance of ocean industries.[48] The 'oceans as a driver of innovation' lens takes a similar approach but tends to focus most on new and emerging industries, such as marine biotechnology, deep sea mining, and renewables.

By way of contrast, the 'oceans as natural capital' and 'oceans as livelihoods' lenses place non-market uses, especially human welfare and the protection and restoration of marine ecosystems, at the heart of their definitions of the Blue Economy. These lenses tend to emphasise more traditional and established sectors, especially food producing sectors, such as fisheries and aquaculture. While these lenses still consider valuation studies to play a central role in developing a Blue Economy, valuation of non-market uses and ecosystem services is considered to be as important as valuing market uses. Both sets of data are considered essential to informing Marine Spatial Planning exercises, as well as Government and industry investment, planning and protection strategies.[49] These lenses are also less accommodating towards the full range of sectors within the ocean economy. For example, with its emphasis on clean technologies, renewable energy and circular flow materials, the WWF definition places a clear delimitation on what sectors it considers to be part of the Blue Economy. Although not explicitly excluded, fossil fuel-dependent, carbon-intensive industries, such as the oil and gas sector, are unlikely to meet the WWF definition of a Blue Economy.[50]

# A practical understanding of the Blue Economy

One of the most instructive ways to understand vague concepts, such as the Blue Economy, is to study the way they are applied. To date, the infancy of the Blue Economy concept means there are limited practical examples of its application. However, such practical examples can be considered in light of the four lenses identified in the content analysis.

## Lens 1: Oceans as Natural Capital

Among conservation NGOs, the Blue Economy has provided a useful conceptual framework through which economic and development objectives can be tied to environmental considerations. Increasingly, conservation organisations have expanded the focus of their activities to incorporate consideration of livelihoods, wellbeing, and poverty reduction, as well as conservation objectives. This recognises the complexities of socio-ecological systems and the moral and practical desirability of achieving 'win-win' results for both the environment and communities.[51] In practice, this shift in focus has led to a greater consideration of the socio-economic implications

of conservation, demonstrated by a trend towards community based approaches. The adoption of terms such as the Blue Economy allows conservation actors to clearly articulate the broader suite of objectives they seek to achieve through their activities, and speak to a broader range of stakeholders and potential collaborators beyond their traditional audiences.

The trend towards 'coupling' conservation objectives with positive socio-economic outcomes for communities has occurred in parallel with an increased emphasis on valuation of ecosystem services. The practice of quantifying the value of the natural capital provided by the oceans is seen by many as a key tool in ensuring the importance of natural systems is recognised and accounted for within the Blue Economy framework.[52] In particular, the valuation of ecosystem services is considered to be fundamental to providing a counterpoint for ocean economy valuations already common within the Blue Economy literature. Under this model, both use and non-use values are quantified in economic terms, providing a means of more accurately accounting for the true cost of externalities and a common language to assist in informing management actions, including spatial planning and trade-off decision-making.[53] It also provides an important tool to drive conservation through, for example, payment for ecosystem services such as carbon sequestration or Blue Carbon.[54] The implementation of payment-for-ecosystem-services models is progressing in various locations around the world, primarily as an environmental offset tool, and is seen as a sector within the wider Blue Economy framework.

### Lens 2: Oceans as Livelihoods

The application of the Blue Economy model in developing states is context specific. In some SIDS, the focus of the Blue Economy has primarily related to encouraging improvements in management of and community returns from existing economic sectors, especially fisheries. For example, a review of the implementation of Blue Economy projects in the Pacific Ocean by Keen et al. found that they tended to concentrate on traditional sectors, such as developing improved value chains for fisheries production.[55] These programs emphasised improved community engagement and ecosystem-based approaches, but were found to have limited impact on the way economic revenue is generated and distributed. Institutional arrangements were also considered rudimentary. The strength of the Blue Economy concept in this setting was seen to be as a tool that could more effectively link existing environmental management approaches to the SIDS setting through, for example, greater recognition of customary tenure and cultural context.[56]

In Grenada, in the Caribbean Islands, efforts to grow the Blue Economy have included the development of a research institute, a policy framework incorporating Marine Spatial Planning, and specific project-based actions, particularly in the important

economic sectors of fisheries and marine tourism.[57] The Blue Growth strategy of the FAO is linked closely with ensuring long-term food security through support for SSF and the development of sustainable aquaculture operations.[58]

In other settings, the implementation of a Blue Economy has focused primarily on diversification and the identification of new sources of growth for developing states. Seychelles has been particularly active in promoting the development of a Blue Economy through the establishment of a range of governance, research, and development mechanisms focusing on diversification, environmental sustainability, the provision of high-value jobs, and food security.[59]

### Lens 3: Oceans as Good Business

The 'Blue Growth' strategy developed by the European Commission (EC) is perhaps the most well-known and well-established application of the Blue Economy concept. The EC's plans are consistent with those of larger economies in that they single out key marine sectors, such as aquaculture, deep sea mining, biotechnology, and ocean based renewables, for the development of specific 'Blue Growth' strategies. These strategies usually involve the development of governance and financing arrangements to secure growth.

Marine Spatial Planning plays an important role in the EC approach to Blue Growth.[60] Recent reviews of the European processes for Marine Spatial Planning have indicated a primary focus on achieving sectoral and Blue Growth objectives, with some critiques suggesting that this has been in conflict with, or at the expense of, concurrent efforts to improve ecosystem-based spatial planning outcomes, such as marine protected areas.[61] Marine Spatial Planning in this context aims to give certainty to businesses and investors, resolve resource and user conflict, and ensure a strategic approach to the development of ocean spaces. All maritime sectors are embraced under this model.

Other large economies, including China and India, have embraced the Blue Economy as a source of new economic growth. In China, Blue Economy development has been guided by the development and implementation of Marine Functional Zoning, which has aimed to rationalize governance arrangements, nurture sustainable industries, and secure sovereign rights.[62] China has demonstrated a significant growth agenda in relation to its maritime jurisdiction, perhaps best demonstrated through its massive 'Maritime Silk Road' project aimed at securing trade routes and opening up new economic opportunities in the Indo-Pacific region.[63] Their ocean-based economic agenda also highlights the risks associated with geopolitical and territorial disputes, which are likely to become increasingly common as countries around the world look to their oceans for future economic growth.[64]

A key tool employed within this lens is economic valuation in order to identify the worth of ocean-based industries to national, regional, and global economies. This technique has been particularly embraced in emerging economies in Southeast and East Asia, especially China.[65] This provides a metric to highlight and communicate the value of these sectors to society, governments and the business sector in order to grow investment and build social and political support.[66]

The private sector has also embraced the 'oceans as good business' lens. The WOC and the EIU have sought to encourage Blue Economy development through events such as the World Ocean Summit (hosted by the EIU) and the Sustainable Ocean Summit (hosted by the WOC). These events aim to foster greater engagement of the private sector in the sustainable development of the oceans, including by creating opportunities and incentives for innovation. Organisations such as the WOC are also leading discussions around the role of business in addressing the SDGs, including SDG 14.[67] This is likely to link in with broader engagement of the private sector in the SDG agenda through avenues such as the United Nations Global Compact. The Compact has established a range of resources to assist large-scale and multi-national companies to identify the SDGs relevant to their businesses and commit to actions that will assist global efforts to meet those goals.[68]

### Lens 4: Oceans as a Driver of Innovation

The significance of research and development to the continued growth of the Blue Economy has been recognised in many developed and developing states though the establishment of research institutes or networks. These institutes are designed to provide a supporting role for Blue Growth through partnerships with industry and the development of technological advances in resource use and management. Examples include the Ocean Enterprise in the United States, which aims to provide effective weather observation and forecasting to support ocean businesses.[69] In the Netherlands, the Maritime Research Institute Netherlands and Delft University of Technology provide academic research to support the maritime sector, particularly shipping. Incubators and accelerators for start-ups in the marine sector are being embraced around the world, with examples including the Buccaneer Delft offshore energy accelerator (Netherlands), the Scripps Venture Partners Program (United States), and the James Michel Foundation Blue Economy Incubator Programme (Seychelles).

The Blue Economy literature recognises that innovative management approaches are also required, alongside technical or technological advances. In particular, novel approaches to financing, such as debt swaps, blue bonds, and payments for ecosystem services are being actively pursued by a number of countries in order to secure the necessary funds required to kick-start investment in emerging industries.[70]

# Summary

The combination of content analysis, examination of the sectoral make-up of the Blue Economy, and an investigation of Blue Economy projects in practice identified and supported four main conceptualisations of the term, summarised in Table 6. These lenses have been used across different jurisdictions, scales, and actors, and demonstrate the malleable way in which the Blue Economy concept has been employed. It also supports earlier analysis by Silver et al., demonstrating that despite the rapid uptake of the concept since the 2012 Rio +20 conference, there has been little to no clarification of the term or resolution of the competing discourses.[71]

The 'oceans as natural capital' lens can largely be seen as the aggregation and re-configuring of a range of existing conservation management efforts, rather than a new approach to ocean conservation per se. This is perhaps the least widely employed variant of the Blue Economy term but has been adopted by environmental NGOs as part of a broader trend towards more socially responsible conservation and the encouragement of social enterprise.[72] This has occurred alongside the increasing commodification of nature through economic valuations and the growth of 'payment for ecosystem services' models. This lens is likely to be the most restrictive in terms of the acceptance of the full suite of ocean industries under the umbrella of the Blue Economy, with carbon intensive sectors such as oil and gas posing significant challenges to the definitions favoured under this lens.

| | Oceans as natural capital | Oceans as livelihoods | Oceans as good business | Oceans as a driver of innovation |
|---|---|---|---|---|
| **Primary objectives** | Ecosystem protection and/ or restoration | Poverty alleviation and food security | Economic growth and employment | Technological or technical advances |
| **Actors** | Conservation agencies/NGOs | Development agencies, SIDS, Small Scale Fisheries | Industry, larger global economies (EU, OECD, China, etc.) | Academic institutes, industry, and Government |
| **Sectors** | Carbon intensive industries (e.g. oil and gas) excluded. Focus on economic benefits from conservation (e.g., eco-tourism and MPAs, Payment for Ecosystem Services, Blue Carbon, etc.) | Primary focus on SSF/eco-tourism with aspirations for diversification, especially aquaculture | All sectors included but primary focus on large multi-national corporations and sectors (e.g., shipping, oil and gas, renewables, etc.) | All sectors but particularly emerging industries like renewables, biotechnology, and deep sea mining |
| **Scale** | Small-scale, locally based | Small-scale, locally based | Global/regional and national | Sub-national districts or provinces |
| **Tools** | MPAs, Ecosystem Based Management | Community managed fisheries/MPAs, Marine Spatial Planning, Ecosystem Based Management | Marine Spatial Planning, economic valuation studies, targeted investment and growth strategies | Innovation hubs/research institutes, innovation 'challenges' or competitions, investment/ financing strategies |

*Table 6: Summary of the key findings of the conceptual analysis of the Blue Economy*

The 'oceans as livelihoods' lens frames the Blue Economy as a tool that can assist in building social and economic resilience for vulnerable states in the face of climate change and natural and socio-economic 'shocks', such as natural disasters and economic downturns. In this context the importance of diversification is recognised, with the Blue Economy providing a mechanism through which to expand economic interests beyond traditional fisheries and tourism sectors.[73] The focus tends to concentrate on social enterprise or development of small-scale business opportunities that can eventually be scaled up to provide enhanced social and economic benefits. However, economies such as the Seychelles are also exploring opportunities that might be provided through larger scale investments in ocean renewables, deep sea mining, and oil and gas.[74] Despite this, in practice, Blue Economy projects in developing states have tended to concentrate on the traditional sectors of fishing and tourism. There has been less success in expanding into emerging industries, such as aquaculture, deep sea mining and renewables, often due to difficulties in accessing secure finance.[75]

The 'oceans as good business' lens is favoured by the private sector and the established and emerging world economies, including the EU, China, India, and other Asian countries. In most cases, the focus of their engagement with the concept of a Blue Economy relates primarily to large multi-national companies in the shipping, industrial fishing, oil and gas, and mining sectors, alongside strategies for valuing the contribution of these sectors to national and international economies. In part, the scale of these contributions highlights the importance of these sectors and their capacity to deliver greater growth. In this context, Marine Spatial Planning is seen as a key tool in delivering certainty to industry while balancing competing resource and conservation demands.

Finally, the 'oceans as a driver of innovation' lens is perhaps the most glamorous version of the multiple Blue Economy interpretations. This lens promotes the seemingly limitless potential of the oceans by imagining them as sources of new discoveries and new wealth. Within this interpretation, tapping into this wealth requires a nurturing technical and institutional environment, one that encourages risk taking and innovative thinking.

This report does not seek to promote any particular interpretation of the Blue Economy, but instead provides a useful tool through which current and future discussions and negotiations about the Blue Economy can be examined. Understanding the lens through which these discussions are occurring can assist in identifying potential areas of conflict and consensus. An explicit consideration of other lenses may also allow for wider consideration of the full potential of the Blue Economy and how a broader suite of objectives might be achieved.

# Part II: Maritime Security and the Blue Economy

The importance of maritime security is recognised across all four Blue Economy lenses. In fact, many maritime security forums have been key supporters of the Blue Economy concept, particularly in the Indian Ocean region where security partnerships across a range of maritime nations have focused on addressing threats to economic development from piracy and IUU fishing.[76] Maritime Security was seen in the literature to interact with the Blue Economy in two key ways:

1. As an enabler of the Blue Economy: For example, through safeguarding navigation channels, providing important oceanographic data to marine industries, and managing IUU fisheries.
2. As a sector within the Blue Economy: For example, by stimulating economic activity through shipbuilding, development of surveillance technologies, and defence activities.

## Maritime security as an enabler of the Blue Economy

Maritime security is considered essential to supporting the Blue Economy in a range of significant ways relevant to multiple sectors within the Blue Economy. Maintaining peace and security through peacekeeping operations, international diplomacy, and aid programs plays an important role in supporting the stability necessary for fostering and growing economic relationships and protecting crucial trade routes. Maritime security agencies also contribute to the Blue Economy through their defence of important maritime assets and infrastructure against threats such as maritime terrorism.

A range of additional maritime security operations are crucial for continued safe and effective commercial activities in the world's oceans. Managing illegal activities and maritime crime, including piracy, IUU fishing, and people and drug trafficking activities, requires not just effective compliance activities, but ongoing surveillance

and monitoring of vast, and often remote, stretches of ocean.[77] The data gathered by maritime security agencies through these activities provides critical information relevant to the Blue Economy, including weather and oceanic conditions, bathometric and oceanographic data, and vessel tracking. This data, much of which is shared with industry and across jurisdictions, provides reliable and accurate information to assist marine industries plan and manage their business activities, as well as providing insights into potential new opportunities for ocean-based economic development.

Finally, maritime security operations are often central to disaster response, search and rescue operations, and maritime incidents, such as oil spills or accidents at sea. In this regard, they play an important role in protecting human life and property, as well as environmental health.[78]

## Maritime security as a component of the Blue Economy

The other important, but often overlooked, role that maritime security operations and agencies play in supporting the Blue Economy is by being themselves a source of economic development and growth. This role is difficult to quantify, given the wide array of industries it incorporates and difficulties in effectively defining the extent of maritime security operations across both the public and private sectors.[79] Although the full extent of the contribution of maritime security to global economies remains poorly understood, it is likely to be significant and growing.

Table 7 contains examples of areas in which maritime security provides essential services to the Blue Economy across all of its four interpretations. Although far from exhaustive, this demonstrates the central role that maritime security will continue to play in the Blue Economy regardless of the lens through which it is viewed.

| | **Oceans as natural capital** | **Oceans as livelihoods** | **Oceans as good business** | **Oceans as a driver of innovation** |
|---|---|---|---|---|
| **Maritime security as an enabler of the Blue Economy** | Guarding against IUU fishing, including within protected areas | Delimiting jurisdiction, enforcing regulations, and guarding against piracy; search and rescue | Securing trade routes, diplomatic activities, and surveillance and monitoring; provision of oceanographic data to industry | Innovation associated with improvements in surveillance and monitoring, defence activities, and patrol vessels and equipment |
| **Maritime security as an component of the Blue Economy** | Public and private sector employment/economic activity associated with:<br>• surveillance and compliance activities;<br>• shipbuilding;<br>• defence activities; and<br>• international diplomacy | | | |

*Table 7: Examples of Maritime Security interactions with the Blue Economy across the four identified lenses*

# Part III: The Blue Economy in Australia

## Australian literature through the Blue Economy lenses

The Australian Government has stated: 'A blue economy is one in which our ocean ecosystems bring economic and social benefits that are efficient, equitable and sustainable'.[80] The Australian literature that explicitly addresses the Blue Economy was explored against each of the four identified lenses, with a primary focus on the lenses of 'oceans as good business' and 'oceans as a driver of innovation' being found.

### Lens 1: Oceans as Natural Capital

No explicit evidence of the 'oceans as natural capital' lens was found in the Australian context. However, it is common for Australian environmental NGOs to reference and promote the economic benefits of conservation, including MPAs.[81] Although the importance of accounting for ecosystem services was a key tool associated with this lens, there is limited evidence that this method is regularly employed in the Australian context.[82] Ecosystem services valuation is not currently included within the Australian Institute of Marine Science (AIMS) index of marine industries (see below) and therefore is not considered within current or future estimates of the 'worth' of Australia's Blue Economy.

### Lens 2: Oceans as Livelihoods

Australia has engaged with the concept of the Blue Economy through the 'oceans as livelihoods' lens primarily as part of its aid program, and particularly in relation to programs around fisheries and aquaculture. These programs actively seek to encourage and promote the development of small-scale enterprise around fisheries production, especially focused on developing greater private sector and community engagement in fisheries and aquaculture.[83] Australian aid programs have been a key driver in the development of community based approaches to fisheries management in the Pacific Ocean.[84] Australian universities and NGOs are also active participants in development of livelihood approaches to fisheries management throughout the region, including the Pacific and Indian oceans and in East Asia.[85]

In recent years, these programs have been expanded into the 'oceans as a driver of innovation' lens, with the increasing emphasis on innovation as a driver of development opportunities. In 2015, the Commonwealth Government launched Innovation Xchange, a program managed by the Department of Foreign Affairs and Trade (DFAT) in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO). This program aims to support innovation through the DFAT aid program, with one of its focus areas specifically related to identifying and supporting 'science, technology and innovation related to oceans and coastlines that can support economic development and diversification in developing economies in the Indian Ocean region'.[86] This has been progressed through the development of the Innovation Xchange 'Blue Economy Challenge' in partnership with WWF and the Indian Ocean Rim Association, among others. The Challenge aims to encourage the development and transformation of aquaculture practices within the Indian Ocean region through a competition soliciting innovative ideas relating to aquaculture feed, new ocean products, and the development of new technologies and practices to improve the environmental and economic sustainability of aquaculture operations.[87]

### Lens 3: Oceans as Good Business

To date, the 'oceans as good business' lens is exemplified by a focus on valuation studies that seek to quantify the worth of marine industries in Australia and project their future capacity for growth. For example, AIMS has been developing a regular valuation of existing maritime industries since 2008, known as the AIMS Index of Marine Industry.[88] These studies categorise and evaluate a range of maritime sectors to provide an overall estimation of the 'worth' of the ocean economy, which is increasingly being referred to as Australia's 'Blue Economy'. The most recent assessment values the contribution of marine industries to Australia's economy as $74.2 billion in value added, or 4.8% of national Gross Domestic Product (GDP). It also estimated that the marine industry's total employment was almost 400,000 full-time equivalent workers.[89] Under this reporting framework, all marine industries listed in Table 8 are considered to be a component of the Blue Economy.

The AIMS indices and other related studies indicate that Australia's ocean economy is dominated by the value of the oil and gas sector, driven by considerable investment over the last five years.[90] Outside the oil and gas sector, Australia has limited marine industrial aspirations and plans for industrial developments in the offshore area. However, there are some signs that the global trend towards deep sea mining and offshore energy opportunities are beginning to translate to the Australian context.[91]

The high relative size of the marine tourism sector is also recognised in a range of reports, with the quality of the coastal and marine environments in Australia seen as a major drawcard for international and domestic tourism.[92]

| | Direct value of production | Direct value added | Indirect value added | Total value added |
|---|---|---|---|---|
| **Marine resource activities and industries** | | | | |
| **Fishing** | | | | |
| Marine-based aquaculture | $994.4 | $662.7 | $255.7 | $918.4 |
| Commercial fishing (wild captures fisheries) | $1,503.3 | $824.0 | $551.3 | $1,375.3 |
| Recreational fishing | $2,164.8 | $2,164.8 | $1,523.8 | $3,688.6 |
| **Offshore oil & gas exploration and extraction** | | | | |
| Oil exploration | $3,512.0 | $1,859.4 | $1,518.4 | $3,377.8 |
| Oil production | $9,144.5 | $5,961.4 | $2,801.8 | $8,763.2 |
| LPG | $1,265.1 | $824.8 | $387.6 | $1,212.4 |
| Natural gas | $16,304.7 | $10,629.2 | $4,995.6 | $15,624.8 |
| **Marine-related service activities and industries** | | | | |
| **Boat/shipbuilding, repair & maintenance services and infrastructure** | | | | |
| Shipbuilding & repair (civil and defence) | $2,966.0 | $1,234.0 | $2,117.7 | $3,351.7 |
| Boatbuilding & repair (including recreational vessels) | $1,235.0 | $429.0 | $736.2 | $1,165.2 |
| Marinas and boating infrastructure | $699.3 | $250.5 | $402.2 | $652.7 |
| Marine equipment retailing | $1,393.0 | $223.3 | $157.4 | $380.7 |
| **Marine tourism and recreational activities** | | | | |
| Domestic consumption of tourism goods and services | $23,815.3 | $13,128.4 | $13,895.2 | $27,023.6 |
| International consumption of tourism goods and services | $4,239.0 | $2,336.8 | $2,473.3 | $4,810.1 |
| **Water transport** | | | | |
| Water-based transport of passengers and freight | $3,847.0 | $1,409.0 | $1,586.1 | $2,995.1 |

Note: Each sub-sector was analysed separately. Consequently, the results of the indirect value added are not additive. Total indirect contribution was estimated by removing expenditure associated with 'marine sub-sectors' to avoid double-counting.

*Table 8: Direct and indirect economic contribution by marine sub-sector, 2013-14 ($ million)*[93]

Although the AIMS index provides insights into the total value of the Australian ocean economy, a number of challenges and gaps in the research remain in this area. For example, there are significant definitional issues relating to what constitutes 'marine tourism', which has resulted in considerable variations between studies.[94] In addition, ship-based trade is a major component of Australia's import and export activities. However, the outsourcing of shipping ownership overseas means the full potential value of the shipping sector to the Australian ocean economy is unlikely to be captured by the economic valuation studies completed to date.[95]

There are other significant gaps in current valuation studies in terms of sectors represented. Broader contributions from the defence and maritime security sector (outside shipbuilding) are a notable gap.[96] In addition, in areas such as marine environmental research and marine education and training – in which Australia excels – valuations have not been undertaken.[97] Perhaps in response to the gaps in these large 'meta-level' analyses of marine industries, it is increasingly common for individual sectors to commission economic valuation studies that they seek to employ in negotiations over resource access and efforts to build social licence.[98]

Despite widespread recognition of the important economic contribution of the ocean economy and its future need for research support (see below), Australia does not have a coordinated national ocean industry development plan or marine spatial plan designed to manage industrial ocean uses. To date, marine planning has prioritised marine protection through the creation of MPA networks, with consideration of ocean uses outside these reserves managed largely on a case by case basis through individual regulatory agencies.[99]

### Lens 4: Oceans as a Driver of Innovation

The 'oceans as a driver of innovation' lens in Australia is exemplified through policy documents like the 2015 National Marine Science Plan. This plan, coordinated by the National Marine Science Committee, built on the AIMS index of marine industries to project future opportunities for growth and how they might be supported by the Australian science community.[100] The plan estimates that Australia's Blue Economy (incorporating the full suite of sectors within the ocean economy) will be worth around $100 billion a year by 2025, and identified a range of research and development strategies aimed at facilitating this growth. These strategies were developed around addressing seven key challenges that may inhibit the growth of a Blue Economy.[101] The first of these challenges is listed as maintaining marine sovereignty and security and safety, others include:

- achieving energy security;
- ensuring food security;
- conserving biodiversity and ecosystem health;
- creating sustainable urban coastal development;
- understanding and adapting to climate variability and change; and
- developing equitable and balanced resource allocation.[102]

Strategies related mostly to targeted research and development activities designed to address each of these challenges and included ongoing data collection, such as oceanographic surveys and mapping. Strategies also included the development of decision support tools, capacity development programs, and effective modelling and forecasting capabilities.

# Maritime security and the Australian Blue Economy

Australia is keenly aware of the important interplay between maritime security and the Blue Economy, particularly in relation to the development of maritime security arrangements in the Indian and Pacific oceans.[103] For example, although not explicitly referencing the Blue Economy, Australia's 2016 Defence White Paper (DWP) indicates a strong engagement with the concept of promoting maritime security in order to protect and sustain economic use of the oceans.[104] This includes recognition of Australia's regional security interests, which involve protecting important trade routes with major trading partners, such as China, Japan and the Republic of Korea, and working in partnership with regional security forums to reduce and eliminate IUU fishing in the Pacific Islands, Indian Ocean, and the seas of East Asia.[105] These activities are conducted in concert with an active aid program that seeks to address the systemic drivers of IUU fishing through support for improved governance arrangements. In the Pacific Ocean, for example, the Australian Government actively supports the principal regional fisheries bodies, including the Pacific Islands Forum Fisheries Agency and the Secretariat of the Pacific Community's Fisheries, Aquaculture and Marine Ecosystems Division.[106]

The Australian Defence Force (ADF) is also actively engaged in a range of other activities that enable and support the Blue Economy, including border security activities targeting transnational crime and people smuggling.[107] The ADF also participates in ongoing surveillance and monitoring activities, such as the Integrated Marine Observing System, which gathers regular physical, biogeochemical, and biological data relating to oceanic conditions. This data is then shared with a range of private and public sector actors to assist in management, research, development, and commercial activities.[108]

Australia's 2016 DWP points to significant investments in amphibious vessels, offshore patrol vessels, frigates, and submarines, and includes a particular emphasis on innovation in these activities, thereby highlighting the role of maritime security as a sector within the Australian Blue Economy.[109] Although shipbuilding is included in the AIMS index of marine industries as a significant ocean industry, a range of other areas of economic development related to maritime security are less well recognised but have substantial potential for growth in employment and revenue.

## Comparing Australia with the international literature

In the Australian context, the primary lens used to interpret the Blue Economy appears to relate to the 'oceans as a driver of innovation' lens, and, to a lesser extent, the 'oceans as good business' lens. In both these cases, however, the application of the concept was seen to be less developed in Australia than was demonstrated internationally. In particular, the central role given to Marine Spatial Planning as a governance tool to develop and support Blue Growth seen in many countries, and, in particular, in Europe, has not translated to Australia to date. Similarly, the focus on the development of innovation hubs and maritime clusters often associated with the 'oceans as a driver of innovation' lens has not been replicated in Australia so far. Another key difference is that the private sector has played a relatively limited role in developing an Australian Blue Economy, despite being actively engaged in the promotion and development of Blue Growth strategies overseas – as illustrated by the way in which organisations such as the EIU and WOC have taken up the concept.[110]

Australia has indicated some engagement with the 'oceans as livelihoods' Blue Economy lens, although this has been almost exclusively through its aid program, and, in particular, through its active involvement in developing and promoting community based fisheries management programs in the Pacific Ocean.[111] Ideas of promoting diverse economies and small scale enterprises based around improving community wellbeing may be equally applicable to Australian communities, especially in relation to Indigenous Australians' engagement with ocean uses and livelihoods.

# Part IV: Building a Blue Economy in Australia

Understanding the different Blue Economy lenses sheds light on potential areas of consensus and conflict, which will be relevant for future Blue Economy planning. These are outlined below as challenges and opportunities in the development of an Australian Blue Economy.

## Challenges

One of the most fundamental challenges to the effective implementation of a Blue Economy is the inherent conflict in the different interpretations of the concept. The debate over which sectors should and should not be included under the Blue Economy umbrella is among the most significant of these conflicts. The inclusion of carbon intensive industries like oil and gas will, in particular, be a likely source of considerable conflict between the 'oceans as natural capital' and 'oceans as good business' lenses. There are inherent contradictions in the inclusion of these industries in a model that seeks to address climate change. Yet it could also be argued that including carbon intensive industries provides greater incentives and opportunities for these sectors to explore cleaner alternatives and mitigation strategies, such as Blue Carbon. In other words, if the practical application of a Blue Economy model involves accounting for environmental externalities, then incorporating those sectors for which externalities are most problematic will be critical to its success. In purely practical terms, any planning activities around a Blue Economy, especially Marine Spatial Planning exercises, which neglect to include consideration of the oil and gas sector will be largely ineffective.

Another conflict between the different interpretations of the Blue Economy lies in questions of scale. Although big business, including multi-national corporations, may be able to readily engage in Blue Economy development activities, ensuring equitable access to the benefits of the Blue Economy requires active consideration of small- and medium-sized enterprises, as well as subsistence and recreational users and Indigenous people. Addressing this may require Blue Economy actors to actively engage with alternative, and sometimes conflicting, 'lenses'.

Continued expansion and growth of the Blue Economy will almost certainly increase the likelihood of resource conflict both within and across jurisdictions. This is recognised by the emphasis placed on effective maritime security arrangements across all the Blue Economy lenses, but will also require strategic and inclusive planning and regulatory frameworks.

# Opportunities

There are some important areas of consensus across the different Blue Economy lenses identified in this study. Acknowledgement of the important role of maritime security and Ecosystem Based Management appears to be seemingly universal, although the ambiguity of both these terms is also noted.[112] These concepts, however, may provide an important base on which to build, by providing an area of common agreement across different stakeholder groups.

International examples point to some key opportunities that could be pursued in the Australian context through a more strategic and forward-thinking engagement with the concept of a Blue Economy – one which builds on the strengths of all four lenses. The different characteristics of the three oceans surrounding Australia, and the communities that live beside them, will dictate the focus of the Blue Economy in different regions. For example, Southern Australia, with its productive fisheries, active aquaculture industries, and wild oceanic conditions, would be an ideal location for Blue Economy developments that centre around ocean-based renewables, such as offshore wind, as well as efforts that aim to improve the sustainability and productivity of fisheries and aquaculture operations. The more densely populated East Coast of Australia will require ongoing improvement in coastal protection and management in the face of climate change and rapid urbanisation. Its busy port system also provides opportunities for improvements in the environmental and economic sustainability of shipping operations. The Indian Ocean is currently a particular focus of the oil and gas and deep sea mining sectors, and these are likely to be the areas in which the greatest level of conflict between the competing Blue Economy discourses will take place. Substantial consideration will need to be given to questions of social licence and community expectations in relation to the sustainable development of these activities. All three oceans provide undiscovered opportunities for future biotechnology. Table 9 contains some discussion points around the applicability of the four Blue Economy lenses in different Australian contexts.

At the University of Wollongong (UOW), the Australian National Centre for Ocean Resources and Security (ANCORS) is leading an ambitious university wide research agenda, funded by the UOW Global Challenges program, which seeks to explore the ways in which the Illawarra and South Coast region of New South Wales can build a Blue Economy. This research program aims to develop a community based

vision for the Blue Economy in the region, which recognises and acknowledges the different lenses through which the concept is understood. The first stage involved academics from across UOW meeting in a series of targeted focus groups to workshop ideas about the role the university might play in supporting the growth of a Blue Economy in the region. The focus groups brought together academics across diverse disciplinary areas, including all five university faculties, to discuss five potential areas of Blue Economy development in the region. They were:

1. *Ecosystem Protection, Management and Enjoyment* (including ecosystem services, passive use, recreation, and tourism);
2. *Blue Coastal Zone Management* (incorporating coastal development, hazard management, and wastewater and sewage);
3. *Defence and Surveillance* (incorporating maritime security and monitoring programs);
4. *Blue Industry and Energy Production* (incorporating deep sea mining, ocean-based renewables, desalinisation, and maritime infrastructure and industry, such as ports); and
5. *Blue Harvesting (Fisheries and Aquaculture)* (including commercial fishing, fish processing, and aquaculture operations).

These focus groups suggested five cross-cutting project ideas that would assist to provide an overarching framework for the future development of a regional Blue Economy, including a plan to 'map' the social, economic, and environmental values of the region. They also identified an additional seven sector-specific projects that would improve the social, economic or environmental outcomes of these sectors. These ideas ranged from strategies to improve the environmental sustainability of recreational fishing to the 'greening' of coastal tourism accommodation and the revitalisation of Port Kembla. UOW is currently engaging with external partners and stakeholders with the aim of developing a blueprint for a Blue Economy in the Illawarra and South Coast, and will monitor the success of the program over time**.** If successful, this strategy may provide a useful case study through which future Blue Economy programs can be developed around the country.

| | Oceans as natural capital | Oceans as livelihoods | Oceans as good business | Oceans as a driver of innovation |
|---|---|---|---|---|
| **Area** | Communities surrounding existing MPAs, degraded environmental areas requiring restoration | Northern Australia, Indigenous communities, fishing communities around Australia, etc. | East Coast of Australia, Southern Australia | East Coast of Australia, Southwestern Australia |
| **Scale/actors** | Small and medium enterprises | Small and medium enterprises | Larger scale business and corporations, public sector (e.g., Department of Defence) | Academic institutes, industry, and Government |
| **Sectors/ activities** | Eco-tourism, Payment for Ecosystem Services, Blue Carbon, environmental offsets, etc. | Focus on fisheries and aquaculture; development of improved supply chains, value added seafood processing, and local markets for seafood products and associated tourism opportunities; specialist niche industries, such as small boat building, marine education, monitoring and surveillance activities, etc. | Maritime clusters around significant sectors (e.g., shipbuilding, ports, maritime security, etc.) supported by centres of research and development and associated tourism activities (e.g. 'industrial' tourism); business incubators | Development of maritime innovation hubs and business incubators embracing all sectors but particularly emerging industries like renewables, offshore aquaculture, biotechnology, and deep sea mining |

*Table 9: Discussion points: Applying the Blue Economy lenses to Australia*

# Conclusion

The Blue Economy is a new, forward-looking and inclusive approach to thinking about our oceans. It has emerged at a time of considerable change in the way in which ocean spaces are conceived of and used. Two competing new discourses are emerging around the ocean. Previously considered an inexhaustible, untamed wilderness, the oceans are now increasingly seen as a 'threatened' place, at risk from pollution, habitat loss, overfishing, and the impacts of climate change, including ocean acidification. At the same time, nations around the world are turning their attention to the oceans as a new source of economic development and growth, and seeing the oceans as 'industrialised' spaces, with growing emphasis on the demarcation of national jurisdiction and the uses that occur within and beyond these jurisdictions. The Blue Economy brings these two discourses together and attempts to marry the notion of ocean-based development with environmental stewardship and protection. In this context, the Blue Economy can be seen as providing a unique opportunity for harnessing new growth, improved wellbeing, and more sustainable use of our oceans. Yet, as ocean spaces become increasingly crowded with often competing uses across jurisdictional boundaries that are contested or poorly defined, the Blue Economy may also pose a serious threat by generating conflict and disputes. For this reason, the Blue Economy and maritime security are mutually inclusive and interdependent concepts – each depends on and supports the other. Understanding the different ways the Blue Economy is conceived and understood helps to identify areas of future potential conflict, as well as areas on which consensus-based diplomatic approaches might be built. More detailed examination of the interlinkages between maritime security and the Blue Economy is required, alongside the development of strategic policies that advance both. In the Australian context these efforts may include:

- more explicit consideration of maritime security in ocean economy valuation processes;
- active engagement of Department of Defence and security personnel in Blue Economy planning processes;
- development of marine spatial planning exercises and industry development strategies to provide pathways through which conflict resolution can be negotiated and facilitated; and
- development of support mechanisms that encourage innovation and growth of environmentally sensitive marine industries, with consideration given to the spectrum of Blue Economy lenses (this may include new and emerging business opportunities within the maritime security sector).

# Appendix: Results of Cluster Analysis

An initial word frequency analysis was conducted on the documents listed in Table 3. It indicated some dominant themes across the documents (Figure 3), including:

- economic development and growth, including resource use and business activities (e.g., fisheries, aquaculture, tourism, and industry);
- ecosystems and environment, including oceans, marine, and coastal environments;
- innovation and research, including knowledge, data, new opportunities, and science;
- governance, including regional and national scales, institutions, management arrangements, and governance approaches; and
- people, including capacity, food security, and partnerships.


*Figure 3: Word frequency in key Blue Economy documents*

These five themes provided a framework for further identifying, collating and categorising key phrases and concepts (or sub-themes) contained within the literature by coding the executive summaries and introductions of each document. A list of the primary sub-themes identified through this analysis is contained in Table 10.

| Economic themes | | Environmental themes | | Social themes | | Innovation and technical capacity | | Governance tools or approaches | |
|---|---|---|---|---|---|---|---|---|---|
| **Blue (economic) growth** | 28 (80%) | Sustainability/ balance | 21 (60%) | Capacity building | 20 (57%) | Innovation (technical) | 28 (80%) | Co-ordination/ integration | 26 (74%) |
| **Growth strategy (sector based)** | 25 (71%) | Impact abatement or mitigation | 20 (57%) | Food security | 18 (51%) | Security and/or surveillance | 21 (60%) | Effective governance or regulatory frameworks | 17 (49%) |
| **Employment** | 14 (40%) | De-carbonisation/ climate change mitigation | 17 (49%) | Poverty alleviation | 15 (43%) | Investment | 19 (54%) | Marine Spatial Planning | 19 (49%) |
| **Livelihoods** | 11 (31%) | Restoration | 13 (37%) | Inclusiveness | 13 (37%) | Research and Development, including commercialisation | 19 (54%) | Law and policy links (e.g., United Nations Convention on the Law of the Sea/SDGs) | 16 (46%) |
| **Diversification/ maritime clusters** | 7 (20%) | Protection | 13 (37%) | Equity | 13 (37%) | Private sector involvement (e.g., public-private partnerships) | 14 (40%) | Ecosystem services valuation or payment | 15 (43%) |
| | | Maintaining environmental health | 9 (26%) | Wellbeing | 10 (29%) | Innovative financing (e.g., incentives or taxes) | 14 (40%) | Accounting/valuation of ocean industries | 15 (43%) |
| | | | | Social license | 6 (17%) | Data sharing | 12 (34%) | Stakeholder engagement | 15 (43%) |
| | | | | | | | | Ecosystem Based Management | 13 (37%) |
| | | | | | | | | Monitoring and reporting | 12 (34%) |
| | | | | | | | | MPAs | 10 (29%) |
| | | | | | | | | Integrated Coastal Management | 8 (23%) |

*Table 10: Key themes and sub-themes within Blue Economy grey literature, noting number and percentage of documents in which the concepts were referenced*

A cluster analysis was then conducted in order to identify the co-occurrence of key themes. This was conducted through NVIVO11 software, using a Pearson's correlation co-efficient. The themes 'innovation' and 'blue economic growth' were excluded from the analysis given their near-universal inclusion within the literature. The results of this analysis are contained in Figure 4, and identify four key clusters:

1. sector based growth strategies, accounting, and maritime clusters;
2. investment, innovative financing, and private sector involvement;
3. livelihoods, food security, and poverty alleviation; and
4. environmental protection and restoration, MPAs, Ecosystem Based Management, and community health and wellbeing.

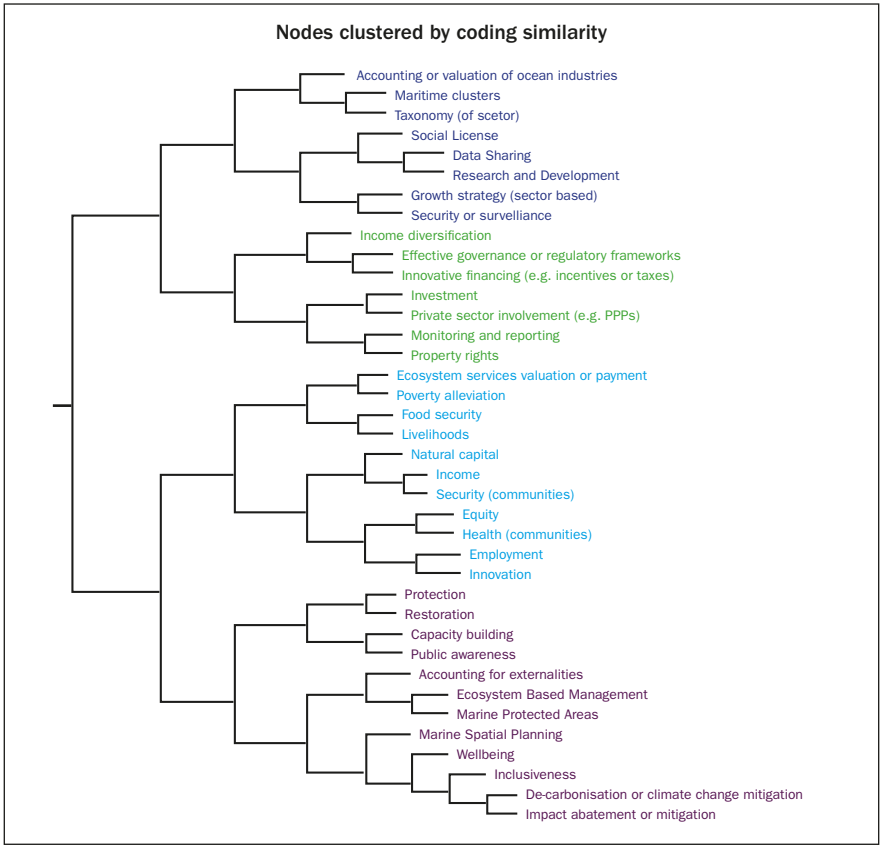


*Figure 4: Results of the cluster analysis indicating co-occurrence of key themes within Blue Economy grey literature*

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