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# GOVERNING COASTAL RESOURCES

## IMPLICATIONS FOR A SUSTAINABLE BLUE ECONOMY

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Summary for Policymakers

# Acknowledgements

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## Summary for Policymakers

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Produced by the International Resource Panel

This document highlights key findings from the full report and should be read in conjunction with it. References to research and reviews on which this report is based are listed in the full report.

The full report can be downloaded at:

<https://www.resourcepanel.org/reports/governing-coastal-resources>.

Additional copies can be ordered via email: [unep-irpsecretariat@un.org](mailto:unep-irpsecretariat@un.org)

# Foreword

Our shared ocean is at risk.

Two thirds of our planet is covered by the ocean, a system that not only supports life on Earth and human wellbeing but also regulates the climate. The ocean provides oxygen, food, energy, water and raw materials. It offers remarkable cultural services and is a source of jobs and economic activity across our planet.

Despite its importance, the future of our world's ocean is at a critical point. Over-exploitation, pollution and climate change are causing a serious loss of marine biodiversity. Without a healthy ocean all the services it provides will be disrupted and the consequences will be dire.

The 2030 Agenda dedicates Sustainable Development Goal 14: Life Below Water to “conserve and sustainably use the oceans, seas and marine resources”. As we enter the decade for achieving the 2030 Agenda, we need urgent action to mitigate the detrimental effects human activities are triggering, from those undertaken at sea or in coastal areas, to those occurring inland, hundreds of kilometres away from the coast.

A wide range of initiatives across the planet are working in this direction. This includes UNEP's ecosystem-based marine and coastal management and ocean governance work: the Sustainable Blue Economy Initiative, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, and efforts of the Regional Seas programmes. In addition, scientific findings continue to strengthen our knowledge base for ocean policy-making and management solutions, a focus of the UN Decade of Ocean Science for Sustainable

Development (2021-2030), and the UN Decade for Action on Ecosystem Restoration (2021-2030) which UNEP is proud to co-lead with numerous partners.

This International Resource Panel report, “Governing coastal resources: implications for a sustainable blue economy”, outlines key pathways through which land-based activities influence coastal resources, across land-sea boundaries and at multiple spatial scales. This report also stresses the need for a holistic governance approach that accounts for the connections between land-based activities and coastal resources. The report provides practical options to strengthen existing land-sea governance practices and presents new governance structures to reduce the impact of land-based activities on coastal resources and support the transition to a sustainable blue economy. We have a significant opportunity and responsibility to mitigate human impacts.

It is time to act and save our Blue Planet for humanity to thrive. I believe this important report of the International Resource Panel will make valuable contributions to an urgently needed shift towards more comprehensive and effective ocean stewardship, placing us on a sustainable ocean trajectory that we are all relying on. Business as usual is no longer an option. COVID-19 has demonstrated that humanity can respond collectively to a shared global challenge – let's build on this to create an unstoppable movement for sustainable oceans for All.

**Ligia Noronha**

*Director, Economy Division  
UN Environment Programme  
(April 2021)*



# Preface

Historically the management of our ocean has been fragmented by natural, legal and administrative boundaries. Land-based and ocean-based activities have been governed independently creating a disconnect between where impacts are experienced and where they originate.

It is widely recognised that land-based human activities significantly impact the marine environment. For instance, estimates suggest that 80 per cent of marine pollution originates on land. Still, there are very few, if any, truly effective governance mechanisms that take account of land-ocean interactions.

Since 2007 the International Resource Panel has provided independent, authoritative and policy-relevant scientific assessments on the status, trends and future state of natural resources. In this report, our focus is on coastal resources, specifically how land-based human activities affect the quality and availability of coastal and marine resources.

This report identifies the numerous pathways through which land-based activities generate impacts on coastal resources, acknowledging that they can differ, depending on the location, type, condition and resilience of the local ecosystems. It also identifies implications for the sustainable blue economy of changes to the coastal resource base caused by land-based activities. This is further explored in detailed assessments of shrimp aquaculture and coastal mining.

Based on its scientific findings, the report calls for vastly improved governance approaches to reduce the negative impacts of land-based activities on coastal resources as well as supporting the transition to a sustainable blue economy.

We have a significant opportunity and responsibility to reverse human impacts on our shared ocean.

We thank the lead authors and their team for their dedicated efforts to draw together an evidence base that demonstrates beyond question the need for enhanced governance coordination between terrestrial activities and marine resources. As the report advocates, future governance systems should not be constrained by existing boundaries which often disconnect causes from effects. Instead, greater emphasis should be placed on safeguarding our natural resources, advancing the sustainable development goals of the Agenda 2030 and breaking away from current unsustainable resource use patterns.



**Izabella Teixeira**  
*Co-Chair*  
*International Resource Panel*



**Janez Potočnik**  
*Co-Chair*  
*International Resource Panel*





# KEY MESSAGES

- 1. Living coastal resources are most threatened by land-based activities.** Land-based activities generate most impacts on living coastal resources, with agriculture, ports and harbours, and aquaculture being particularly impactful land-based activities. Biodiversity is the coastal resource most impacted by land-based activities. Although evidence is limited, it appears that non-living coastal resources are largely unaffected by land-based activities.
- 2. All parts of the blue economy are vulnerable to changes in coastal resources, particularly fishing, aquaculture and tourism.** The transition to the sustainable blue economy can be undermined by the negative effects of land-based activities on coastal resources. The governance of land-based activities is therefore critical to achieving a sustainable blue economy.
- 3. Existing land-sea governance approaches cannot cope with the impacts on coastal resources created by land-based activities.** Fragmented governance impedes coordinated action to reduce the effects of land-based activities on coastal resources. This problem is magnified when land-based activities originate in other countries or contribute to the degrading of coastal resources at a regional scale.
- 4. Land-sea governance urgently needs to be strengthened to protect coastal resources from the impacts of land-based activities and to support the transition to a sustainable blue economy.** New governance frameworks are required that connect land and sea together into coherent governance systems that enable impacts to be considered from their source through to where they generate impacts.
- 5. Tackling the impacts of land-based activities on coastal resources is a global priority.** The most impactful land-based activities on coastal resources should be prioritized for urgent action as these will generate the most benefit most quickly to the sustainable blue economy.





# INTRODUCTION

## Coastal resources are critical to people, nature and the economy

Coasts provide food, energy and minerals; support cultural, recreation, leisure and health opportunities; and provide space for critical transport and trade infrastructure. Yet coasts are subjected to many interconnected drivers of change as shown in Figure 1.

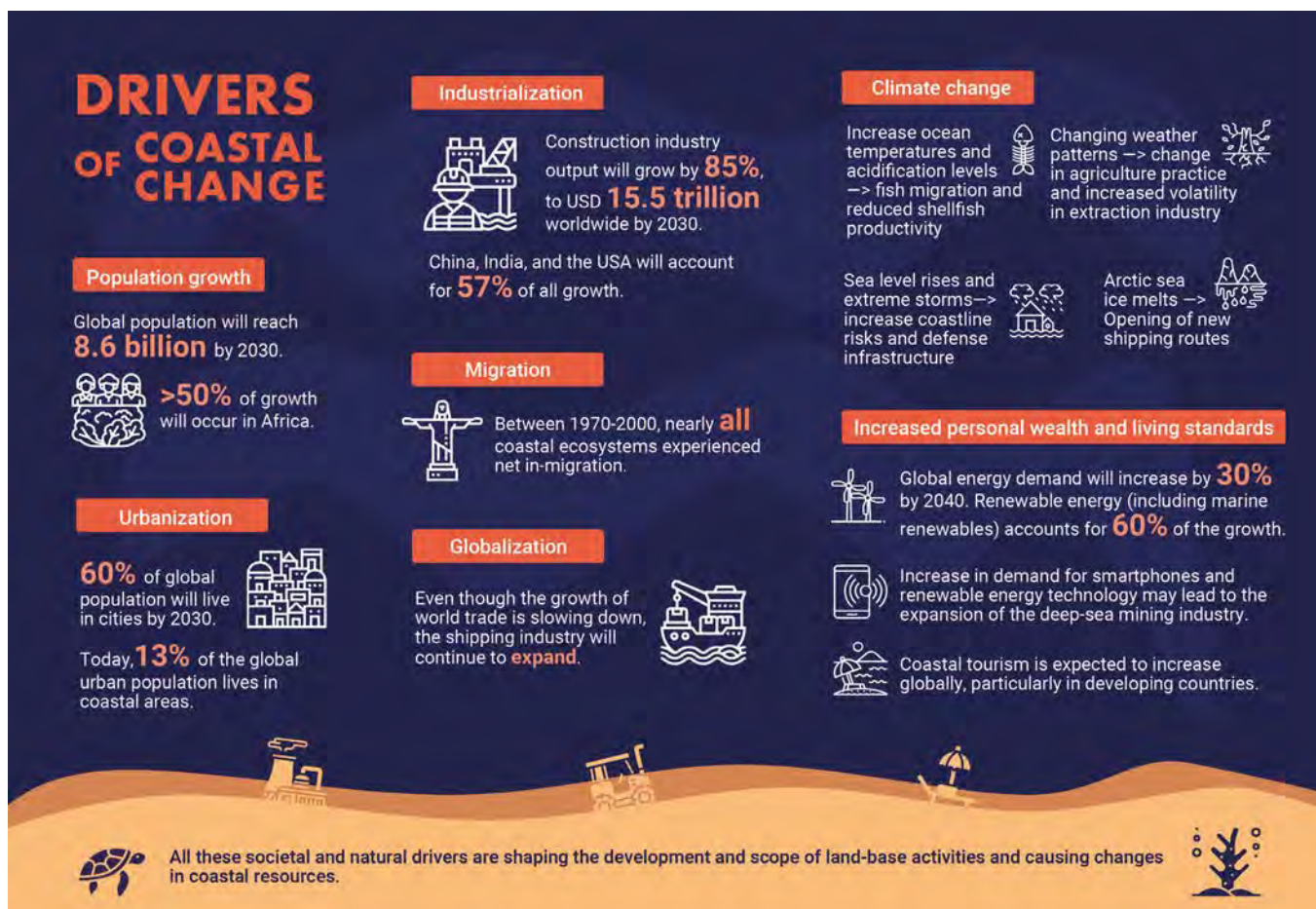


Figure 1. Summary of drivers of coastal change

## A sustainable blue economy requires healthy coastal resources

Coastal resources are a key focus of the emerging Sustainable Blue Economy agenda (Box 1 and Figure 2). The global ocean-based economy is estimated to be worth \$3 trillion USD per year, which is five per cent of global GDP (United Nations, 2017a). It is widely acknowledged that blue economic growth must sustain and ideally enhance the natural capital upon which it depends as well as generating equitably distributed economic and social benefits. Achieving the full potential of the sustainable blue economy involves recognizing and tackling the negative externalities from land-based activities.

### BOX 1: A sustainable blue economy

There is no globally agreed definition of a Sustainable Blue Economy, however, the working definition adopted in this report is *an ocean-based economy that provides equitably distributed social and economic benefits for current and future generations, while restoring and protecting the intrinsic value and functionality of coastal and marine ecosystems and is based on clean technologies and circular material flows* (adapted from WWF, 2018).



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**Figure 2.** Selected sustainable blue economy sectors

## Land-based activities impact coastal resources

It has long been recognized that a particular challenge in coastal areas, particularly in Small Island Developing States, is the management of land-based activities that have detrimental impacts on coastal resources. Many of these impacts are the unintended side-effects of land-based human activities that are not taken into account within existing governance frameworks. Developing more effective approaches to the governance of land-based activities to limit their impacts is therefore key to conserving coastal natural capital and associated services upon which people depend. Yet governance responses to coastal resource problems that originate on land remain as difficult as ever to address and are likely to become more challenging as the impacts of climate change, such as acidification and warming, take hold.

## BOX 2: Impacts of land-based activities on coastal resources

In this report, a 'land-based activity' is any activity that takes place either fully or partly on land. Examples of impacts on coastal resources arising from land-based activities include plastic waste entering coastal areas from rivers and drainage channels; mangrove removal to make way for hotel or aquaculture development (which releases stored sediment that smothers nearby delicate coral ecosystems); nutrient-rich domestic waste discharges from cities that strip oxygen from marine waters suffocating marine life; and protein demand from urban populations pushing 33 per cent of the world's fish stocks to be fished beyond biological sustainability (FAO, 2018a).



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## Determining pathways to a sustainable blue economy

The purpose of the study was to determine governance approaches that could reduce the effects of land-based activities on coastal resources and which support the transition to a sustainable blue economy. A Drivers, Pressures, State, Impact, Response (DPSIR) framework (as shown in Figure 3) was used to assess how global scale **drivers** generate land-based activities (**pressures**), which in turn affect the quality and availability (**state**) of coastal resources. The **impact** of changing coastal resources on a selection of sustainable blue economy sectors was then considered. Finally, the study presents an analysis of possible governance **responses** that can reduce the effects of land-based activities on coastal resources and thereby support the transition to a sustainable blue economy. We used a novel iterative evidence-based analysis designed to identify the individual and cumulative effects generated by land-based activities on coastal resources. In total, over 1,000 separate pieces of evidence were reviewed, supported by three workshops to validate and refine the analysis.

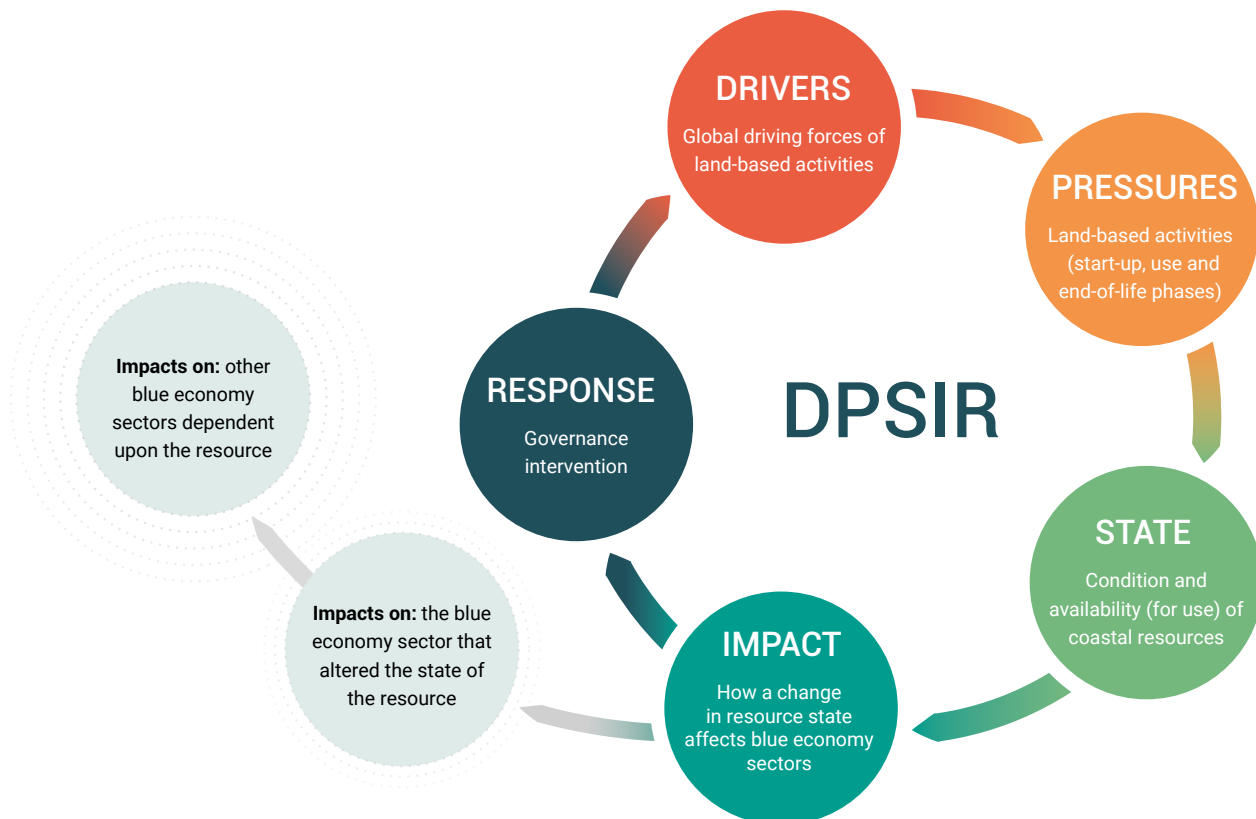


Figure 3. Illustration of the DPSIR framework

# KEY MESSAGES

## KEY MESSAGE #1: Living coastal resources are most threatened by land-based activities

Land-based activities generate multiple individual and cumulative impacts on coastal resources. There is strong evidence that all living coastal resources are highly impacted by land-based activities, with agriculture, ports and harbours, and aquaculture being particularly impactful land-based activities. Biodiversity is the coastal resource most impacted by land-based activities, as shown in Figure 4. In contrast, although evidence is comparatively limited, it seems that non-living coastal resources are largely unaffected by land-based activities.

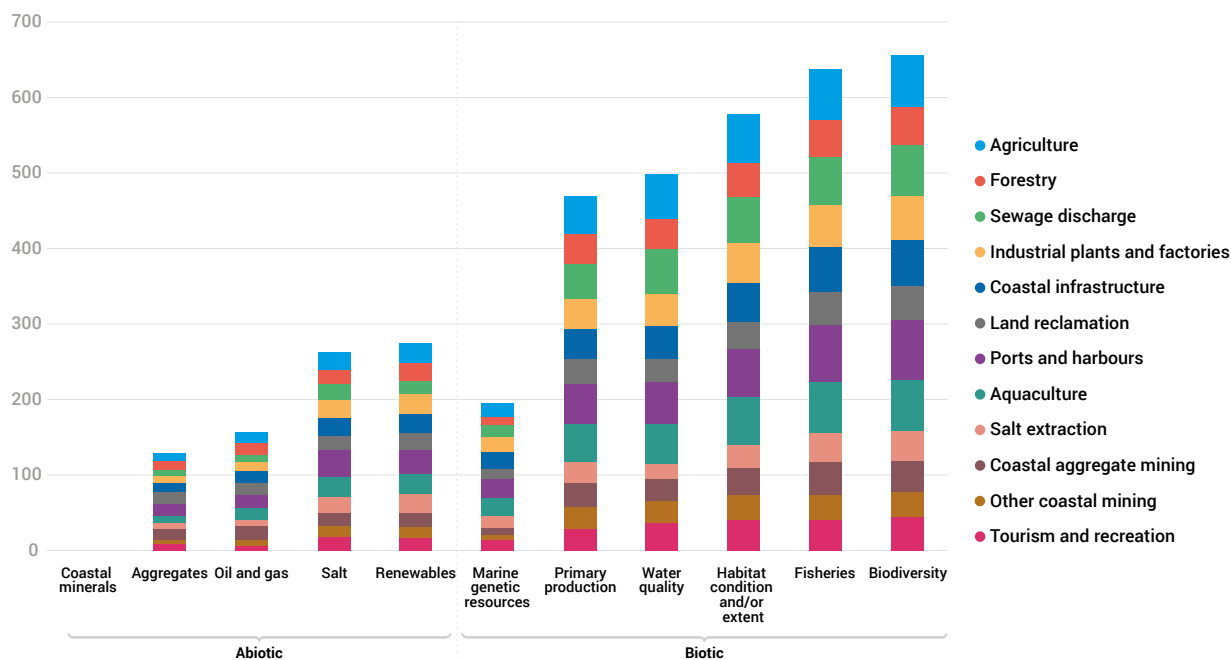


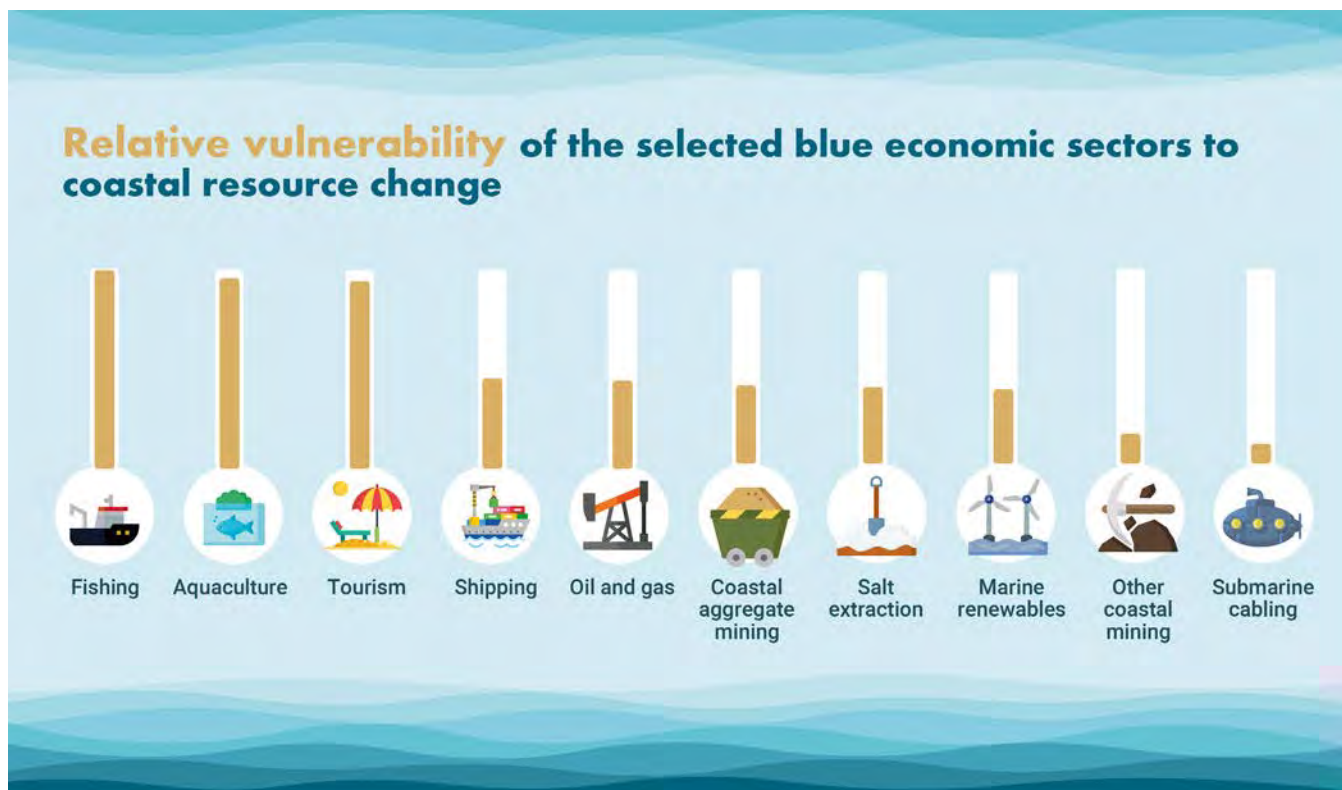
Figure 4. Cumulative influence of land-based activities on coastal resources<sup>1</sup>

<sup>1</sup> In some cases, the classification of land-based activities may create a perceived under-representation of impact. For example, tourism and recreation generate significant sewerage and waste discharges, which are treated as separate land-based activities, thereby potentially under-estimating the impact of tourism and recreation activities on coastal resources.



## KEY MESSAGE #2: All parts of the blue economy are vulnerable to changes in coastal resources, particularly fishing, aquaculture and tourism

There is an increasing focus in national and international ocean policy on the need to transition from unsustainable coastal and ocean resource use to a sustainable blue economy. It is therefore important to consider the implications, for the sustainable blue economy, of changes to the coastal resource base caused by terrestrial activities. As shown in Figure 5, all sectors of the blue economy are vulnerable to changes in coastal resources arising from the impacts of land-based activities. Fishing, aquaculture and tourism are significantly more vulnerable than other sectors, principally due to their dependency on biotic coastal resources, which are particularly at risk from the negative effects of land-based activities. Boxes 3 and 4 explore the implications of land-based activities for aquaculture and extractive activities respectively.



**Figure 5.** Relative vulnerability of selected blue economic sectors to changes in coastal resources arising from land-based activities.

### BOX 3: Shrimp aquaculture

Aquaculture has grown dramatically over the past 65 years with production dominated by Asia which has accounted for 89 per cent of world aquaculture production. Shrimp farming is commonly undertaken in coastal ecosystems such as wetlands and estuaries, and in close proximity to mangroves. Shrimp aquaculture generates significant impacts on living coastal resources and the economic sectors that rely on those resources. The loss of biodiversity, along with ecosystem structure and function, due to the removal of mangroves in unplanned and unregulated shrimp aquaculture is of particular concern. While aquaculture can damage other areas of the blue economy, aquaculture itself is highly vulnerable to degradation in the overall quality of the coastal ecosystem.



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## BOX 4: Extractive industries

Marine aggregates are a key resource in the blue economy, with urban expansion placing a high demand on aggregates. However, aggregate extraction through dredging can also significantly impact coastal ecosystems. Salt and evaporite mining are found to be one of the most vulnerable areas of the blue economy as they are dependent on the purity and quality of sea water to produce high quality products while water quality is impacted by an array of land-based activities. Extracted coastal resources underpin national economies, provide crucial raw materials for industrial activities, and are inputs to almost every sector of the global economy. Therefore, responsible aggregate extraction must be a consideration in any future development of a sustainable blue economy.





### **KEY MESSAGE #3: Existing land-sea governance approaches cannot cope with the impacts on coastal resources created by land-based activities**

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An analysis of existing governance approaches showed that land-based activities are currently managed through sector-specific arrangements with limited, if any, regard for their effects on coastal resources. Considerable variation in governance institutions, frameworks, practices and effectiveness between (and often within) nations and sectors exists, with the coastline commonly used as a legal and administrative boundary, with often radically different governance systems applied to the terrestrial and marine sides of the dividing line. This results in fragmented governance systems that impede coordinated action to reduce the effects of land-based activities on coastal resources. This problem is magnified when land-based activities originate in other countries or contribute to the degrading of coastal resources at a regional scale. The existing models of coastal governance are not able to cope adequately with the impacts created by land-based activities on coastal resources.



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## **KEY MESSAGE #4: Land-sea governance urgently needs to be strengthened to protect coastal resources from the impacts of land-based activities and to support the transition to a sustainable blue economy**

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New governance frameworks are needed that better connect land-based activities to coastal resource systems in order to enable impacts to be considered from their source through to where they are generated. Options to strengthen existing practices in land-sea governance as well as new governance approaches are presented below.

### **Options to strengthen existing practices in land-sea governance**

- **Ecosystem-based management** should be a guiding principle of coastal resource governance, as it provides a holistic approach to the consideration of all influences on coastal resources (with an emphasis on a healthy underpinning ecosystem).
- **Existing area-based management tools**, with enhancement and adaptation, should be used to counteract the impacts of land-based activities on coastal resources (such as marine protected areas, marine spatial planning, integrated land-use planning and integrated coastal management).
- **Improved coordinating mechanisms** are needed to overcome fragmented governance between national administrations, sectors and between terrestrial and marine governance arrangements.
- **Implementation-focused capacity development programmes** should be formulated and disseminated to target land-sea governance practitioners.
- **Filling evidence gaps**, particularly related to the impacts of land-based activities on abiotic coastal resources, should be prioritized and their implications for effective governance determined.

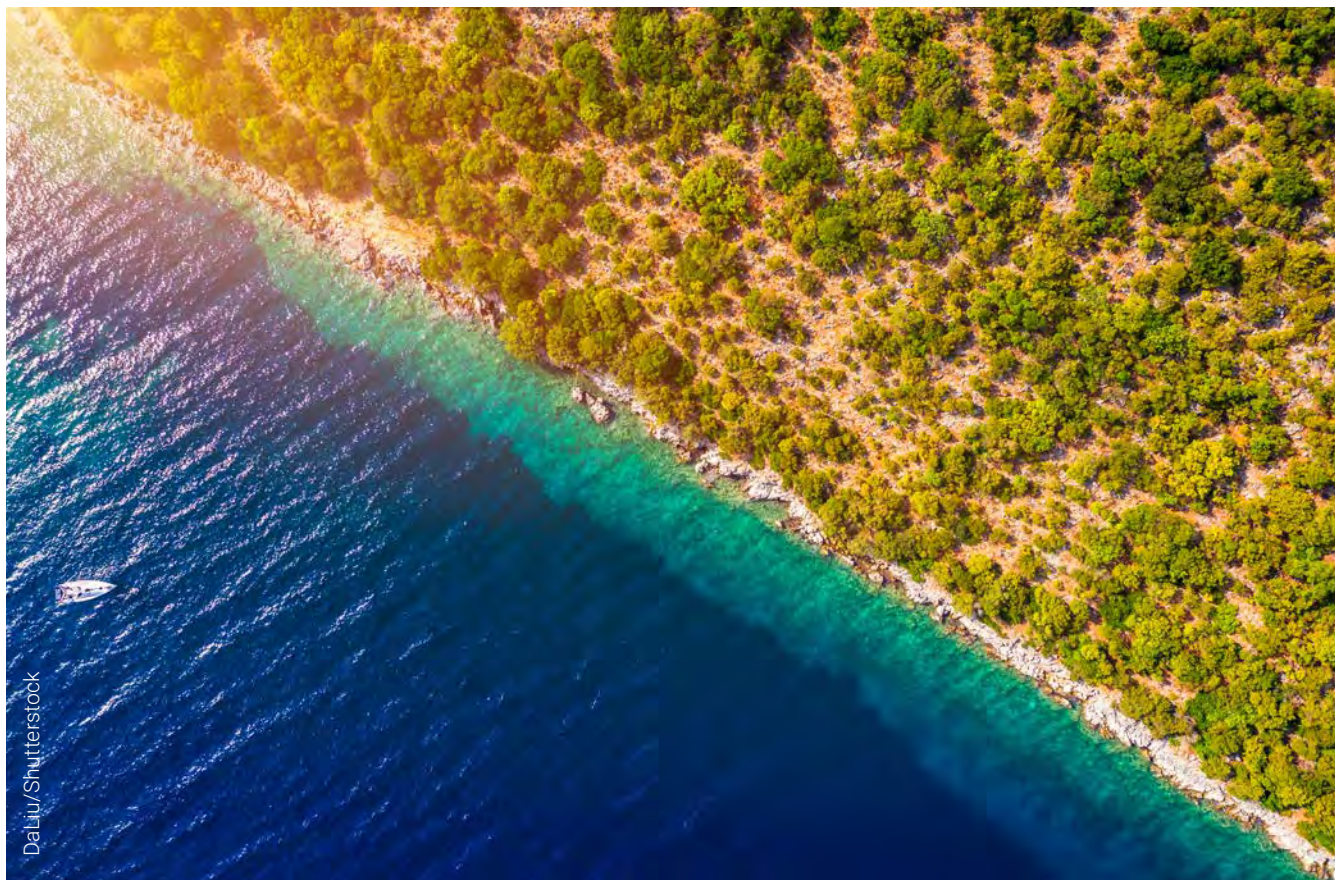
## Options for new governance structures to reduce the impacts of land-based activities on coastal resources and support the transition to a sustainable blue economy.

- **Coastal governance should focus on the pathways connecting multiple land-based activities to coastal resources** and should **not be constrained by arbitrary boundaries** such as legal or administrative ones that disconnect causes from effects and frustrate coordinated governance responses.
- **Regional regulatory frameworks that place a legal obligation on land-based activities** to take account of coastal resource impacts should be developed to reduce the impacts of land-based activities on coastal resources.
- **Natural capital safeguarding on land and at sea is a unifying principle** that could be used as a common cause to connect otherwise fragmented governance systems.
- **Coastal natural capital needs to be mapped and protected**, as there is currently a substantial evidence gap.
- **A stakeholder community must be constructed** to reflect the connections between land-based activities and coastal resources, rather than the typical area-based stakeholder partnerships currently in place.
- **Monitoring and evaluation should focus on impact pathways**, and not merely on the condition of coastal resources.
- **A decision-support tool is required** to support land-sea governance focused on impact pathways that take account of different geographical contexts.

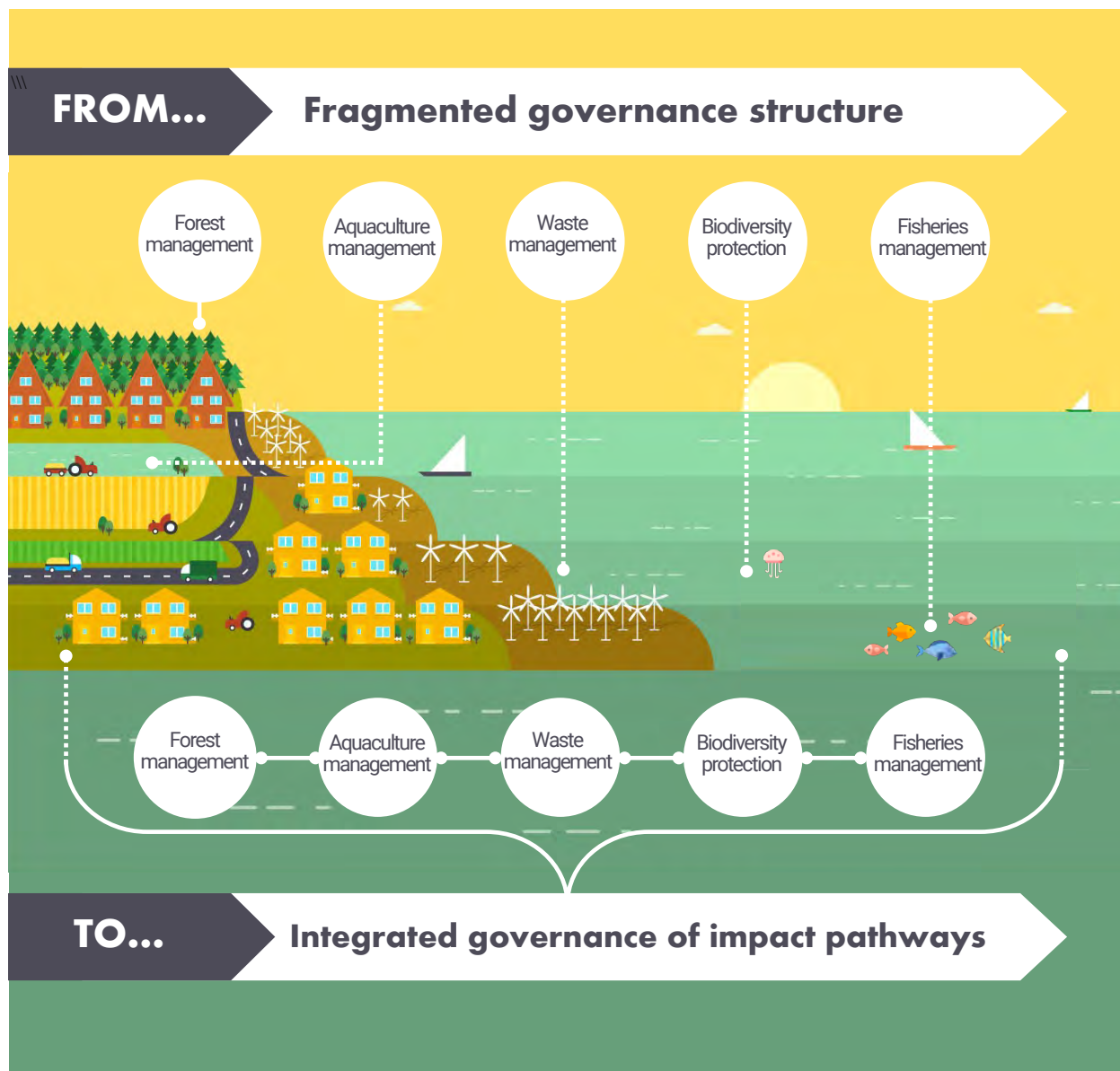


## KEY MESSAGE #5: Tackling the impacts of land-based activities on coastal resources is a global priority

The most impactful land-based activities on coastal resources should be prioritized for urgent action, as these will generate most benefits for the sustainable blue economy most quickly. Given that the impact of any land-based activity on coastal resources, particularly living resources, can vary according to the location, character, condition and resilience of the local ecosystems, each nation could analyze the most impactful land-based activities within their territory. In the global study, these were agriculture, ports and harbors, and aquaculture. The longer-term ambition should be to shift from the current fragmented land-sea governance structures to more integrated approaches that connect all stages of the impact pathway linking land-based activities to their effects on coastal resources.



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**Figure 6.** The transition to integrated coastal governance to reduce the impacts of land-based activities on coastal resources and support the transition to a sustainable blue economy.





# GOVERNING COASTAL RESOURCES

## IMPLICATIONS FOR A SUSTAINABLE BLUE ECONOMY

### Summary for Policymakers

Coastal resources - including fish, minerals and energy - are critical to people, nature and the economy, and are a focus for the emerging sustainable blue economy agenda. It has long been recognized that a particular challenge in coastal areas is the management of land-based activities that generate detrimental impacts on coastal resources in the marine environment. Many of these pressures are negative externalities of land-based human activities that are not taken into account within existing resource-governance frameworks. Therefore, the development of improved approaches to land-sea governance that take account of how land-based activities affect the quality and availability of coastal resources is the focus of this report.

This global study used a Drivers, Pressures, State, Impact, Response (DPSIR) framework to assess how global scale drivers are pushing the development of land-based activities (pressures), which in turn affect the quality and availability (state) of coastal resources. The impact of changing coastal resources on a selection of sustainable blue economy sectors was then considered. Following a review of existing coastal governance approaches that support land-sea coordination, and a detailed evaluation of the governance arrangements in the extractive and aquaculture sectors, the study presents an analysis of possible governance responses that can better account for, and ideally reduce, the effects of land-based activities on coastal resources and thereby support the transition to a sustainable blue economy.



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