STRONG HIGH SEAS

Study on the Socio-Economic Importance of Areas Beyond National Jurisdiction in the Southeast Pacific Region

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Authors

Marcelo Olivares-Arenas, Alternate Director, Institute of Public Policy, Universidad Católica del Norte
Beatriz Yannicelli, Associate Researcher, Núcleo Milenio Ecología y Manejo Sustentable de Islas Oceánicas (ESMOI), Universidad Católica del Norte and CURE, Rocha, Universidad de la Republica, Uruguay
Luis A. Zapata-Padilla, Coastal Marine Coordinator, WWF Colombia
Rodrigo Sfeir, Academic, School of Business Sciences, Universidad Católica del Norte
Gustavo A. Castellanos-Galindo, Marine Programme Consultant, WWF Colombia
Jaime Aburto, Adjunct Researcher, Núcleo Milenio Ecología y Manejo Sustentable de Islas Oceánicas (ESMOI), Universidad Católica del Norte
Ben Boteler, Co-lead STRONG High Seas, Institute for Advanced Sustainability Studies (IASS)
Pablo Guerrero, Director of Marine Conservation, WWF Ecuador

Contributors

Nicolás Rovegno Arrese, Marine Programme Specialist, WWF Peru
Leidy Cuadros, GIS Specialist, WWF Colombia

Design and Layout

Sabine Zentek

Editors

Marcelo Olivares-Arenas, Carole Durussel, Ben Boteler

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Corvette Captain Rafael Hurtado Valdivieso, Head of Economic Affairs Area Colombian Ocean Commission, Colombia

Roberto E. Lastra Mier, Docente Legislación Ambiental, Facultad de Ciencias Jurídicas, Universidad del Atlántico, Colombia

Luis Germán Naranjo, Director of Conservation and Governance, WWF Colombia

Tim Packeiser, Senior Policy Advisor Ocean Governance, WWF Germany

Pradeep Singh, Research Associate, Institute for Advanced Sustainability Studies (IASS)

Claudette Spiteri, Consultant, MCL Environmental Consulting

Dr. César Viteri Mejía, Senior Fisheries Bio-economist, Charles Darwin Research Station

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Abbreviations

ABNJ	Areas Beyond National Jurisdiction
AIS	Automatic Identification System
BBNJ	Biodiversity Beyond National Jurisdiction
CPPS	Permanent Commission for the South Pacific
DOC	Dissolved Organic Carbon
EBSA	Ecologically or Biologically Significant Marine Areas
ECNA	Eastern Coast of North America
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESMOI	Millennium Nucleus - Ocean Island Ecology and Sustainable Management
FAO	Food and Agriculture Organization of the United Nations
GHG	Greenhouse Gases
IATTC	Inter-American Tropical Tuna Commission
IMO	International Maritime Organisation
IOC	International Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
ISA	International Seabed Authority
MARPOL	International Convention for the Prevention of Pollution from Ships
MCP	Microbial Carbon Pump
MGR	Marine Genetic Resources
RDOC	Recalcitrant Dissolved Organic Carbon
SPRFMO	South Pacific Regional Fisheries Management Organisation
TEU	Twenty-foot Equivalent Unit
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCNA	West Coast of North America
WCSA	West Coast of South America
WTO	World Trade Organisation

Key Messages

- Economic activities that depend on biodiversity beyond national jurisdiction (BBNJ) and a healthy ecosystem provide most of the socio-economic value and benefits to the countries of the South Pacific Permanent Commission (Chile, Peru, Ecuador and Colombia) and other distant nations in the Southeast Pacific.
- Specifically in areas outside national jurisdiction, China, Ecuador and Spain obtain most of the fishing revenues. However, to a large extent, the long-distance fleets do not seem to generate profits from their activities according to their fishing activities when looking at satellite records. The activity seems to depend on the transhipment of fish, their unloading in coastal countries for processing, or subsidies and other types of market distortions.
- Fisheries in the Southeast Pacific, especially in the Exclusive Economic Zones (EEZs) of coastal countries, are highly dependent on biological connectivity. Most of the catch is destined for human consumption which creates significant multiplier effects on coastal economies, while there is also a dynamic and diverse export sector in terms of destinations, with a high share in value of shipments sent to the United States and Spain.
- When looking at Areas Beyond National Jurisdiction (ABNJ, there is a large variety of activities, definitions, statistics, and capacity among the countries of the Permanent Commission for the South Pacific (CPPS) as well as between them and more developed countries from beyond the region.
- In relation to non-consumptive activities, ABNJ in the Southeast Pacific contain unique geological and ecosystem characteristics which together with complex oceanographic ocean cycles influence global and regional climate processes.
- Activities that are not directly dependent on ecosystem health, such as shipping and undersea cables, provide important regional benefits in terms of access to markets and information for coastal economies.
- The potential development of new activities in ABNJ depends heavily on access to the necessary capital and knowledge, conditions which in a capitalist context tend to lead to management or governance structures with a small number of powerful actors and highly concentrated markets.
- Economic concentration and misinformation regarding the ocean could weaken participation and thus the representation of institutional arrangements, risking the exclusion of relevant actors, especially at the regional level.
- There are significant uncertainties associated with the evolution of ecosystems in time and space, especially as a result of incomplete knowledge about biological connectivity, feedbacks of natural systems and climate change. This may justify a precautionary approach to developing activities in the Southeast Pacific ABNJ, allowing time for their environmental impacts to be better understood and to increase conservation and capacity building efforts in the region.

1. Introduction

This report aims to assess the contribution to human well-being of current and potential socio-economic activities in marine Areas Beyond National Jurisdiction (ABNJ) in the Southeast Pacific, highlighting human dependence on the ecosystem services that marine Biodiversity in Areas Beyond National Jurisdiction (BBNJ) provides, as well as on those activities that compete with or generate negative effects on it as a consequence of their deployment. The study focuses on the socio-economic aspects that depend on, and interact with, BBNJ in the FAO 87 region, corresponding to the area in front of the jurisdictional areas of Chile, Peru, Ecuador and Colombia (member countries of the Permanent Commission for the South Pacific or CPPS[1]), and in general for the well-being of mankind.

As part of this introduction, a first subsection is presented below to provide context on the importance of marine ecosystems and the relationship of BBNJ to human well-being, followed by a second subsection describing the organisation of this report.

1.1. Biodiversity Beyond National Jurisdiction, ecosystem services and human well-being

ABNJ globally represent 64% of the surface area and 95% of the volume of the oceans, harbouring important species and ecosystems. In particular, the biodiversity in these areas (or BBNJ) corresponds to the existing genetic, species and ecosystem diversity.

Ecosystem services, understood as the multitude of benefits that nature or ecosystems provide to people and society, have been classified in different ways, and a conceptual convergence can be observed over the years. Thus, a broad consensus has emerged that ecosystem services can be classified into four broad categories, namely provisioning services, regulating services, habitat or supporting services, and cultural services (Duraiappah et al., 2005).

Following Sukhdev et al. (2010), provisioning services can be defined as the material or energy products provided by ecosystems; regulating services relate to the capacity of ecosystems to act as a regulating agent of the environment; cultural services relate to the non-material benefits that people derive from their contact with ecosystems, while habitat or support services correspond to the capacity of ecosystems to sustain other ecosystem services.

The relationship between humans and nature and the benefits that can be derived from this relationship are part of a complex and multidimensional system. There is an unequivocal relationship between biodiversity and the provision of many ecosystem services, even contributing to the degree to which nature can respond to critical events and reduce risks and threats to ecosystem services and thus to people's well-being.

1 Intergovernmental body whose mission is ‚to coordinate and promote the maritime policies of Member States for the conservation and responsible use of natural resources and their environment for the benefit of the integral and sustainable development of their peoples'

1.1.1. The importance of ocean ecosystems

Ocean and coastal ecosystems are extremely important in terms of the services and thus the value they generate. More than three-quarters of the planet's animal biomass is found in the marine environment and 15% of the Earth's total biomass is found on its seabed (Bar-On et al., 2018). Moreover, ocean-based industries currently contribute around 31 million jobs, 1.5% of the total, of which fishing, despite its relatively lower value, generates more than a third, while oil and gas extraction activities make the smallest contribution (OECD, 2016). Other studies have described the gross marine product to be at least $2.5 trillion (roughly equivalent to the seventh largest economy), while the ocean's wealth is estimated to be at least $24 trillion, without considering non-consumptive but critical services such as climate regulation and habitat support (Hoegh-Guldberg et al.,. 2015). Similarly, it has recently been estimated that the top 100 companies dependent on the ocean economy generated revenues of $1.9 trillion in 2018 (Virdin et al., 2021). The largest contributor to this revenue was the offshore oil and gas sector (65%), followed by the shipping (12%), shipbuilding and repair (8%), marine equipment and construction (5%), seafood production (4%), cruise tourism (3%) and port activities (2%).

Although marine ecosystems generate a wide range of services and most of them depend on their condition to provide these services, it is ocean ecosystems that have one of the greatest knowledge and governance deficits. The management of marine ecosystems is complicated both by limited understanding and the absence of comprehensive standards for their assessment. A better understanding of the ecosystem services of BBNJ, their contribution to human well-being and thus the assessment of their socio-economic aspects will help to facilitate their management to the extent that it will be possible to understand the impacts of the different activities on relevant biological processes.

It is important to take into consideration that the majority of the population relates to the ocean from the coast and it is there where there is a better identification of the ecosystem services that the sea provides, such as fisheries and tourism. Furthermore, the ocean is an interconnected system from the surface to the seabed and from the coast to the ABNJ, which represent more than 60% of the ocean's surface area and more than 70% of its volume (DOSI, 2020; Rogers et al., 2014).

In addition, ABNJ play a major role in climate regulation and have been generating enormous benefits to humanity, evident since the development of deep-sea navigation; however, recognition and valuation of the services they provide and the biodiversity they harbour is recent and presents particular challenges (Rogers et al., 2014). Especially in the southern hemisphere, where ABNJ are scientifically under-explored and more recently used than in the northern hemisphere. Because of their breadth and depth, the exploration and analysis of natural processes in ABNJ, as well as the exploitation of resources, have been subject to technological development and the coordination of large-scale international efforts.

Technologies for accessing deep-sea mineral resources are already a reality and both surface and deep-sea fishery resources are being exploited with great intensity, while new opportunities for biotechnological development are emerging. There is thus a diversity of current and potential uses, with global implications and asymmetries in relation to the real exploitation capacities of coastal countries, as well as the risks associated with their over-exploitation, or the environmental impacts of underwater mining activities not yet started.

The vast marine space, once considered an inexhaustible source of resources, now presents signs of degradation to biodiversity that could compromise the functions and services that depend on it, generating uncertain and potentially irreversible scenarios of risk, while knowledge is incomplete with only 11% of the species described (Luypaert et al., 2020).

Box 1: INTERNATIONAL OCEAN AGENDAS

In recent years, ocean issues have gained a prominent role in the international agendas and activities of the United Nations in the framework of coordination and action on Environment and Sustainable Development, particularly since 2017, when the first Oceans Conference was held (Oegroseno, 2018). A large number of voluntary commitments were made and „Our Ocean, Our Future: A Call to Action“ (Assembly, U. G., 2018) was drawn up to advance towards the expected achievements of Goal 14 of the Sustainable Development Agenda agreed in 2015: „Conserve and sustainably use the oceans, seas and marine resources for sustainable development“ as well as associated goals. In the same year, the United Nations General Assembly agreed to effectively start negotiations to elaborate a treaty on Biodiversity in Areas Beyond National Jurisdiction under the United Nations Convention on the Law of the Sea (UNCLOS, 1982) following the work of the preparatory commission. The Ocean Action Communities also created, groups made up of various voluntary actors, which monitor the implementation of voluntary commitments, articulate, facilitate and promote actions, each around specific themes (e.g. coral reefs, blue economy, BBNJ, among others) and it is decided to assign to UNESCO the preparation of a ten-year programme for ocean research.

Background

While „the protection of the oceans, all types of seas, including enclosed and semi-enclosed areas and coastal areas, and the protection, rational use and development of their living resources“ was an objective of the first meeting on Environment and Development (Rio, 1992; Agenda 21) and subsequently action plans were proposed (World Summit, Johannesburg 2002), the fact is that by the time of the Rio+20 Summit „The Future We Want“ in 2012, ocean issues were being addressed with delays (Cicin-Sain et al, 2011; Oegroseno, 2018), and the development of a binding legal framework for the ABNJ had been pending since the ratification of UNCLOS in 1982. This situation led the 2012 summit to highlight the need to give it greater priority, involving a greater number and diversity of actors with multiple interests in the area. The emphasis of the 2015 ocean target, however, shows a shift in emphasis towards sustainable use and explicitly introduces the concept of sustainable development, strongly linked to the development of the Blue Economy framework (Pauli, 2010) which has been conceptually embraced as „the way forward“ for framing ocean environment and development actions.

Thus, the relevance of activities, directly or indirectly associated with biodiversity, are beginning to be highlighted for their fundamental role in economic growth and human well-being. Sustainable growth depends to a large extent on the conservation of ocean functions linked to human wellbeing and is based on three axes: greater development of scientific and technological knowledge, strong investment, and a binding institutional framework that addresses areas outside national jurisdictions. Efforts have been made over the last two decades to quantify the wealth that the ocean can provide, with the vision of an investment opportunity, the one hand, but also in relation to how to value biodiversity and the relevance of its conservation.

Action on ocean conservation and sustainability

The scientific and technological development axis is mainly addressed by the United Nations Decade of Ocean Sciences for Sustainable Development program, whose design and preparation is coordinated by the International Oceanographic Commission (IOC), given its role as responsible for the global support of education and research in ocean sciences and services. The Ocean Decade program is aimed at promoting international cooperation to „develop ocean science that is fit for purpose" (deep disciplinary knowledge as well as problem-driven research, connecting ocean science to societal needs) and begins in 2021.2 The financial investment axis is addressed by multiple actors, one program for example is the United Nations Sustainable Blue Finance Initiative: Mobilizing Sustainable Blue Finance Initiative: mobilizing capital for a sustainable ocean. In this axis, institutions with major private participation have implemented programs. The World Economic Forum: Ocean Action Agenda (https://www.weforum.org/agenda/archive/oceans/), World Ocean Forum; The Economist Group World ocean initiative (https://www.woi.economist.com/blue-finance/); World Ocean Council (https://www.oceancouncil. org/): global „blue economy" business organization. Some initiatives look to the ocean as a new frontier of use in the face of the limited availability of terrestrial resources. In terms of governance, the BBNJ negotiations are being developed, which will not overlap in scope with those already being addressed by other institutions (e.g. the International Seabed Authority (ISA) and Regional Fisheries Management Organizations), but will help to further articulate with them. The point of capacity building and technology transfer, for example, will undoubtedly benefit from the UN Decade on Ocean Research. In addition, the work and scope of action of other organizations, such as the World Trade Organization (WTO) has clear links to the future development of the ocean economy (e.g. https://www.wto.org/english/news_e/spra_e/spra276_e.htm) and the United Nations Conference on Trade and Development (https://unctad.org/topic/trade-and-environment/oceans-economy; Will et al., 2020).

Perspectives and challenges

This non-exhaustive summary of the global picture provides an indication of the framework under which both the diversification and intensification of ocean-related activities are being promoted, as well as the involvement of new actors. This indicates that there is an enormous challenge for the countries of the region in relation to ocean planning and policy since, despite recent important advances in ocean governance, there is still a need for a more comprehensive approach to ocean planning and policy (for example Chile's National Ocean Policy), the region's historical role in the implementation of jurisdictional areas, available capacities, and its involvement in ABNJ activities is much later than that of developed countries. These countries have been active over the last decade in assessing their economic development from the ocean, and investing in deep exploration and exploitation technology, among others. Meanwhile, the analysis of the contribution and trade-offs of activities in the adjacent and global ABNJ region to the social, economic, political, and human objectives of the countries of the Permanent Commission for the South Pacific (CPPS), and their link to the treaty under negotiation, has not, to our knowledge, been comprehensively addressed. It is envisaged that developments in relation to the oceans in this decade will have a high impact on societiy through the environmental „state", but also through innovation processes, access conditions, governance, direct investment and potentially in a structural way on the economies of coastal countries.

2 For more information visit https://www.oceandecade.org.

1.1.2. Biodiversity, well-being and uncertainty

The benefits that ABNJ provide to human well-being emerge from two ways in which BBNJ helps to create socio-economic value, shown in an adaptation of Bartkowski (2017) in Figure 1.

The first way includes the socio-economic benefits from BBNJ and other ecosystems that depend on it (in green). These benefits are created through complex ecological and physio-chemical functions that generate ecosystem services, as well as contribute to the habitat of migratory species and, through ecological connectivity, to ecosystem services in the Exclusive Economic Zones (EEZs) of coastal countries (dotted line in Figure 1). These benefits can be consumptive, such as fisheries, or non-consumptive but essential to human existence, such as climate regulation, habitat support, cultural identity and the advancement of knowledge.

In the second group are economic activities that are not directly dependent on the BBNJ or abiotic (in orange), but which share space and generate a negative effect on the BBNJ (and coastal zones), such as shipping and underwater mining, and thus on the capacity of ecosystems to provide and sustain ecosystem services over time.

Economic activities in both groups, in both development and implementation phases, are subject to different factors that mediate ecosystem health, human well-being and their distribution, such as technological progress, capital endowment and the economic structure of related industries, relationships between power groups, institutional development and access to public information (Fedele, 2017; Browman et al., 2005; Su et al., 2016; Jefferson et al., 2015). These elements can create unequal trajectories of development and uncertainty for actors regarding access to and the capacity of BBNJ to provide services in the future, as well as influencing the evolution of preferences and consequently their option value, i.e. the value of the possibility that elements (or features) of ocean ecosystems may not be used today as sources of well-being, but may be in the future.

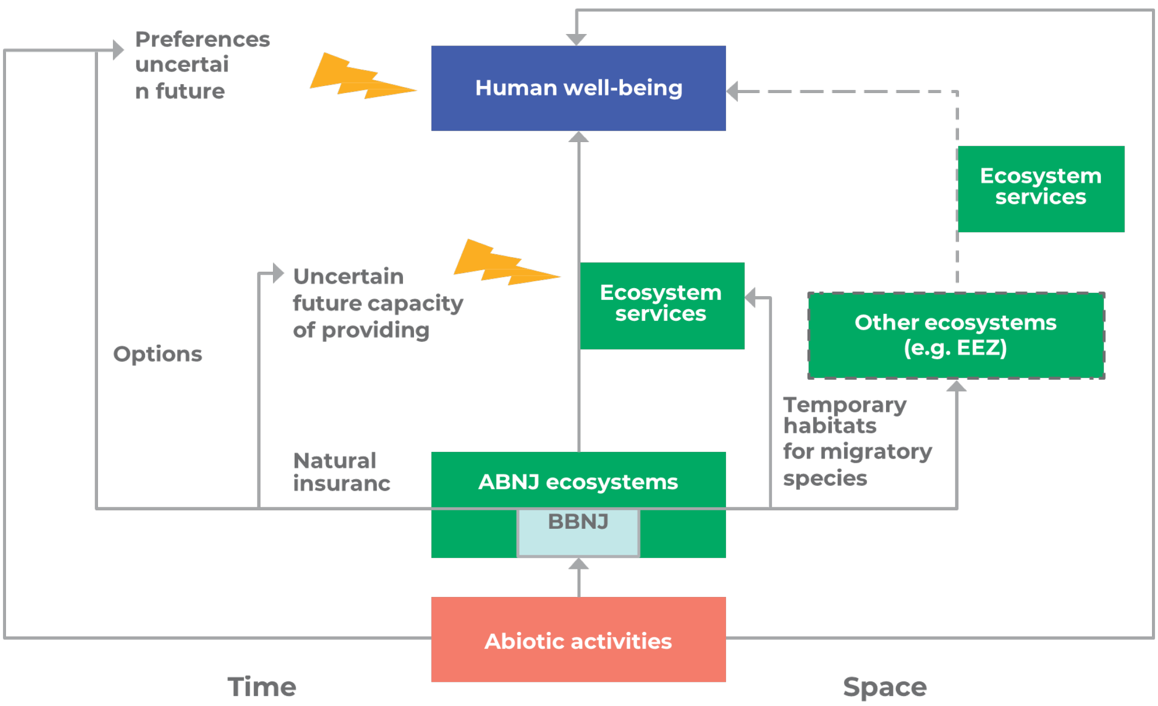

Figure 1: Biodiversity Beyond National Jurisdiction and its value for human well-being Adapted from Bartowski (2017)

In this way and through different functions, BBNJ contributes to human's well-being and thus generate economic value, which varies according to advances in knowledge, and different spatial and temporal scales (Isbell et al., 2017; Bartkowski, 2017; Paul et al., 2020; Thurber et al., 2014). Thus, the economic value of BBNJ goes beyond an administrative delimitation and transcends to other ecosystems and the planet, because of the public characteristics of the services it generates, which varies depending on uncertainty in the face of global change, ongoing institutional processes, and the rapid advancement of scientific knowledge and technological development about the oceans (Drakou et al., 2017; Bebbington et al, 2019; Yadav and Gjerde, 2020), elements that challenge the simplifying assumptions of a traditional cost-benefit assessment (Groeneveld, 2020).

1.2. About this report

This report offers a review of activities that contribute to human well-being including those that are dependent on and/or impact marine biodiversity in ABNJ of the Southeast Pacific. In addition, a discussion on the distribution of socio-economic costs and benefits of these activities, as well as their sustainable management considering the 2030 Agenda and BBNJ agreement is provided.

The structure of this report considers both the ecosystem services provided by BBNJ and the economic activities which currently use these services or could be developed in the future, as in the case of mining. In this regard, Chapter 2 addresses the ecosystem services associated with consumptive activities by distinguishing between those that are biotic, such as provisioning services from fisheries and marine genetic resources, and those that are abiotic, such as deep sea mining and hydrocarbon extraction.

Chapter 3 is devoted to ecosystem services and non-consumptive activities, such as regulating and sustaining services (waste disposal and circulation, climate regulation, carbon sequestration and storage), supporting services (biodiversity and habitat conservation) and cultural services (knowledge generation, recreation and tourism, inspiration and spirituality).

Chapter 4 discusses some of the activities, such as shipping, undersea cables, illegal activities, and maritime security, that take place in ABNJ and do not depend on ecosystem services but may affect marine biodiversity and thus its capacity to provide services.

Chapter 5 discusses the benefits derived from ABNJ activities, their relationship with biodiversity, and the uncertainties and socio-economic distribution of costs and benefits. Chapter 6 presents a synthesis of the effects and contribution of the BBNJ agreement to sustainable management and the 2030 Agenda for Sustainable Development.

The ABNJ of the Southeast Pacific are highly heterogeneous in terms of available information (e.g. the South Pacific Ocean Gyre[3] is one of the least studied ocean sites in the world) as well as in the level of development and sectoral activities. For this reason, the assessment presented here quantitatively discusses sectors such as fisheries, while descriptively discussing the uncertainties and potentials of other sectors and ecosystem services on the basis of available information. As an underexplored area, the region offers a window of opportunity for scientific and technological discovery and development, especially for the countries of the region.

Table 1 below summarises the activities present or with potential for development in the ABNJ of the Southeast Pacific, differentiating between consumptive and non-consumptive activities as well as other activities that do not depend on the BBNJ but have an impact on it. The table also complements the structure of this report.

3 The South Pacific Ocean Gyre is one of 5 rotating ocean current systems associated with the rotational motion of the Earth.

Table 1: Ecosystem services and activities in ABNJ of the Southeast Pacific considered in this report.

Ecosystem service	Types	Socio-economic interests	This report
Consumptive activities			
Provisioning (biotic)	↗ Nutritional	Fisheries	Established economic sector (paragraphs 2.1.1 - 2.1.3)
	↗ Nutritional	Mariculture/aquaculture	Does not occur in ABNJ
	↗ Diverse applications of marine genetic resources	Marine genetic resources, pharmaceuticals	Emerging economic sector (section 2.1.4)
Provisioning (abiotic or independent of ecosystem state)	↗ Raw materials	Deep-sea mining	Emerging economic sector (section 2.2.1)
	↗ Raw materials/energy	Oil and gas	It does not (yet) occur in ABNJs, but could impact them.
Non-consumptive actitvities			
Regulation and Maintenance	↗ Mediation of physical, chemical and biological conditions	Climate regulation	Sections 3.1.1 - 3.1.2
		Carbon sequestration and storage	Sections 3.1.1 - 3.1.2
	↗ Mediation of flows	Water circulation	Sections 3.1.1 - 3.1.2
	↗ Mediation of toxic and other wastes	Waste disposal (from off-shore, e.g. shipping, and transported from land-based sources	Section 3.1.3
Supporting	↗ Biodiversity	Management and conservation BBNJ	Section 3.2
	↗ Habitat for species	Management and conservation BBNJ	Section 3.2
Cultural	↗ Recreation and leisure	Recreation, leisure and tourism	Section 3.3.1
	↗ Research	Research and education	Section 3.3.2
	↗ Spiritual, symbolic and other interactions with biota and ecosystems	Spiritual, symbolic and other interactions with biota and ecosystems	Section 3.3.1
Other activities independent of ecosystem state		Maritime transport	Section 4.1
		Submarine cables	Section 4.2
		Illegal activities	Section 4.3

2. Ecosystem services and consumptive activities in areas beyond national jurisdiction

Provisioning services correspond to the set of material or energetic products provided by ecosystems, and among the various ecosystem services they are the easiest to recognise. Raw materials, food, minerals and fuel, genetic resources, and the production of biochemicals and pharmaceuticals are some examples of provisioning services that ABNJs provide or could provide.

Fishing is undoubtedly the most recognised activity with respect to these services in the ABNJ of the Southeast Pacific. It provides inputs for production and seafood consumption, which generates direct and indirect economic benefits in the form of food, employment and the development of complementary industries in the population of the region and other countries.

Given the trans-oceanic and migratory nature of many of the species that support (considering different ecological roles) or are incidentally caught in these fisheries, the way they are managed will determine the impacts that may be generated not only on ABNJ ecosystems, but also on adjacent exclusive economic zones (EEZs) and their respective coastal communities.

2.1. Biotic provisioning services

2.1.1. Fishing activity in the ABNJ in the Southeast Pacific

Fishing activity in the ABNJ areas of the world is dominated by pelagic fishing and a small number of actors (Carmine et al., 2020), with higher-income countries[4] accounting for 97% of traceable fishing effort in these areas, and a strong presence in the jurisdictional areas of lower-income countries, accounting for up to 78% of industrial fishing activity in these areas globally (McCauley et al., 2018).

In the case of ABNJs in the Southeast Pacific there is an important level of biological connectivity, so the species caught are highly migratory and their life cycle is spans over wide geographical ranges, either involving trans-oceanic migrations in longitude or latitude as in the case of tunas (Popova et al., 2019), or coast-ocean as in the case of jack mackerel (Gerlotto et al., 2012), spanning inside (EEZs) and outside (ABNJs) jurisdictional areas.

As stated in the ecological baseline report of the STRONG High Seas project (Boteler et al., 2019), the greatest biological richness and consequently where most of the fishing activity in the region is concentrated is around the Pacific upwelling and seamounts, with a significant part of the fishing effort carried out off the jurisdictional areas of Peru and Ecuador (Figure 2.). The largest revenues obtained from the Southeast Pacific ABNJs are by the Chinese fishing fleets and the Ecuadorian tuna fleet according to estimates by Sala et al. (2018) and based on activity reported by automatic identification systems (Figure 3).

4 The authors consider as such those countries in the „high-income“ and „upper middle-income“ categories (which include China) as defined by the World Bank.

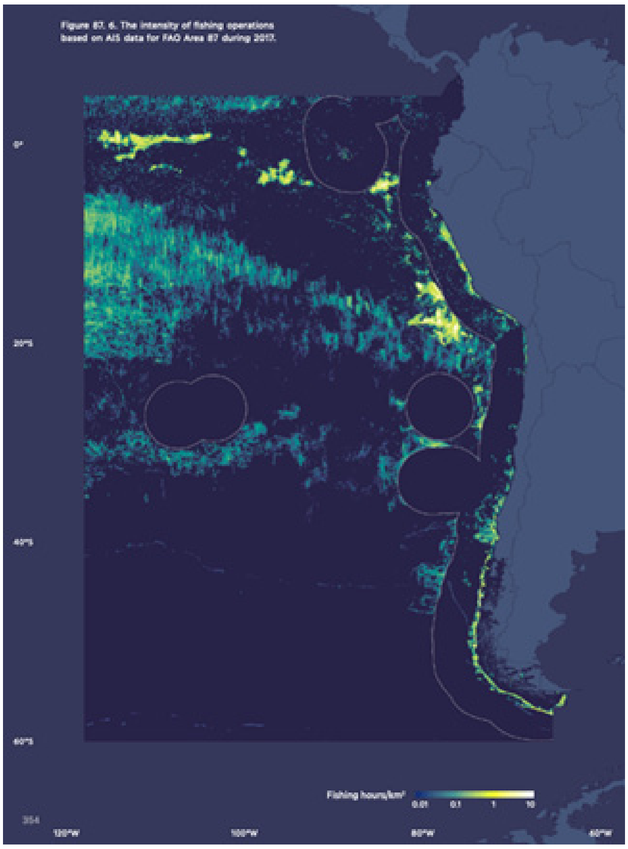

Figure 2: Intensity of fishing operations based on AIS for FAO Area 87 during 2017 (Grande et al., 2019)

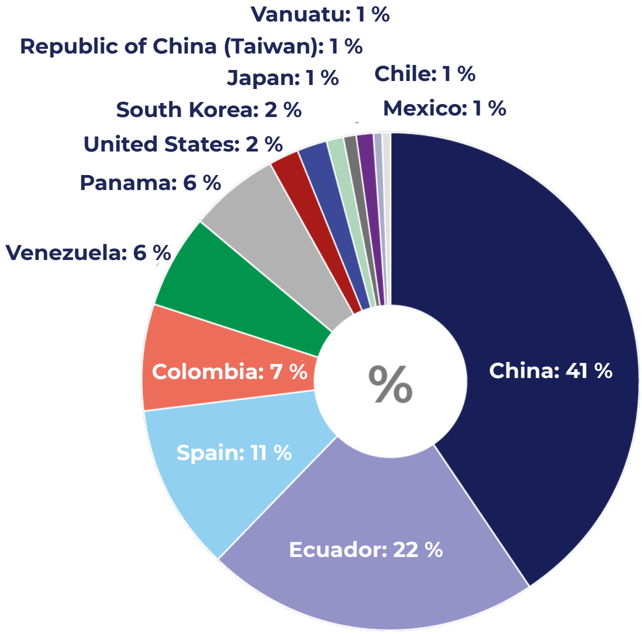

Figure 3: Estimated revenues from fishing acti vity in ABNJ based on the AIS (Sala et al., 2018)

Globally, fishing activity in the ABNJ has been carried out to a large extent under dynamics that are contrary to efficient exploitation of natural resources, as a result of information asymmetries, illegal practices and the existence of subsidies that support the long-distance fishing industry (Sumaila, 2010; Arthur et al., 2019). In the region, although there is a significant presence of the Ecuadorian fleet exploiting the area off its EEZ, Sala et al. (2018) estimate that a large part of the fishing activities carried out by long-distance operations, mainly by China, Japan, South Korea and Taiwan,[5] would generate losses in the absence of heavy subsidies, possible illegal practices such as operating in the jurisdictional areas of coastal countries or questionable working conditions.

Currently, to move towards sustainable use of the region's fisheries, five resources taken from the high seas are under management measures agreed by the South Pacific Regional Fisheries Management Organisation (SPRFMO[6]), which keeps a register of authorised vessels, and establishes observation, reporting and transshipment protocols specific to each resource. While fishe-

5 The official names of the countries (followed by the abbreviated forms in brackets) are: People's Republic of China (China); Republic of Ecuador (Ecuador); Kingdom of Spain (Spain); Republic of Colombia (Colombia); Bolivarian Republic of Venezuela (Venezuela); Republic of Panama (Panama); United States of America (United States); Republic of Korea (South Korea); State of Japan (Japan); Republic of Vanuatu (Vanuatu); Republic of China (Taiwan); Republic of Chile (Chile); United Mexican States (Mexico). For the sake of brevity, only the abbreviated forms are used in the text.

6 Species under management measures are Chilean horse mackerel (Trachurus murphyi), giant squid (Dosidicus gigas), orange roughy (Hoplostelthus atlanticus), alfonsino bream (Beryx splendens) and Antarctic rufous (Beryx splendens). For more information see https://www.sprfmo.int

ries management and conservation of tuna and other highly migratory resources in the Eastern Pacific is under the Inter-American Tropical Tuna Commission (IATTC https:// www.iattc.org/ HomeSPN.htm).

2.1.2. Connectivity and fisheries of migratory species in the area FAO 87

When analysing the dependence of fisheries in the BBNJ region, it is necessary to consider their productivity both outside and within areas of national jurisdiction, especially in a context where globally catches of migratory species have declined the most (Juliano-Palacios, 2020). The following briefly discusses the catches of those species that inhabit, migrate or depend on the ABNJ of the FAO 87 region in the Southeast Pacific, regardless of whether they are caught within or outside areas of jurisdiction, given the high oceanic connectivity and the impact of such biodiversity on the benefits of the fisheries sector of the CPPS countries.

According to official data reported by the Food and Agriculture Organization of the United Nations (FAO), in 2018 the total catch of species present in the ABNJ and therefore dependent on their biodiversity in the Southeast Pacific reached 2,301,519[7] tonnes, led by Peru with 32.1% of the total, followed by Chile with 30.3%, other countries with 30.3% - mainly China - with 21.7%, while Ecuador reached 14.93%. In the case of Ecuador, approximately 70% of its catches are taken in the ABNJ, in contrast to the rest of the CPPS countries, the vast majority of catches are taken within national waters (Sea Around Us, 2014; Sala et al., 2018).

In relation to the species exploited (Figure 4), the giant squid (Dosidicus gigas) in 2018 with 895,290 tonnes, representing 38.9% of the total volume of catches in the region, half the total catch volume of Peru and 21% of Chile. In both cases, the activity is one of the main resources that sustain artisanal fishing, with a fleet of at least 4,500 vessels in the case of Peru (Instituto del Mar del Perú, 2018), where it is estimated that the activity generates the highest profit margins in the country‘s fishing sector (Christensen et al., 2014). On the other hand, in 2019, Chile has legislated the closure of the giant squid fishery to industrial activity (Law N°21.134). Despite the importance of this fishery for the artisanal sector and its unusual operation outside jurisdictional waters (Csirke et al., 2018), there is concern in the Peruvian case about the increase in fishing effort and the decrease in efficiency (De la Puente, 2020). At the same time, almost 40% of the 346,200 tonnes of official catches for 2018 of giant squid for the Southeast Pacific were taken by the Chinese long-distance fleet, which could also benefit from the spillover effects of the closure of the fishery to the Chilean industrial fleet in its national waters.

In second place in terms of the volume of landings of migratory species in 2018 is the jack mackerel (Trachurus murphi) with 542,896 tonnes and 24% of the total volume. It is mainly caught by Chile with 81.9% of the catches, mostly within its jurisdiction, and to a lesser extent by Peru (10.7%) and China (4.5%). However, its distribution range is wide and catches are made to a lesser extent in ABNJ (Sea Around Us, 2014), while the reproductive areas of jack mackerel have been located precisely on the high seas (Gerlotto and Dioses, 2013).

7 The total number of species considered in the data presented considers all those species present in the ABNJs of FAO area 87 of the Southeast Pacific and which recorded catches of more than 1,000 tonnes per year.

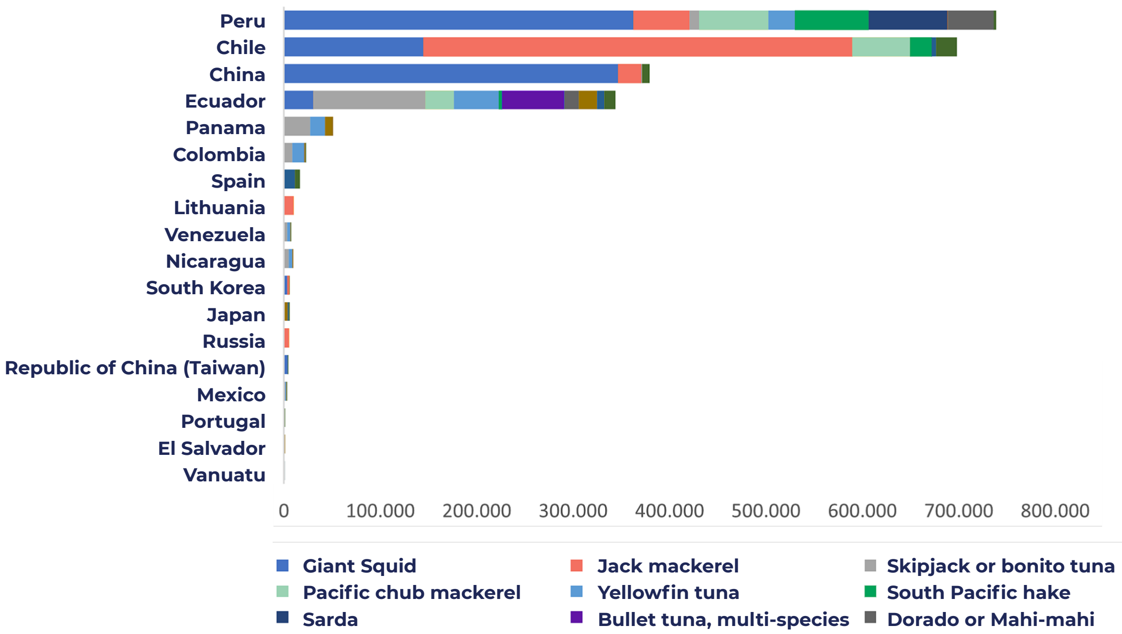

Figure 4: Catches in tonnes of aquatic species present in ABNJ in the FAO 87 region by flag, year 2018. Own elaboration based on data from FishStatJ, FAO.[8]

In the 1990s and the first decade of the 2000s, Chilean jack mackerel landings were mainly destined for fishmeal, while the accelerated industrial development of the activity led to the collapse of this fishery (Rosenblum and Cabra, 2012). This was a major socio-economic crisis as well as resulted in serious environmental damage in various bays in Chile, the most extreme case being that of the city of Talcahuano, which was declared a saturated zone (Quiroga and Von Hauwermeiren, 1996). However, since the establishment of the SRPFMO in 2012 and with it conservation and management measures, as well as a greater focus on value addition, it has been possible to recover and increase jack mackerel extraction quotas for Chile over the last decade and to achieve that currently 80% of the landings from the Chilean jack mackerel fishery are destined for direct human consumption (canned, frozen and smoked). Moreover this fishery has been certified by the Marine Stewardship Council (MSC) since 2019, a sign of progress towards sustainable management measures, making jack mackerel the largest certified fishery in Latin America.

The third group of relevant migratory fisheries, especially due to their higher commercial value, is tuna. Catches of skipjack or bonito tuna (Katsuwonus pelamis) with 172,698 tonnes and yellowfin tuna (Thunnus albacares) with 110,760 tonnes species that contributed to more than half of Ecuador's landings in 2018; a country that is not only the most relevant player with respect to these fisheries in the region, but also globally, ranking sixth for the total catch of yellowfin, bigeye and skipjack (McKinney et al., 2020).

8 The official names of the countries (followed by the abbreviated forms in brackets) are: Republic of Peru (Peru); Republic of Lithuania (Lithuania); Republic of Nicaragua (Nicaragua); Russian Federation (Russia); Portuguese Republic (Portugal); Republic of El Salvador (El Salvador). The official names of the other countries in the figure have already been specified above. For the sake of brevity, only the abbreviated forms are used in the text.

According to the Ecuadorian Chamber of Tuna Industrialists and Processors, the installed tuna processing capacity in Ecuador, in its different presentations, i.e. pre-cooked loins, canned tuna and pouch[9], is estimated at 450,000 tonnes per year. The tuna sector in general in Ecuador employs approximately 10,000 people in the extractive phase and 21,000 in the processing phase[10], of which 60% are women (Cámara Nacional de Pesquerías del Ecuador, 2016). In addition, it should be noted that large pelagic species such as tuna, billfish and dorado account for most of the fishing effort of the Ecuadorian artisanal fleet (Martinez-Ortiz et al 2015).

Additionally, in Ecuador there are special customs regimes (for industrial warehouses and maquilas), which allow vessels flying foreign flags to unload their product to national industrial plants for processing and subsequent export as an Ecuadorian product. Under the special regimes (see Box 2), the tuna plants are not required to nationalise the fisheries products and are exempted from paying customs duties temporarily until exportation. The Ecuador Undersecretariat of Fisheries Resources estimates that on average approximately the same amount is processed in Ecuador as the additional catch from vessels with foreign flags (approximately 200,000 tons of whole tuna per year). This is either under a partnership contract with Ecuadorian processors or by importing from reefer vessels from other countries.

Another important fishery is that of dorado, perico or mahi mahi (Coryphaena hippurus), a migratory epipelagic fish that can be found in all tropical and subtropical regions of the world, but with the largest catches generated in the eastern Pacific where it represents one of the main resources of the small-scale fishery, especially in Peru and Ecuador, where it is destined for local consumption and to a lesser extent for export (Aires-da-Silva et al. 2016). In Peru, a conservative estimate of the number of fishers involved in this fishery may be around 10,000, while the value it generates per year could reach around 200 million dollars (Amorós et al. 2017).

The tuna industry is an industry that moves from one country to another for tariff preferences, cheap labour, legal frameworks that stimulate investment, support services for the operation, etc. However, in the Ecuadorian case, investment is mainly national capital. For developing countries, subsidies represent a way of being competitive in international trade, since most of the volume captured (and of better quality) is for export.

9 Tuna in pouch or flexible packaging
10 Presentation by the National Chamber of Fisheries (2016). Available at https://camaradepesqueria.ec/wp-content/ uploads/2016/03/ECUADOR-A-TUNA-LEADER.pdf

Box 2: THE DEVELOPMENT OF THE TUNA CANNING INDUSTRY IN ECUADOR.

Since the 1960s, the production, demand and market for canned tuna has increased very rapidly, hand in hand with the rapid development of tuna purse seine fishing in tropical waters.

The largest consumer of canned tuna in the 1970s was the United States, which has been displaced in recent decades by the European Union. Another important change came about because of the relocation of tuna processing factories from developed countries to sites closer to where the raw material is harvested. This situation also helped the industry, which saw considerable reductions in labour and transshipment costs, and facilitated greater flexibility in the export and marketing of products. By the late 1990s as a result of the development of new forms of product packaging (loins), Thailand became the leading producer of canned products, followed by Ecuador (Miyake et al., 2010).

In 2018, Ecuador exported around 174,000 tonnes of canned tuna and 48,000 tonnes of pre-cooked loins, making it the second largest exporter in the world. Ecuador‘s growth over the last 5 years has been sustained. Factors that have contributed to this growth are among others:

1. Opening to foreign investment that brought in knowledge on issues related to fleet and plant management. This facilitated the arrival of experienced strategic partners, who introduced new fishing technology, modern vessels, value-added products, and increased international trade.
2. Legal framework that allowed for partnership schemes, chartering and transfers of carrying capacities. This made it attractive for shipowners to develop deep-sea fisheries that guarantee the supply of processing plants.
3. Development of specialised logistics for landing and maintenance of tuna vessels. A specialised landing infrastructure was created which included good fishing facilities for the unloading of frozen product, dedicated and highly specialised logistic services (e.g. unloading crews, maintenance and sale of mechanical spare parts, maintenance of nets and electronic fishing aids).
4. Tax incentives to produce and market fisheries products, such as no tariffs for imported raw materials, drawback, and access to public and private bank credits.
5. Compliance with international standards of origin, quality and combating illegal, unreported and unregulated (IUU) fishing, accompanied by the strengthening of public entities to support processes and an increase in trade management capacity in the main markets.

2.1.3. Export and economic effects of fisheries

In addition to the importance for the domestic market and the consumption of coastal countries, the supply of fish generated by the BBNJ supports a dynamic export sector that during 2018 reached shipments of 2,927 million dollars[11]. Exports are well diversified in relation to their destinations as summarised in Figure 5 which summarises the value of shipments by species and final product, with Spain (18.9%), the United States (18.4%), and the Republic of Korea (6.2%) as the main trading partners, with the highest total value accounted for by shipments of skipjack or bonito tuna in preparations from Ecuador. In second place, in terms of relative value, are the exports of giant squid by Peru (US$624 million) and to a lesser extent Chile (US$196 million), which is exported frozen and also pre-prepared. Other species of relevance in terms of their value within the export basket that depends on the BBNJ are swordfish and horse mackerel, which are mainly exported frozen from Chile to multiple destinations.

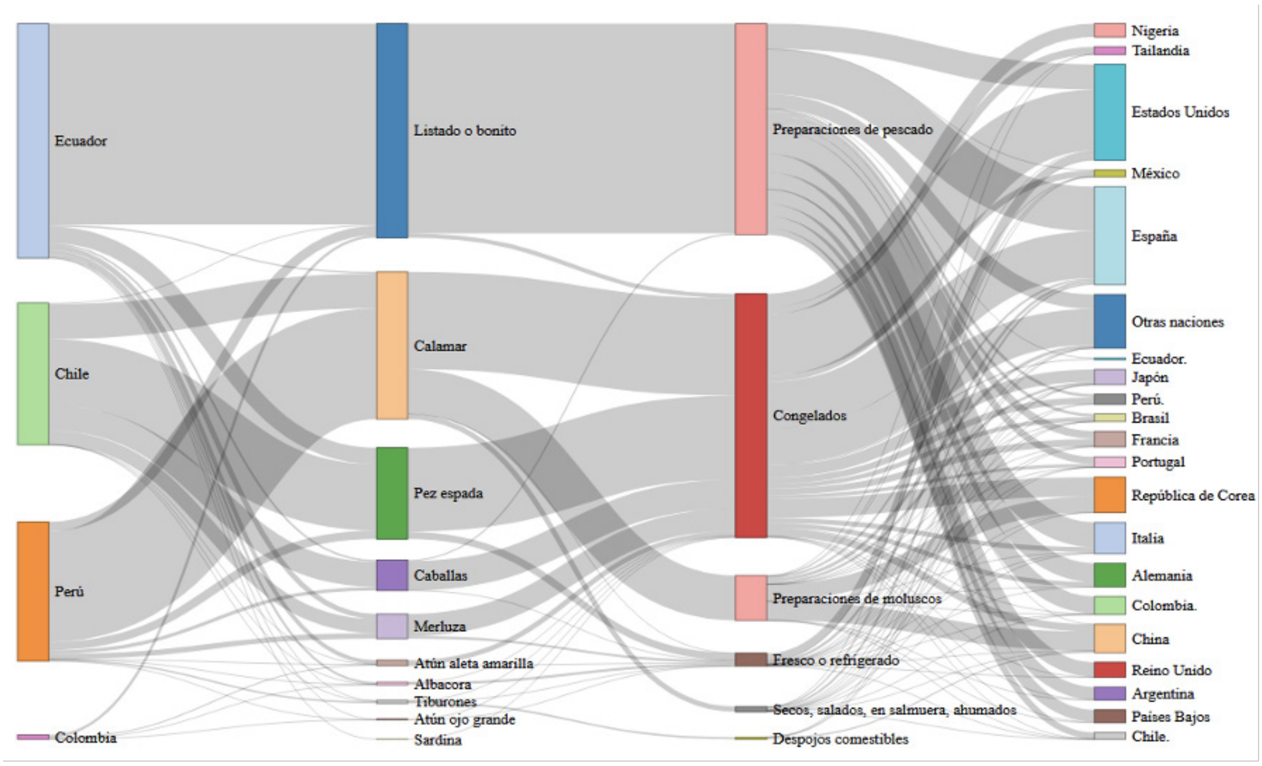

Figure 5: Value of exports of countries belonging to the CPPS, according to group of oceanic species in the FAO 87 region, final product and destination, 2018. Prepared by the authors based on statistics from the United Nations COMTRADE platform.[12]

11 The value of exports corresponds to the sum of the list of tariff codes of the international harmonised system that include in their detail the species identified as present in the ABNJ of the Southeast Pacific. The source of the statistics used is the United Nations COMTRADE platform, available at https://comtrade.un.org/.

12 The official names of the countries (followed by the abbreviated forms in brackets) are: Federal Republic of Nigeria (Nigeria); Kingdom of Thailand (Thailand); Federative Republic of Brazil (Brazil); French Republic (France); Italian Republic (Italy); Federal Republic of Germany (Germany); United Kingdom of Great Britain and Northern Ireland (United Kingdom); Argentine Republic (Argentina); Kingdom of the Netherlands (Netherlands). The official names of the other countries in the figure have already been specified above. For the sake of brevity, only the abbreviated forms are used in the text.

As indicated above, most of the catches of species found in or migrating through the ABNJs of the Southeast Pacific are destined for direct human consumption (Sea Around Us, 2014), being important resources for national long-distance, industrial and artisanal fisheries, and in the protein intake of the population of the CPPS countries and the rest of the world. In addition, both local consumption and export activities generate direct and indirect economic effects in the region that go beyond the value of the landings, because of the added value of the catches across the various production chains that fishing activity generates (Cai et al., 2019). These include those related to storage and logistical support activities, processing, marketing, and commercialisation of final products, as well as backward linkages such as activities associated with the construction and maintenance of the fishing fleet.

For example, globally, the final consumer value of skipjack or yellowfin tuna catches can be up to five times their landing value (MacFayden et al., 2016). Additionally, Christensen et al. (2014) in an effort to value the contribution of the Peruvian fisheries sector to the Peruvian economy estimated that for every dollar landed from large pelagics, its contribution to gross domestic product was $3.2, while for every job in the fleet associated with this type of fishery, 1.5 additional jobs were generated in the economy. The authors conclude by highlighting the greater economic impact of fishing for local human consumption on the Peruvian economy, and obtain estimates of the overall production multiplier of the fisheries sector for Peru of around 3, in line with previous estimates for Latin America (Dyck and Sumaila, 2010).

Notwithstanding the above, there is little reporting of statistics that would allow a systematic analysis of the contribution of the fisheries sector. The sector is not reported as such in production and employment statistics (national accounts), but rather as part of the primary sector, which makes it difficult to make it visible and to take it into account in national development agendas. By way of example, despite having more than 80,000 kilometres of coastline, the first and only fisheries assessment in Chile was published in 2009.

Another relevant point when estimating contributions to the regional economy is related to their distribution, as it is difficult to understand the participation and origin of national and long-distance capital in the fishing industries, and thus the final beneficiaries, which is relevant in the evaluation of subsidies and royalties. In addition, there is a risk that the concentration and economic power of the industrial sector will permeate the institutional processes of the countries, based on corruption, as was the case of legislative interventionism in the drafting of Chile‘s industrial fishing law in 2012 (Backen, 2016), which was recently annulled. This intervention of powerful sectors in fisheries policy and decision-making would end up affecting the most vulnerable actors in the fishing industries of countries in the region (e.g. small-scale fishers and fisheries).

2.1.4. Marine genetic resources: economic considerations

Marine genetic resources (MGRs) are the genetic material of aquatic biota in ecosystems that could be potentially useful to humans, such as for medicines and pharmaceuticals, among others (De Groot et al., 2012). The genetic diversity of species, populations and ecosystems is not considered a genetic resource but an element within the concept of biodiversity. Biodiversity can be affected by different activities and is the key to evolution[13] of life.

13 Evolutionary fitness is defined as the capacity of a system for adaptive evolution. Evolutionary capacity is the ability of a population of organisms to not only generate genetic diversity, but to generate adaptive genetic diversity, and thus evolve through natural selection (Wikipedia).

Unlike fishery resources, to obtain genetic material, a sample of only one species is required and its supply value is mainly commercial with respect to the products developed from its current or future applications. This implies different risk scenarios, returns on investment depending on their applications and timelines that can exceed two decades, which is why patenting procedures are central (Blasiak et al., 2020). These dynamics together with the potential markets for the developments are summarised in Figure 6.

The research and development of MGRs considers applications ranging from the development of chemical compounds and enzymes for industrial uses (processing of harmful elements in effluents, energy generation in bioreactors), the development of biomining, obtaining sequences for food bioengineering, cosmetics, nutraceuticals, pharmaceuticals, and research into medical applications, such as anti-carcinogenic properties, among others (Leary et al., 2009; Imhoff, Labes and Wiese, 2011). With this great potential for development, and although research capacities exist in some universities in CPPS countries, the scaling up and development of biotechnology companies has not been pursued by states or of national private interest and, consequently, patenting occurs mainly abroad.

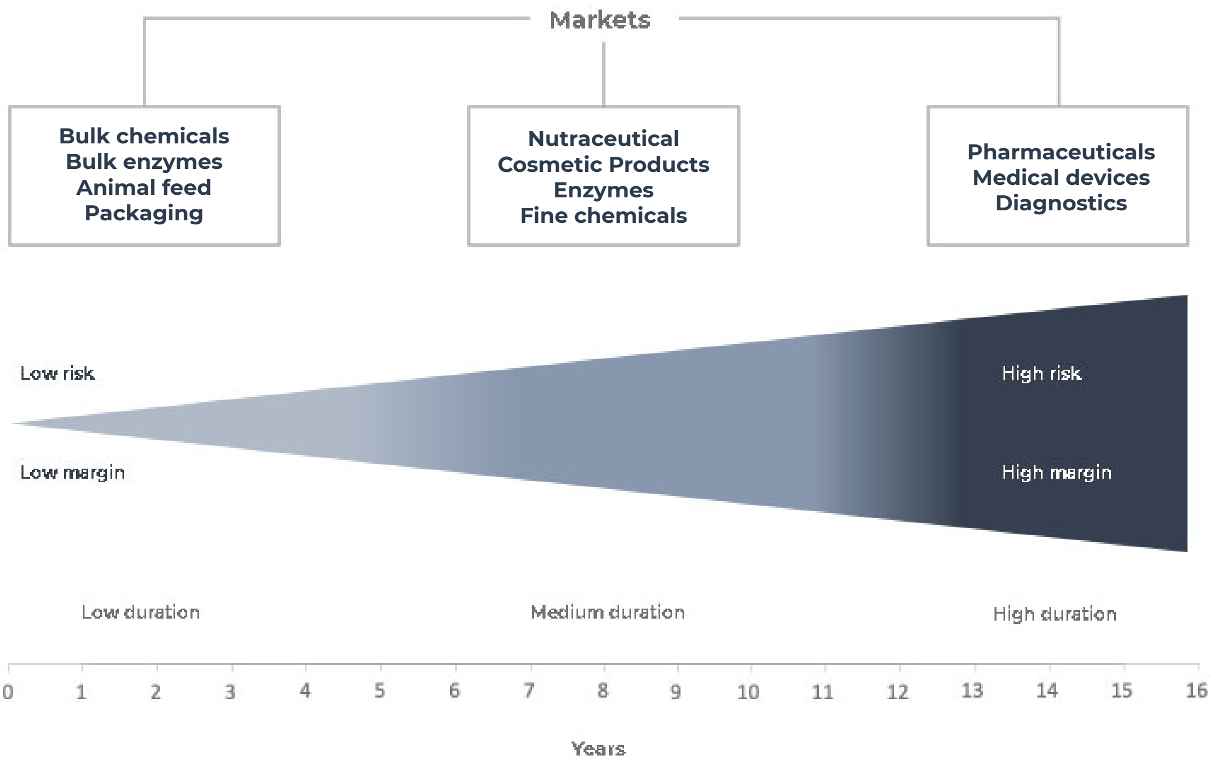

Figure 6: Risk, profit margins and timelines for the development of commercial activities based on marine genetic resources (Blasiak et al., 2020)

In addition, given that the processes of mitigating greenhouse gas emissions or even capturing them could depend on metabolisms encoded in marine organisms, there is the potential to explore the role of MGRs to help address the climate crisis. This would generate global benefits, as well as distributive effects for countries with a share of ownership in such technologies, deepening the already existing inequalities of wealth creation. This is why during the third decade of the millennium, the transfer of skills and technology to developing countries should take a different perspective from previous experiences, considering the global and common scope of the benefits of BBNJ.

Notwithstanding the growing interest in and reference to marine organisms, most of the current scientific activity and value of the products generated comes from material obtained from areas within national jurisdictions, with initiatives heavily focused on the United States and Europe (Oldham et al., 2014; Collins et al., 2021). Even scarcer are those records and developments specifically from ABNJ genetic resources, as Rabone et al. (2019) report that the share of data coming exclusively from outside national jurisdictions is less than 3% (and barely 4% of the data from ABNJ species) of the records in the Ocean Data and Information System[14]. This is largely due to the difficult access to these areas and the high genetic richness already existing within the jurisdictional areas.

In addition, there is a notable difference in capacity in the region compared to northern countries, as shown in Figure 7, with only a few institutes with marine collections from these areas in South America, mainly in Brazil, and none among the CPPS countries (Collins et al., 2021).

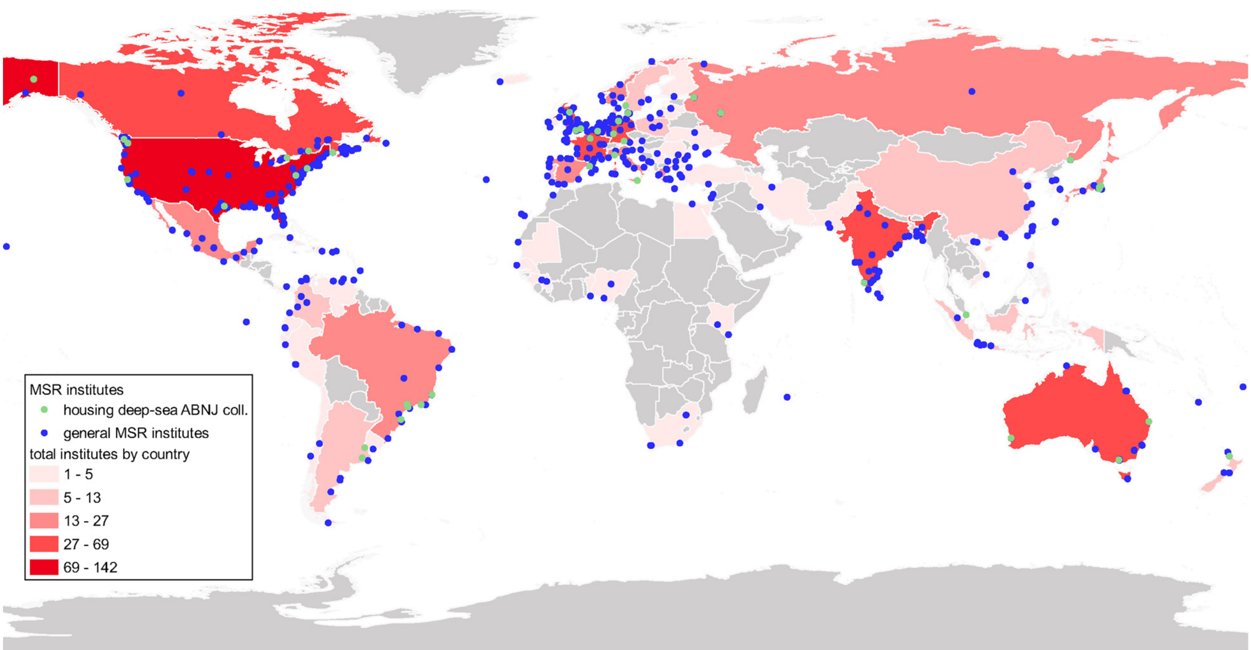

Figure 7: Marine scientific research institutes with marine collections, including those hosting specific ABNJ collections (Collins et al., 2021)

14 For more information see https://catalogue.odis.org/

However, in addition to the complexities of development, there are significant constraints in relation to the possibilities of developing research at the regional level, even more so in the case of ABNJs, given status of capacities in CPPS countries, but above all the high costs and logistical difficulties often involved in accessing ocean areas for MGR research and development, despite the notable decrease in average sequencing costs (Schuster, 2008). Some of these challenges and the associated benefits of the development process are summarised in Figure 8 adapted from Harden-Davies (2017).

On the other hand, there is a high concentration and corporate control of MGRs, with the German multi-national BASF registering 47% of all marine sequences included in genetic patents, outperforming more than 220 other companies that together account for 37%, while universities and associated entities registered only 12% globally; furthermore, 98% of all patented sequences are concentrated in only 10 wealthy countries in the northern hemisphere (Blasiak et al., 2018).

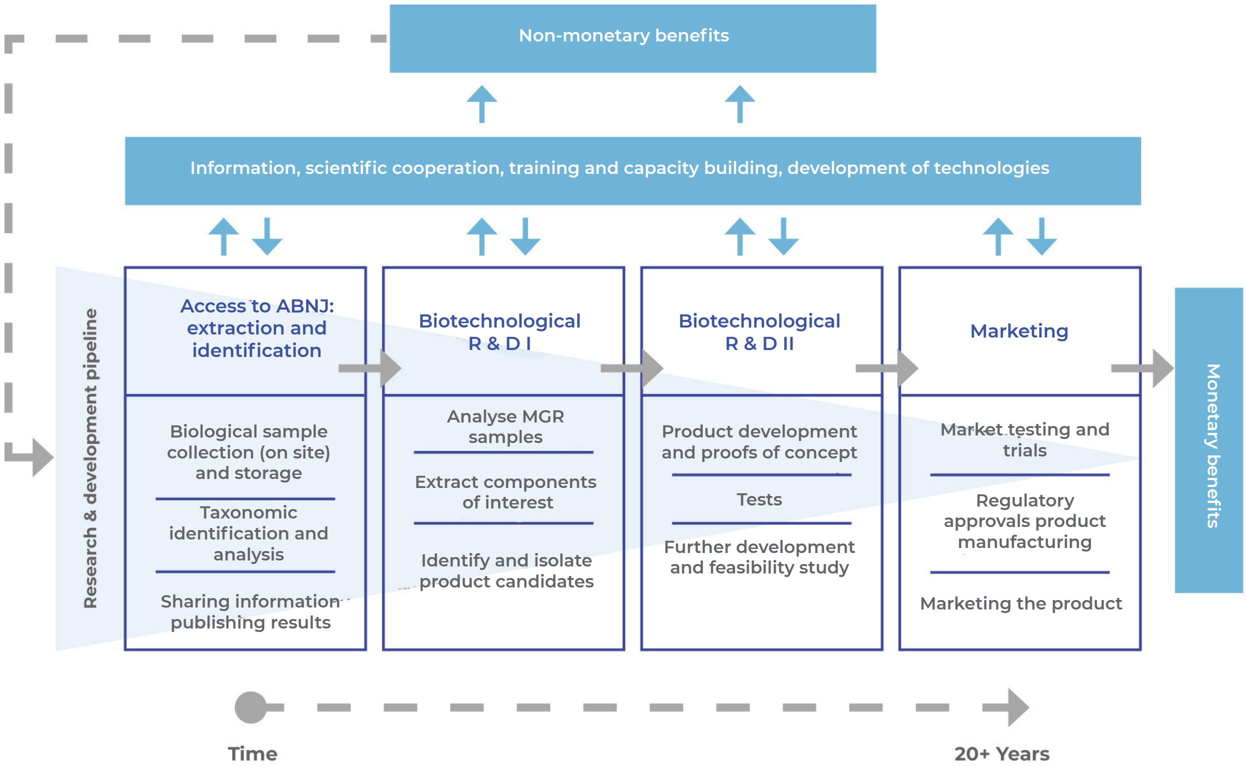

Figure 8: Illustration of the biodiscovery process based on ABNJ marine genetic resources and its relationship to socio-economic benefits. Adapted from Harden-Davies (2017)

Currently, in the context of the negotiations on a BBNJ agreement, the discussion has centred on the level of MGR development required for patenting, data and traceability systems, and the types of participation or compensation that regional countries or the international community should receive from innovations and their applications (Leary, D. 2019). However, while there have traditionally been attempts to encourage patenting and thus incentives for private developments, given that much of the genetic resources in ABNJs and their applications have not yet been discovered, being the first does not necessarily constitute a major development but rather establishes a race for materials.

Another relevant aspect to mention is that a large part of the costs of access to genetic resources in ABNJ, and especially those of extreme ecosystems, have come from public funds from different states. Some studies have shown that private investment in research and development tends to occur in later stages, when the investment risk is lower, possibly with funds that private entities access through subsidies, tax exemptions or other incentives of public origin, highlighting the importance of these developments for the common good.

However, the value of these resources is economic, scientific, social and environmental, and depend on the health and evolution of ecosystems (Marlow et al., 2019). It is a challenge to quantify this complex value created by MGRs, despite some efforts (Jobstvogt al, 2014) because it is not possible to anticipate and understand the effects that knowledge and development of MGRs could have on human well-being and their distributional effects in the future (Blasiak et al., 2018, 2020). This uncertainty regarding potential future uses, a function of advancing human knowledge, coupled with the importance of biodiversity as a source of resources, could justify a strong sustainability approach (Neumayer, 2003; Ott, 2003) and the establishment of marine protected areas for the future development of their scientific potential (Blasiak et al., 2020).

2.2. Abiotic provisioning services

2.2.1. Deep-sea mining

Mero, in his book „Mineral Resources of the Sea“ (1965) generated a picture of an essentially unlimited resource of more than a billion tonnes of manganese nodules in the deep Pacific Ocean that was growing faster than it could be exploited, a literally inexhaustible supply of metals such as Mn, Co, Ni and Cu (Glasby 2002). It was this vision that triggered the development of hundreds of exploration cruises, followed by detailed reports on the occurrence of polymetallic nodules in different parts of the Pacific Ocean, such as the northern Peruvian basin, the South Pacific, the Central Pacific, the North Pacific and the Clarion-Clipperton Zone (Sharma, 2011). This spirit of exploration and discovery is culturally attributed to the imperatives of capitalist expansion visualising undersea mining as the exploitation of yet another commodity to be exploited and traded (Childs, 2020a).

The growing demand for minerals and metals for use in the technology sector, and the scarcity of these elements on the earth‘s surface, has led to a resurgence of interest in the exploration of deep-sea mineral resources (Miller et al. 2018; Toro et al. 2020). The deep-sea mining industry has been valued at US$2-20 trillion, but threatens to disrupt a much wider ocean economy valued at US$1.5-2.4 trillion per year (Weigl, 2020). Moreover, deep-sea mining is expected to have a potential impact not only on the seabed, but also on the water column, sea surface and land (Childs, 2020b).

So far, deep-sea ecosystems have suffered few disturbances due to anthropogenic activities, however, they are likely to be poorly resilient systems (Weigl, 2020). Deep-sea species are generally long-lived, slow to reach reproductive age and have low fertility rates, so they are likely to have low resilience to impacts (Weigl, 2020).

Deep-sea ecosystems have little capacity to withstand and recover from disturbances, making it unlikely that destroyed habitats would recover on human timescales (Weigl, 2020). In the case of large-scale manganese nodule mining projects in the equatorial Pacific, environmental risks such as benthic disturbance, sediment plumes and toxic effects in the water column were assessed (Thiel et al. 2001). These risks were considered so great and unpredictable that several studies recommended the abandonment of manganese mining activities to avoid a large-scale and long-term risk to Pacific ecosystems and fisheries (Thiel et al. 2001). In addition to the direct destruction of ecosystems by mineral extraction, significant damage and disturbance could be caused by light, noise and sediment pollution. It is therefore important not only to consider these risks at the project level, but also their cumulative impact, as seabed mining would affect areas on a continental scale (Weigl, 2020).

The main target resources for deep-sea mining are manganese nodules, manganese crusts, which are located at shallower depths than nodules and have even greater potential due to their varied content and location in rock, and polymetallic sulphides found on ridges where the plates are in fracture zones. However, although manganese nodules are found on most ocean floors at depths greater than 4000 m, their local occurrence is sporadic (Toro et al. 2020). The areas whose manganese nodule concentrations are of real economic importance are in the Clarion-Clipperton fracture zone, the Peru Basin, the Central Indian Ocean Basin and the Cook Islands (Toro et al. 2020). Figure 9 shows the distribution of manganese nodules in the Pacific Ocean.

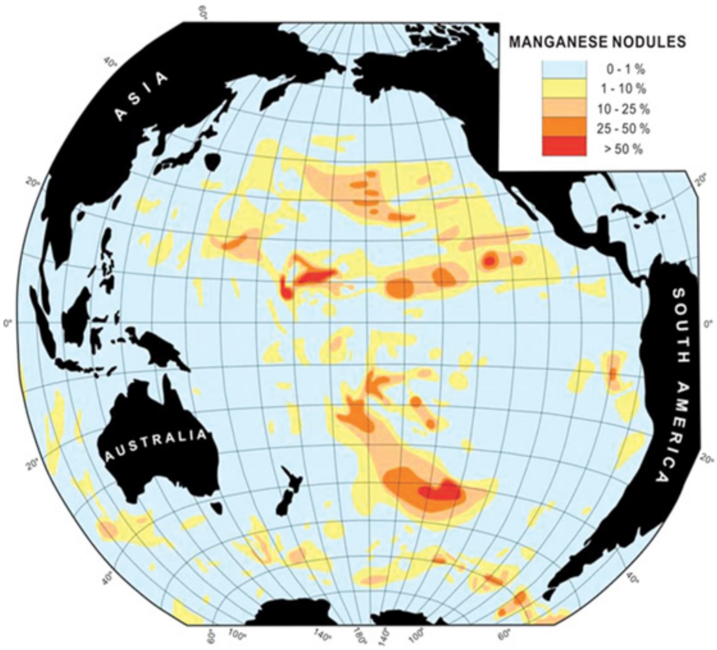

Figure 9: Schematic map of the distribution of manganese nodules in the Pacific Ocean. Contours represent the percentage of nodules on the ocean floor (Glasby et al., 2014)

The International Seabed Authority (ISA) has the task to regulate the seabed and its mineral resources in ABNJ by managing exploration and exploitation licenses. These areas have been designated as the common heritage of mankind, to be used for the benefit of mankind. The ISA has entered into 15-year contracts for the exploration of polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts on the seabed with 30 contractors. Most of these contracts (16) are for exploration for polymetallic nodules in the Clarion-Clipperton fracture zone (Table 2).

In the Southeast Pacific area, there are no contracts for exploration of polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts. At present, the areas being explored are in the Clarion-Clipperton zone, the Indian Ocean, Mid-Atlantic Ridge, South Atlantic Ocean and Pacific Ocean.

However, despite the long history of deep-sea mining exploration, it presents a number of technological challenges. These include (Toro et al. 2020):

- The duration of commercial mining operations is long.
- Difficult to predict climate change over a sufficiently long-time horizon.
- There is a lack of data and examples of large-scale operations for reference.
- It is difficult for equipment to be well maintained over time, especially in systems that are under such extreme hydrostatic pressure.

Table 2: Contractors and sponsoring countries associated with exploration for polymetallic nodules in the Clarion-Clipperton Zone.
Source: ISA (https://www.isa.org.jm/ exploration-contracts/polymetallic-nodules)

Contractor	Contract date	Expiry date	Sponsor country
Interoceanmetal Joint Organisation	March 2001	March 2016	Bulgaria, Cuba, Czech Republic, Poland, Russia and Slovakia
JSC Yuzhmorgeologiya	March 2001	March 2016	Russia
Government of the Republic of Korea	April 2001	April 2016	Republic of Korea
China Ocean Mineral Resources Research and Development Association	May 2001	May 2016	China
Deep Ocean Resources Development Co. Ltd.	June 2001	June 2016	Japan
Institut français de recherche pour l'exploitation de la mer	June 2001	June 2016	France
Federal Institute for Geosciences and Natural Resources of Germany	July 2006	July 2021	Germany
Nauru Ocean Resources Inc.	July 2011	July 2026	Nauru
Tonga Offshore Mining Limited	July 2012	July 2027	Tonga
Global Sea Mineral Resources NV	January 2013	January 2028	Belgium
UK Seabed Resources Ltd.	February 2013	February 2028	United Kingdom
Marawa Research and Exploration Ltd	January 2015	January 2030	Kiribati
Ocean Mineral Singapore Pte Ltd.	January 2015	January 2030	Singapore
UK Seabed Resources Ltd	March 2016	March 2031	United Kingdom
Cook Islands Investment Corporation	July 2016	July 2031	Cook Islands
China Minmetals Corporation	May 2017	May 2032	China

Finally, it should be noted that at least the following dimensions or sources of risk should be considered in the assessment of the socio-economic impacts of deep-sea mining:

a. Uncertainties about the current and future value of minerals combined with high investment and operating costs required, as well potential changes in global markets through increased competition or shifts in regional supply.

b. The potential impact of its development on offshore grabbing and its distributional implications on coastal and global wealth (Levin et al., 2020; Feichtner, 2019; Carver et al., 2020).

c. The cost of the loss of biodiversity and the regulatory and supporting ecosystem services associated with the deep ocean (geochemical cycles, the impact on the generation of mineral deposits, trophic role) (Orcutt et al., 2020). These impacts will most likely be high and will have an effect far beyond the sites of mining activities, with effects in the water column (vertically and horizontally) and over long distances through ocean currents. In addition to the accumulation of impacts in areas and the lack of knowledge of how these impacts will affect the oceans capacity to help mitigate climate change.

d. The cost associated with the loss of biodiversity and with it the loss of undiscovered genetic resources, the potential of which could have effects on health development, industry, or other interests (Blasiak et al., 2020).

e. The scientific and cultural risk of interfering with natural environments that are key to understanding the origins of life, its early evolution, metabolisms, and plasticity; and with it the foundations of entire scientific disciplines and their implications for the definition of socio-cultural development (D‘Hondt, 2007).

3. Ecosystem services and non-consumptive benefits of biodiversity beyond national jurisdiction

3.1. Regulatory services

3.1.1. Ocean processes and climate regulation: mechanisms and historical implications for ecosystems and humanity

The open ocean and especially the study area of this assesment play a fundamental role in climate regulation and variability through their role in modulating global atmospheric temperature, heat transport and precipitation distribution (physical processes) with profound effects on regional and distant continental climates (Allen et al., 2020). Atmospheric temperature is not only modulated by heat exchange with this vast oceanic area, but also indirectly, through exchanges of CO2 and other greenhouse gases (GHGs) at the ocean surface, whose concentration in the atmosphere is directly associated with climate trends. Such is the economic and social impact of the global regulation processes of the oceans and their biodiversity, that two decades ago the need for their inclusion as a term in the economic valuation of their services was already recognised (Costanza, 1999).

The ocean has stored 20 times more heat than the atmosphere over the last 50 years (Riebesell et al., 2009) and has absorbed 30-50% of the anthropogenic carbon emitted during the industrial period (Khatiwala et al., 2013). CO2 is sequestered by physico-chemical processes of solubility and inorganic transfer to deep waters (solubility pump), as well as by biological processes (biological pump) through which organic matter synthesised from CO2 is „sequestered" in the deep ocean or in forms unavailable for remineralisation at ecological scales. This process has been widely recognised as one of the most important ecosystem services. However, the economic valuation of the ocean is still subject to a high degree of uncertainty, as are projections of its response to climate change scenarios (Jin et al. 2020).

The mechanism that has received most attention by the scientific community is that of deposition of organic particles from the productive surface in the form of passive, passive, fecal, carcass or carbonate skeletons (Boyd et al., 2019), recently re-estimated by considering physical mechanisms of active sinking (small to medium scale processes) and horizontal transport from the shore to the open ocean. A second sequestration mechanism is active transfer by migrating organisms over hundreds of metres at mid-depths, migrators migrating from hundreds to thousands of metres depth (Boyd et al, 2019) and among them, the recently re-estimated role of whales that has been estimated at least 2 million dollars per individual (Chami et al., 2020). Figure 10 illustrates the process associated with the latter species.

In relation to carbon capture and sequestration capacity and BBNJ, in addition to the biological carbon pump (BP in Figure 11) associated with species such as that described for whales, there are the microbial trophic processes that generate dissolved organic carbon (DOC) as a by-product, and in particular those „recalcitrant" forms (RDOC), not available for biological utilisation, which would constitute a CO2 sequestration that has been defined as a microbial carbon pump (MCP) (Jiao and Zheng, 2011). This process and the BP are illustrated in Figure 11. It is estimated that the current CO2 concentration in the atmosphere would be one-third higher than its current level in the absence of these processes dependent on biodiversity.

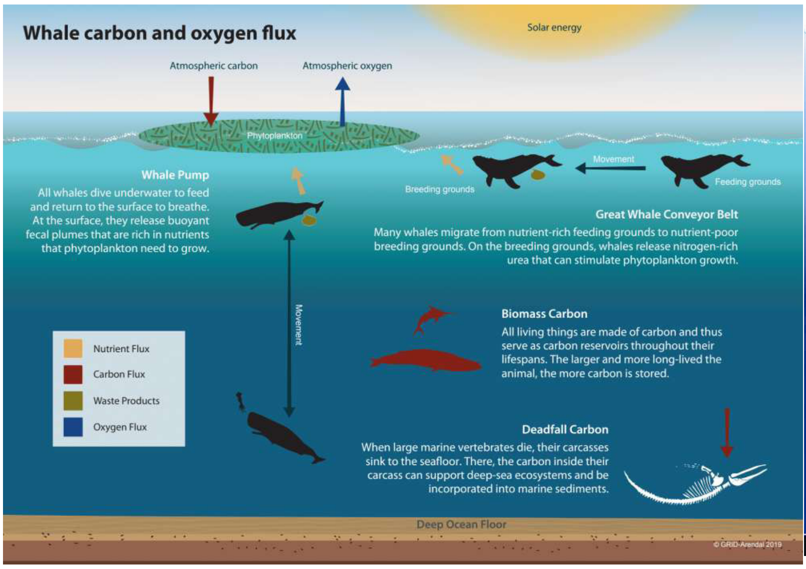

Figure 10: Carbon and oxygen flux associated with whales (Chami et al., 2019)

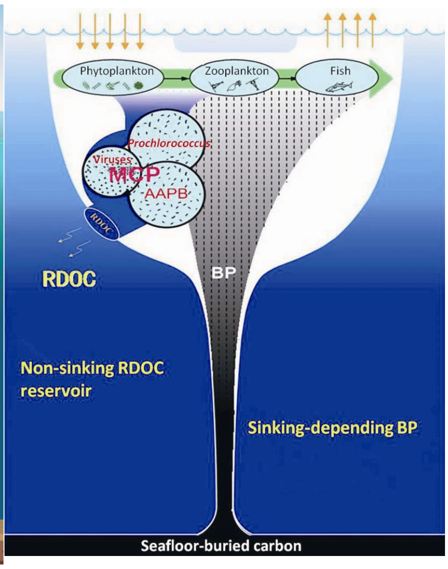

Figure 11: Main processes involved in carbon flux in the sea (Zhang, 2015)

Before considering the economic valuation available for these services in the Southeast Pacific area, it is important to acknowledge the magnitude of the impact that the sequestration process mediated by the functionality of biodiversity throughout the water column has had and is having on the biosphere and humankind. During the Eocene (54 - 48 million years ago), CO2 concentrations reached 1000 - 2000 ppm (possibly due to increased volcanic activity) and surface temperatures reached 8 - 14 degrees higher than at present (Mesarovic, 2019). Our species emerged and evolved after the period of maximum temperatures occurred thanks to an increase in biological carbon export to the deep ocean, which reduced atmospheric carbon, allowing temperatures to fall and energy to be released. Thus, oceanic physical and biological processes have been determinants in the spatial configuration and variability of the climate under which humankind has developed in recent times and influenced by the patterns of terrestrial, as well as marine, biodiversity and productivity.

This implies an intimate link with the viability of livelihood activities (both marine-fishery-aquaculture and agricultural-winery) and both marine and terrestrial conservation in a region whose development is strongly dependent on appropriate climatic conditions (Fuentes-Castillo et al., 2020; Leal Filho et al., 2020). On the other hand, the response of sea level to the thermal expansion of the warm ocean and the volume of water in liquid or ice form also impacts the continental margins and river regimes associated with glaciers, whose seasonality has developed into productive, small-scale and industrial practices, as well as cultural traditions (Reyer et al., 2017).

Additionally, throughout human history, climate has been recognised to have shaped the rise and fall of past civilisations (de Menocal, 2001), while periods of climatic deterioration in highly populated pre-industrial periods have increased the frequency of wars, famines and epidemics (Zhang et al., 2007, 2011), in the face of global temperature variation ranges of no more than 1 degree Celsius. These small global increases translate into heterogeneous climatic consequences between regions.

The cold weather cycles in the Middle Ages and up to the 15th century, some of which were already attributed to human activities, led to changes in water availability, radiation, and food production, with consequent famines in northern Europe. Today, climate change may affect not only the economy, but also political stability and the frequency of conflicts and mass migration (Lima, 2014; Gleick et al., 2014), events that are less likely to occur with adequate governance focused on social development, particularly in developing countries (Hegre et al., 2016).

3.1.2. Climate regulation under anthropogenic influence in the Southeast Pacific

The 1.3 trillion tonnes of carbon emitted into the atmosphere since the industrial period has a global effect and impacts the ocean region (Hofmann and Schellnhuber, 2009, 2010). However, the contribution to this climate forcing has been and continues to be heterogeneous, with minimal contribution from CPPS countries. In 2017, three actors accounted for more than 50% of the annual anthropogenic contribution of 35 billion tonnes of CO_2 (China, the United States and the European Union), and 10 countries accounted for 75%, with Oceania, Latin America and Africa together contributing only 8%, while CPPS countries together would contribute less than 1%; even considering per capita contributions, all countries in the region emit below the global average (Our World in Data[15]).

The ABNJ of the Southeast Pacific is a key area in modulating the anthropogenic climate trend of climate change. In particular, the equatorial Pacific rim was responsible for a „hiatus" in global atmospheric warming; surface ocean cooling induced by a natural wind cycle allowed greater heat absorption that was transferred to the Indian Ocean (Lee et al., 2015) and at depth. Also the equatorial Pacific rim is the largest source of CO_2 from the ocean to the atmosphere, and one of the most variable in the eastern Pacific, due to El Niño processes (Feely et al. 1999). However, oceanic uptake in the northern and southern subtropical Pacific is greater than equatorial absorption (Ishii et al, 2014). Recent estimates have found that biological productivity processes modulated by the cold (La Niña) stage of the Southern Oscillation (ENSO) markedly increase the flux of organic carbon at 4,000 m depth and reduce the transfer from the ocean to the atmosphere in the tropical East Pacific (Kim et al., 2019). During the last glacial period, it was this region that concentrated CO_2 at intermediate depths, which then diffused into the atmosphere by upwelling processes at the transition of its termination (Allen et al., 2020).

While the latest Intergovernmental Panel on Climate Change (IPCC) report on oceans and the cryosphere estimates that 30% of the anthropogenic carbon emitted since the 1980s would have been taken up by the ocean through physical processes (Poloczanska et al., 2020). Part of the difference in estimates based on data analysis or numerical models lies in the fact that the different biological sequestration processes have only recently been considered and quantified together.

It has recently been highlighted that the benefits of reducing uncertainties about these processes, through funding research and monitoring systems, are in the order of $0.5 trillion, although ranges up to 2 orders of magnitude greater have been estimated (Jin et al 2020). Martin et al. (2016) have valued ecosystem services for the Eastern Tropical Pacific from 30°N to 20°S and offshore to longitudes of relevance to our area of interest. Given that the estimated values reported by the authors are average values, and half of the area they assess corresponds to FAO area 87, their results are the closest we have found in the literature to the value of

15 https://ourworldindata.org/grapher/ghg-emissions-per-capita

regulating services in the region. The authors used a conservative average value of 24 gCm-2yr-1 of carbon export by biological processes, estimated the total carbon exported in the area, and assessed the potential market value of carbon using the European Union emissions trading system, and considered the costs required to set climate targets or damages. Using these results as a baseline, the conservative estimate of deep carbon export in the region would be 5×1014 gC equivalent to 1.8 × 109 tradable units, which could be estimated to be worth between $12.9 billion yr-1 and $64.7 billion yr-1 in the Southeast Pacific.

Overall, the Pacific region would be sequestering x2.5 *10¨14 gC per year, as well as contributing significantly more oceanic heat uptake relative to its surface area, given its conspicuous equatorial and coastal upwelling, which extends into the open ocean. The contribution of nutrients through migratory fauna from high latitudes is also a way of enhancing carbon sequestration through biological production, though unquantified for the region, but globally significant (Durfort et al., 2021).

In addition, the presence of the oxygen minimum zone interacts with biological communities both in metabolic modulation and greenhouse gas production, as well as in structuring important habitats for micro- and macro-species. Oxygen minimum zones produce gases such as N2, which has been assessed for the Southeast Pacific, but in addition, they also reduce CO2 production rates. Their contribution to limiting the active transfer of CO2 at depth and favourable conditions for gravitational sinking without decomposition has not been assessed for the region, but they undoubtedly also play a role in the balances and distribution of carbon between compartments, as well as in the burial of carbon in the sediments. In these areas there is a microbial capacity to use methane as an energy source, thus contributing to the abatement of a greenhouse gas in an order of magnitude more potent than CO2.

Systematically, global studies point to the need for data for the area, the wide ranges of uncertainty regarding the different rates and processes, the importance of the mesopelagic zone[16] and concerns regarding intervention on these communities, as the role of the three types of sequestration is of roughly equal magnitude (Dang, 2020). The global impact of their fluctuations is therefore known, but it is not possible at this stage to predict, but only to speculate on the trends they would produce. A further point of relevance is the role of this fauna in the trophic webs of both epipelagic predators[17] that make incursions deep or are encountered during their migration, as well as in deep trophic webs. Similarly, while reduced autotrophic productivity is predicted in all models, and hence carbon sequestration by vertical mobility mechanisms, some authors point out that the microbial pump could be enhanced, and thus increase the carbon pool, in dissolved organic form. The relative magnitudes of this are even more speculative.

Carbon is also sequestered in the seabed, where biodiversity contributes to mitigating the potential negative effects of acidification, the amount of unavailable dissolved organic carbon increases in relative concentration with depth. The dissolved organic carbon pool is one of the largest globally, larger than terrestrial pools (Polimene, et al., 2020). A global effort to study the regulatory role of ocean biodiversity during the UN Decade of Ocean Science for Sustainable Development (2021 - 2030) would be an essential contribution to establishing actions and policies that explicitly incorporate its relevance.

16 Also known as the twilight zone, it is the zone defined by light that begins at a depth where light reaches a 1% incidence and ends where there is no more light. Depths are between 200 and 1000 metres deep.

17 Those that inhabit the uppermost layer of the water column, which is also known as the surface water or the sunlit area.

3.1.3. Climate regulation under anthropogenic influence in the Southeast Pacific

The disposal of rubbish and waste of all kinds by the ocean translates into an economic benefit in that it is the consequence of saving or omitting the costs associated with this activity. From this perspective, the natural environment provides a waste treatment service, which at the same time generates a problem, especially for marine biodiversity. The following is a description of the status of this problem for the study area and the global context.

The disposal of plastic, organic and other materials from fishing vessels or tourist cruise ships has been regulated since the London Convention and Treaties of 1972 (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Materials) which aims at port regulation. However, the occurrence of fishing gear lost due to natural reasons (e.g. storms) or on purpose is evident not only in from fishing operations, but also stemming from coastal fishing including from areas separated by wide international waters. For example, a recent study by van Gennip et al. (2019) on oceanic islands in the South Pacific found that the exposure of remote and pristine ecosystems in the Easter Island regions to plastic pollution from both land-based and marine sources is mediated by circulation in the South Pacific basin.

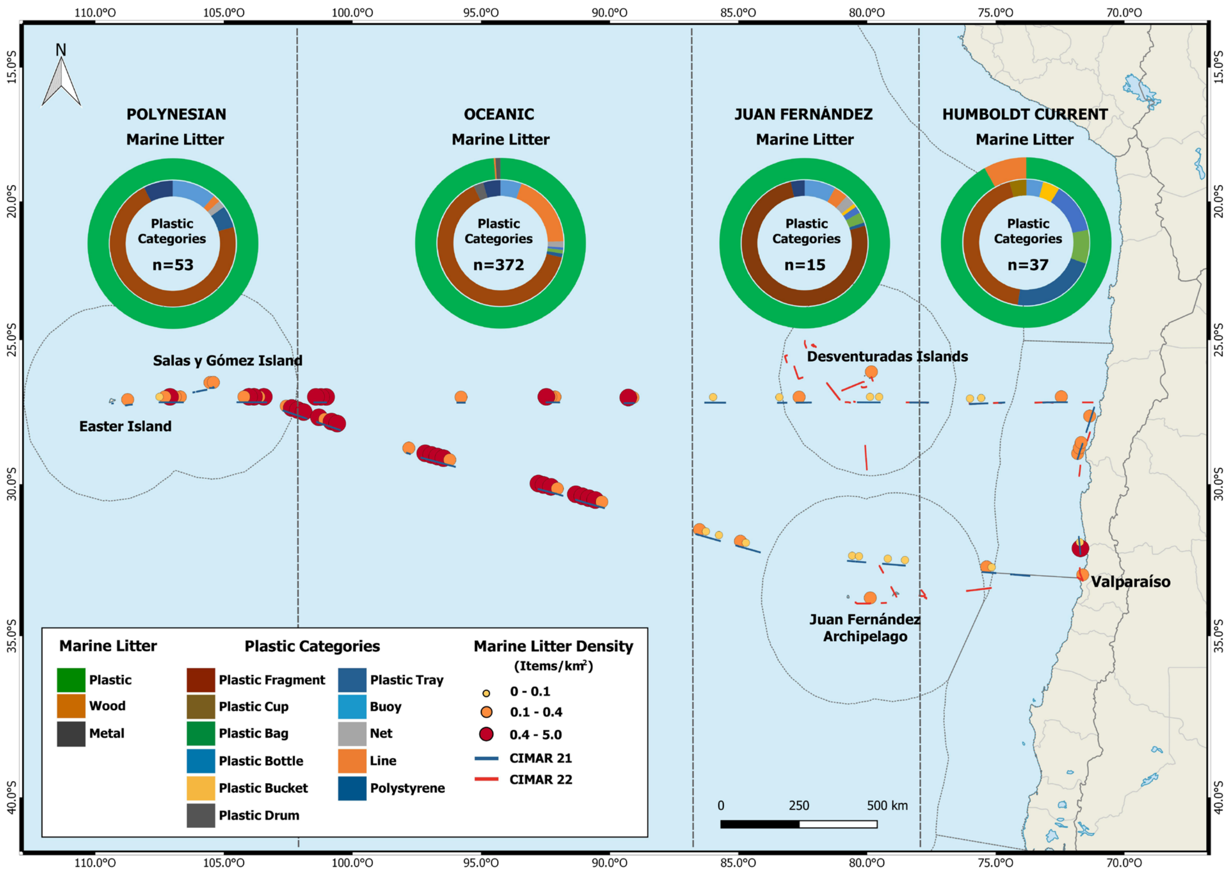

Figure 12: Marine waste types and densities in different sectors of the Southeast Pacific in 2015 and 2016 (Thiel et al., 2018)

Both floating and neutrally buoyant macro and micro litter, respectively, find their way from the coasts of Chile and from the commercially intense offshore fishing grounds of Peru's EEZ. This high presence of plastic fragments and debris, as seen in Figure 12, poses threats to the fauna of both the large marine protected areas located in the mid-Pacific (Luna-Jorquera et al, 2019) as well as in the international waters of the South Pacific Gyre with (Thiel et al, 2018).

On the other hand, significant amounts of marine waste reach the high seas from the coasts, whether they originate from river basins and urban runoff (e.g. hydrocarbons and plastics) or through city drainage. Waste management is the responsibility of jurisdictional states, and are regulated by national environmental impact legislation, as well as international precautionary guidelines. The UN Environment Assembly's working group on marine plastics, established in 2017, concluded that the international legal framework governing plastic pollution, including the Stockholm and Basel Conventions, is fragmented and ineffective. More recently, there has been growing political momentum for a global agreement to address the full life cycle of plastic, with several ministerial declarations in its favour.

There are currently no offshore or platform oil or gas extractions on the Pacific coast. The oil and gas fields are located inland, so there is no direct potential danger in installing such a platform, considering connectivity to the high seas.

In the Southeast Pacific, there is a history of disposal of mining waste materials in coastal waters (Compañia Minera del Pacífico, city of Chañaral in Chile), and recent studies evaluate the possibility of disposal in jurisdictional waters at a certain distance and depth from the coast. Such mining waste corresponds to iron ore operations that do not use chemicals in their process. However, the disposal of waste from the copper industry that uses a quantity of toxic chemicals in their processing has also been evident in the oxygen-depleted areas near disposal platforms. Discarding industrial mining waste is are regulated by each country's environment ministries and follow internal environmental impact assessment standards, although impacts have ample potential to be redistributed to the open ocean.

3.2. Support services (habitat)

Marine areas outside national jurisdictions provide habitats for a wide variety of organisms. Among these habitats, the most conspicuous are seamounts, hydrothermal vents, mid-ocean ridges and even some coral reefs (Wagner et al. 2020). There are, however, habitats in ABNJ that do not have boundaries or easily defined spaces (e.g. pelagic space or airspace). However, these spaces are highly dynamic and harbour organisms capable of influencing and connecting their environment with other habitats even within EEZs, with important economic effects. Therefore, some authors have suggested that it is the biomass of these organisms and the ecological roles they play that constitute a habitat per se in areas outside the jurisdiction (O'Leary and Roberts, 2018).

The most notable organisms that can be found in ABNJ are generally considered part of the marine megafauna and include among other cetaceans, pinnipeds, marine reptiles, fish such as tuna, sharks and rays, and seabirds. For these organisms, ABNJ are important migration and feeding grounds (Dunn et al. 2019). Much of this megafauna may remain in these areas for 45-75% of the year (Harrison et al. 2018). Biodiversity in oceanic areas thus constitutes critical habitats for the survival of these species, which also play a fundamental role in the provision of regulating services (as discussed in 3.1).

Economic valuation of the role that ABNJs play through supporting services such as habitat in general, and as habitat for groups such as megafauna in particular, can be a complex task considering that existing valuation tools are limited in assigning a monetary value to this service. Indeed, it is the supporting services themselves that enable the life of various species, as well as being closely linked to the provision of other ecosystem services such as regulating and cultural services, often without necessarily being co-located in space (Drakou et al., 2017).

One way to explore the value of habitat services, which are generated in ABNJ and directly affects other services such as those associated with cultural services in tourism, would be through a monetary approach to the value of habitat for megafauna in ABNJs based on the value they generate (impact), for example, in supporting tourism activities of observation and special interests such as diving. Under this logic, a healthy habitat for migratory species such as sharks or whales directly benefits tourism that takes place in areas within the EEZ (Vierros et al. 2020), benefiting from the support that habitats provide to the species. A description in this sense with value for a regional case is developed in the following section (3.3).

In general terms, habitat services are considered as intermediate services, as they are necessary or essential for the generation of all other ecosystem services, providing spaces in which plants and animals live, allowing for species diversity and genetic diversity. Hence it is important to maintain marine ecosystems in a healthy state, thus guaranteeing the processes the generation and productivity of the biological diversity they support. This is essential for the development of other ecosystem services, such as provisioning, regulation and cultural services.

3.3. Cultural services

3.3.1. Tourism and identity

Cultural services are related to a wide range of religious, aesthetic, economic and place-based values and are grounded in social relationships and interactions with the environment. This gives way to non-material benefits that people derive from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences.

Tourism, leisure, and recreation are the best understood ocean cultural ecosystem services and are fundamentally associated with the coast, but technological advances and a growing tourism sectors enable the exploitation of offshore ecosystem services, such as transoceanic cruises and deep-sea tourism (Rogers et al., 2014).

Currently in the Southeast Pacific area there are tourism activities closely related to and dependent on the connectivity of coastal ecosystems with ABNJ and their status, the most representative cases being those associated with experiences of observing migratory species such as sharks and cetaceans.

Taking the example of nature tourism in the Galapagos Islands, particularly that associated with marine ecosystems, Lynham et al. (2015) estimate that of the total $256 million generated by tourists in 2014, 58% of this value was generated from marine activities and experiences. This also creates multiplier effect in terms of services and other economic activities. Considering this, the authors estimate this economic impact of marine tourism in the Ecuadorian archipelago at $236 million dollars per year and approximately 5,019 jobs corresponding to 37% of employment in the islands. Furthermore, from estimates of megafauna densities in the area, they conclude that the average value of each shark in terms of its contribution to tourism during its lifetime would reach $5.4 million per year, the highest value reported in the world, whereas at the time of the study a shark caught brought only $158 (Lynham et al., 2015).

Similarly, tourism generated by whale watching (mainly humpback whales) in several locations in the Southeast Pacific is an activity that depends on the health of the migratory routes of these species, some of which occur largely in the ABNJ (Félix & Guzmán, 2017; Hucke-Gaete et al., 2018). Moreover, according to Harrison et al. (2018), many species of Southeast Pacific megafauna may spend 45-75% of their time in habitats outside national jurisdiction.

The value generation potential of the whale watching industry worldwide has been estimated at $ 2.5 billion per year (Cisneros-Montemayor et al. 2010). While, at the regional level, for some locations in the Southeast Pacific such as Machalilla Park in Ecuador or northern Peru, values of approximately $ 3 million per year in income have been estimated (Castro et al. 2015; Guidino et al. 2020). Figure 13 shows the relative values of activities linked to whale-watching tourism in northern Peru as an example. All this, in addition to the value of these migratory species, and BBNJ in general, in terms of their contribution to the regulating ecosystem services discussed above.

When it comes to the sea, socio-cultural relations generally take place in coastal areas; however, there are communities on oceanic islands that, despite carrying out their activities in EEZs, can be considered relevant ABNJ due to their location. This is the case of Easter Island (or Rapa Nui) and the Juan Fernández archipelago (Robinson Crusoe Island), where the conditions of isolation have allowed them to forge their own identity and relationship with the sea.

It is important to take these aspects into consideration when designing governance proposals for ABNJ, because of the relationships that are established between these types of communities, which are often native or indigenous peoples with a strong sense of tenure and rights to the sea (Vierros et al., 2020).

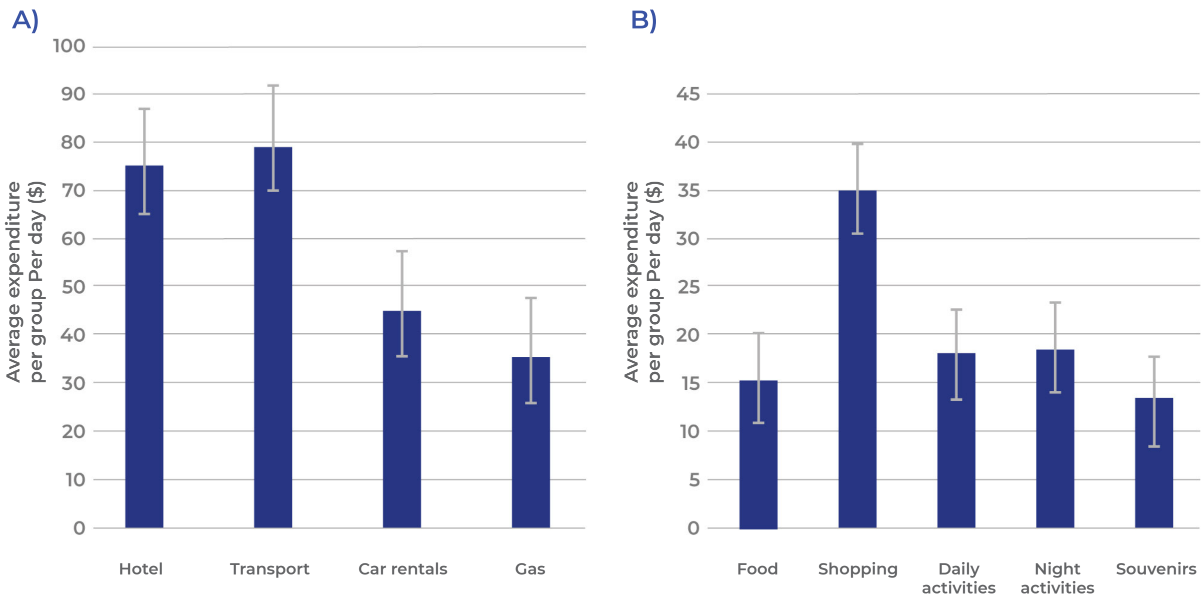

Figure 13: Average expenditure in US dollars per group per day by expenditure category for whale watching activities in northern Peru. Major expenditures (A) and minor expenditures (B) (Guidino, 2020)

Box 3: THE CASE OF INSULAR CHILE

In the Rapa Nui culture, there is a strong link between the sea, the land, and the sky. The Rapa Nui people are strongly identified with the sea, generating an important sense of belonging, which has different manifestations. For example, the Rapa Nui consider themselves a fishing people, they claim to have an ancestral right over the exploitation of fishery resources and have managed to maintain the tradition of fishing through ancestral capture techniques and the consumption of coastal resources strongly related to their culture and tradition (Universidad Católica del Norte, 2018). There are traditions of the Rapa Nui people that are related to the sea, such as HereKoreha (eel fishing), Polynesian canoeing (reintroduced in 1995), Haka-Honu (gliding over waves with only the body) and Haka Nini (surfing), diving and swimming (Edmunds, 2005). In addition, the sea is a source of inspiration for different artistic manifestations, such as painting, singing, and dancing, reaffirming the sense of spirituality that they assign to it. To this is added the sea as a source of research or information for cognitive development (science, environmental education, etc.).

For the community of Robinson Crusoe and Alejandro Selkirk (Juan Fernández Archipelago) the sea has a very strong cultural value because of the sense of belonging that its inhabitants, and in particular the fishermen, have developed over the years. The area is a source of aesthetic appreciation and inspiration for culture, art, and design, in addition to the spiritual sense that the fishermen and their families attribute to it. Added to this are: a sense of sovereignty; cognitive effects or information for cognitive development (science, environmental education, etc.) and a sense of belonging for „insular“ and „continental“ Chileans. This is particularly true for the artisanal lobster fishermen of Juan Fernández, whose activity dates back more than a century and who were pioneers in the establishment of self-regulation measures in the exploitation of this resource. It is also important to note that complementary to lobster exploitation, tourism and recreational fishing are growing significantly in the area. This is very important because new productive activities are beginning to develop around these cultural services, which could even be complemented by others in the future, such as diving, which is currently in an emerging state of development.

From a cultural point of view, the relationship that has been established between the community and the sea and the understanding of the dependence and interaction they have with its ecosystem services is so strong that it has led them not only to promote management and protection measures for the exploitation of the Juan Fernández lobster, the main economic resource of the area, but also to the creation of marine protected areas, such as the marine parks network and a protected coastal marine area for multiple uses. This idea of ecosystem protection, recognising different scopes such as conservation and preservation, reflects an unprecedented relationship between population and ecosystem services, which recognises the interaction of ocean systems and the benefits obtained from them.

3.3.2. Knowledge and scientific development

In recent years, scientific research in ABNJ has become increasingly recognised as essential for a better understanding of ocean processes and ecosystems, which in turn is important for enhancing conservation and resource management efforts, understanding their relationship with climate and biogeochemical cycles on land, and developing new pharmaceutical and biotechnological applications (Gjerde, 2006; Ottaviani, 2020). Developing scientific research in ABNJs is complex and costly, which is a major barrier to their development.

In the Southeast Pacific there are two seamount chains that are tremendously relevant, the Nazca and Salas y Gómez ridges, which extend from jurisdictional waters to the ABNJ. Together these two ridges represent 5.0 % of the FAO Area 87 high seas and 54 % of the seamounts in the Southeast Pacific (Gálvez-Larach, 2009). Both mountain ranges concentrate a good part of the scientific expeditions that have been developed in the area (see for example Wagner et al., 2021) and despite the fragmented nature of the research and knowledge generation around them, over the years a better identification and understanding of the ecosystem services of the area has been achieved, integrating, or relating geographic, oceanographic, and biological aspects.

The importance of knowledge generation and scientific development around the ocean is critical to ensuring a sustainable future, as summarised by Visbeck (2018) in Figure 14. According to the author, investing in new discoveries translates into both global and regional societal benefits, as better understanding, modelling and predictions, and consequently better possibilities for policy-relevant assessments and governance of maritime space allow the benefits derived from this global resource to be generated and sustained.

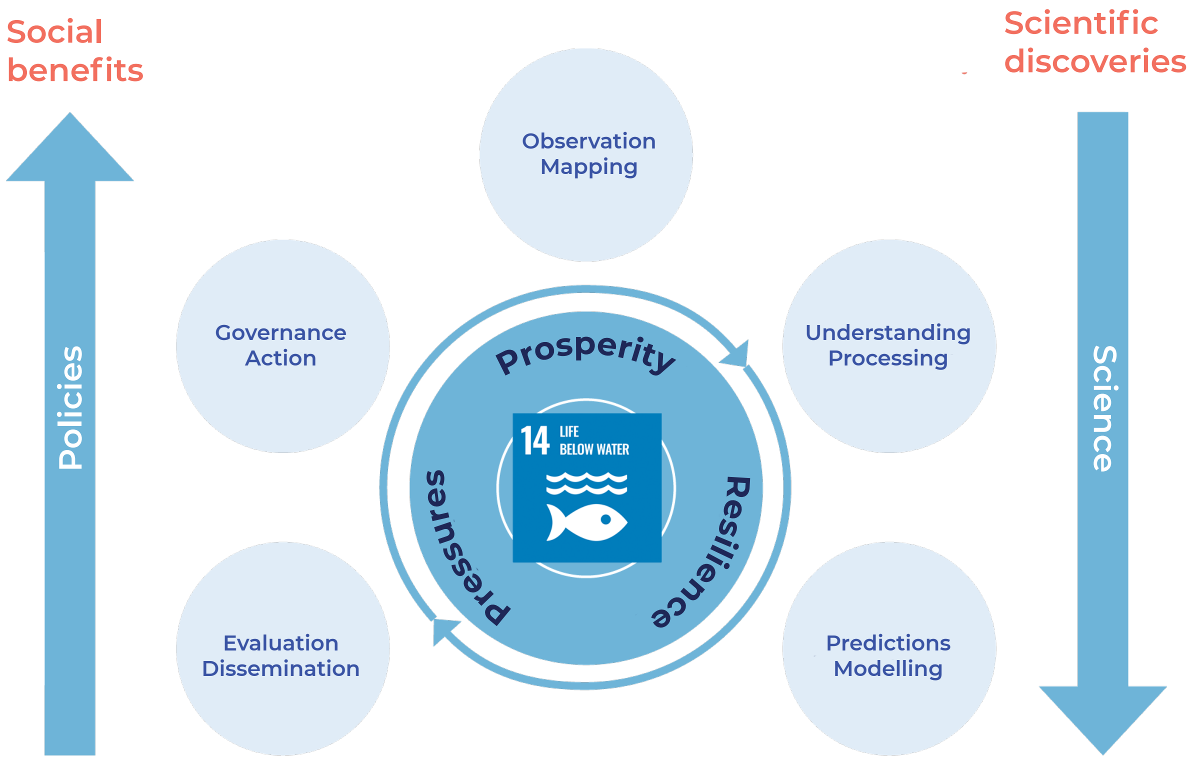

Figure 14: Importance of scientific development in producing social benefits and Sustainable Development Goal (SDG) 14 (Visbeck, 2018)

Very different levels of research efforts have been carried out throughout the ABNJ of the region. With the equatorial Pacific being one of the most productive areas and the main one affected by El Niño variability (Pennington et al, 2006), it has received international attention during the last decades, with important research cruises in that area (WOD, 2018), while conditions are permanently monitored by satellite and autonomous instruments[18].

The South Pacific oceanic gyre is one of the least explored areas globally. Less than a dozen regional cruises (e.g. CIMAR Islands 1999, 2000, 2015, 2016) and a few international ones (von Dassow y Collado-Fabbri, 2014) have already shown, however, that the biogeochemical processes differ substantially from the other ocean areas with implications for global cycles and climate projections that are still underestimated.

Together with the presence of submarine ridges and a conspicuous area of minimal oxygen, the area within the Pacific FAO 87 area is motivating international research efforts: mobilisation of funds, inter-institutional partnerships, opportunities for linkages with research centres and the development of new research projects and opportunities for human capacity building and technology transfer in the region. Some examples are: cruise on Japanese ship „Mirai" in 2019 (Sellanes, 2019; 2020); BIOSOPE cruise in 2004 (Claustre et al., 2008) and Big Rapa in 2010.[19]

The knowledge generated is fundamental both for climate prediction and for predicting the location and productivity of fisheries, as well as generating information of global importance. The monitoring systems are mostly maintained by long-distance programmes, with the participation of the countries of the region in the financing and research of these areas being reduced with respect to the participation of the international community, and when it is carried out, it is in association with the latter. Thus, there are strong asymmetries between North and South for scientific research on marine biodiversity, with collaborative networks concentrated in a small number of countries, particularly in Europe and the United States, and underdeveloped in the South American case (Tolochko and Vadrot, 2021). This results in a disadvantaged position in consideration of the importance of scientific capital and collaboration in the design and implementation of regional governance arrangements.

18 For examples see https://psl.noaa.gov/enso/enso. current.html https://www.pmel.noaa.gov/gtmba/pmel-theme/pacific-ocean-tao
19 For more information, see https://www.bco-dmo.org/dataset/3768

Box 4: ESMOI MILLENNIUM NUCLEUS AND CHARLES DARWIN FOUNDATION

The development of science and research has been fundamental to form a better understanding of ecosystem services in ABNJ, although the most systematic efforts have been developed in EEZs, but on oceanic islands.

For example, the Charles Darwin Foundation has been present in the Galapagos Islands since 1959. Through its scientific station, it began by studying the natural systems of the archipelago, gradually incorporating the human dimension, and gaining a better understanding of the challenges for conservation and sustainability efforts in the Galapagos. In this way, it has been able to develop three important lines of research: ecosystem conservation, ecosystem restoration, and sustainable development and human well-being. **(https://www.darwinfoundation.org/es/investigacion).**

In this regard, it is important to highlight the work carried out by the Chilean National Oceanographic Committee (CONA), through its Programme for Scientific and Marine Research in Remote Areas with the research cruises CIMAR 6 in 2000 and CIMAR 22 in 2016 around the Juan Fernández Archipelago and Desventuradas Islands and CIMAR 21 in 2015 on Easter Island and the Salas y Gómez Islands, which have contributed significantly to the generation of knowledge. Although these expeditions have been carried out in Chile's Exclusive Economic Zone, they are sites of oceanic ecosystems that are part of the Nazca and Salas y Gómez mountain ranges, respectively, and that extend mainly in ABNJ.

The contribution made since 2014 by the Millennium Nucleus on Ecology and Sustainable Management of Oceanic Islands (ESMOI) has also been fundamental, as it has contributed significantly to the understanding of the ecosystem services of seamounts, which are extremely vulnerable ecosystems and are home to high rates of endemism and biodiversity **(http://www.esmoi.cl/publicaciones-cientificas/).**

These local research efforts in oceanic areas have been fundamental to understanding the dynamics of migratory species, which use different types of habitat at different stages of their life cycles and depend on different spaces in their migratory processes, making them more vulnerable than resident species **(https://www.cms.int/sites/default/files/publication/CMS_brochure_s.pdf).**

The knowledge gained from these initiatives can be a fundamental input for the design and implementation of ecosystem-based transboundary governance.
(https://www.cbd.int/doc/meetings/mar/ebsa-ettp-01/other/ebsa-ettp-01-cpps-sec-es.pdf).

4. Other activities present in the Areas Beyond National Jurisdiction of the South East Pacific

4.1. Maritime Transport

Commercial shipping is the predominant mechanism for the global transport of goods, allowing access to markets over long distances, which is particularly important in the case of raw materials.

In 2019, the world commercial shipping fleet grew by 4.1% and in the same year moved 11,076 million tonnes of cargo, of which 29.12% was dry cargo: bulk (iron ore, coal, bauxite/aluminium and phosphate), 28.61% tankers (crude oil, refined petroleum products, gas and chemicals) and 42.27% other dry cargo (bulk commodities, containerised trade and general cargo) (UNCTAD, 2020). At the end of 2018, more than 50% of the carrying capacity (tonnage) was concentrated in Greece, Japan, China, Singapore and Hong Kong (China), while in terms of the commercial value of the fleet (910,885 million dollars), 45% is concentrated in Greece, Japan, the United States, China and Norway; while in terms of tonnage, Panama, Liberia and the Marshall Islands account for 15.5% and these same countries represent 41.6% in terms of tonnage (UNCTAD, 2019).

Container cargo throughput in Latin American and Caribbean ports in 2019 exceeded 54.2 million TEU[20], representing 6.5% of the total world container throughput. According to the number of TEUs moved, 10 countries account for 81% of the total cargo handled in the region, including Brazil, Panama, Mexico, Chile, Colombia, Peru, Ecuador, Dominican Republic, Argentina, and Jamaica (Sánchez and Barleta, 2020).

Regular container cargo services calling at the main ports of the West Coast of South America (WCSA) are part of direct routes to North East Asia, North America (West and East coasts), Europe, Central America and the Caribbean (Figure 15). Up to 2010, the number of connections is highest with transshipment ports in Panama (Balboa, Colon and Manzanillo) and, as far as the final destination or origin regions of container cargo are concerned, with the Asian ports of Keelung, Shanghai, Ningbo, Xiamen, Chiwan (Shenzhen) and Hong Kong, as well as with the ports of New York, Miami and Manzanillo (Mexico) in North America; and Hamburg, Rotterdam and Antwerp in Europe.

Among the main companies covering shipping routes through WCSA are: Maersk Sealand, considered the largest shipping company in the world, with 542 vessels and 2.6 million TEU capacity as of May 2012; Mediterranean Shipping Company (MSC), with 440 vessels and 2.6 million TEU capacity as of May 2012; Mediterranean Shipping Company (MSC), with 440 ships and 2.21 million TEU as of July 2012; Compagnie Maritime d'Affrètement - Compagnie Générale Maritime (CMA CGM), the third largest shipping company in the world with 394 vessels and 1.32 million TEU; Hapag Lloyd, the fifth largest in the world with ships operating close to 650 thousand TEU and the Chilean capital company Compañía Sudamericana de Vapores, 11th in the world with 98 vessels and 343,776 TEU at the beginning of 2010 (González et al., 2012).

20 Twenty foot equivalent unit is a standard measurement of a metal box that can be easily transferred between different modes of transport.

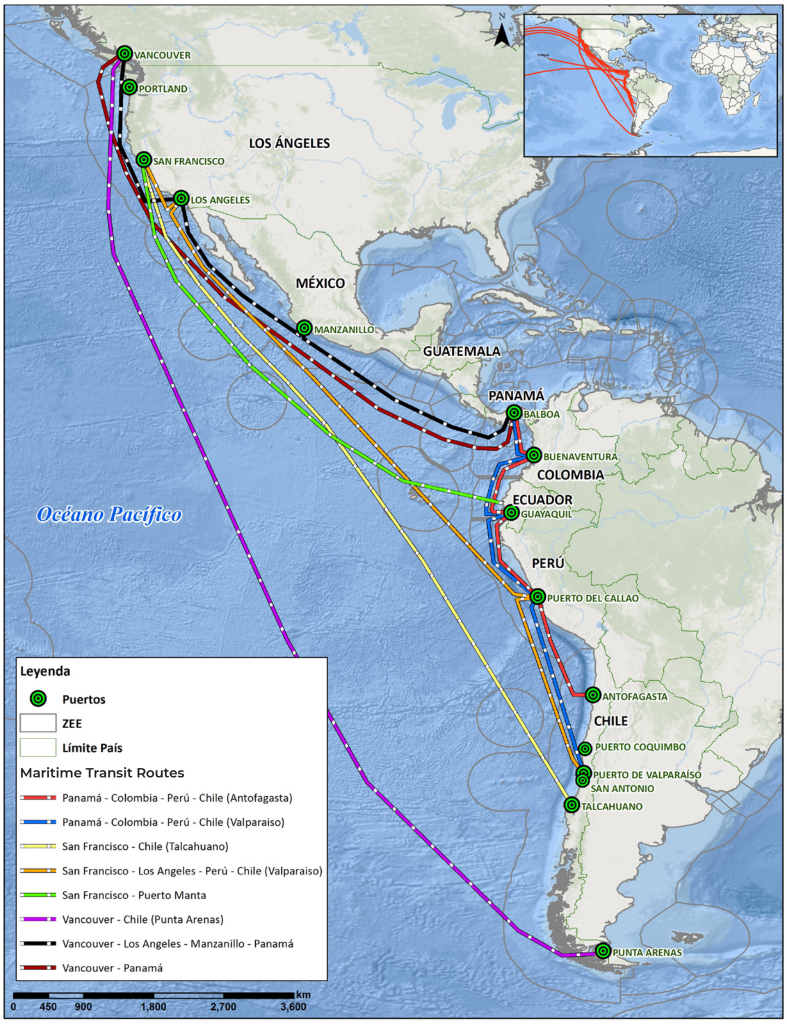

Figure 15: Detailed routes to/from the West Coast of North America, Central America and the West Coast of South America. Adapted from https://www.shipmap.org/

It is noteworthy that none of the WCSA ports fulfils the function of a Latin American Pacific-wide port hub, so that many of the regular services connecting them with Europe and the east coast of North America include calls at ports in Central America (Balboa, Colon and Manzanillo in Panama for inter-oceanic transshipment) and the Caribbean, while the vast majority of the regular services connecting them with northeast Asia include calls at ports in the Caribbean, Colon and Manzanillo in Panama for inter-oceanic cargo transshipment) and the Caribbean, while the vast majority of scheduled services connecting them with northeast Asia include calls at ports on the west coast of North America, in Manzanillo (Mexico) especially, for Pacific Ocean cargo (Gonzalez et al., 2012).

According to the United Nations Economic Commission for Latin America and the Caribbean, the ranking of the top five ports in container movement for 2019 in the WCSA is composed of Balboa in Panama (2,898,977 TEU), Callao in Peru (2,313,907 TEU), Guayaquil in Ecuador (1,943,197 TEU), San Antonio in Chile (1,709,642 TEU) and Buenaventura in Colombia (1,121,267 TEU). As a reference in 2018, the main port in the world was Shanghai (China) with 42,010,000 TEU and in Latin America and the Caribbean, Colón (Panama) with 4,324,478 TEU (UNECLAC, 2020).

Seven of the 10 most connected ports in the WCSA during 2019 are Chilean and include those that only started receiving container services in the last 10 years (Coronel and Lirquén) (UNCTAD, 2019).

The latest investments in the COAS ports seek to increase the efficiency of services and cover demand projections as follows: container cargo in the cases of Callao (Peru) and San Antonio (Chile) and bulk cargo of coffee and sugar in the case of Buenaventura (Colombia) and bananas in Guayaquil (Ecuador) (González et al., 2012) (González et al., 2012). However, the impacts of the COVID 19 pandemic mean that all forecasts for future stability and growth have to be revised, e.g. from a forecast of 3.6% growth in world container trade in the last quarter of 2019 to 2.5% in January 2020, -4.9% in April and the latest figure in June with a fall of
-8.6% (Sánchez and Barleta, 2020).

On the other hand, the questioning of the environmental impacts of maritime transport has focused on aspects such as atmospheric pollution and greenhouse gases, dumping of rubbish, bilge water, ballast water, wastewater, biofouling or introduced marine species, dumping of goods, containers falling into the sea and noise (Eslava, 2018).

In relation to environmental pollution, one of the biggest problems has been the presence of sulphur in heavy fuel oil, a fuel used by larger ships and which is derived from the residue of crude oil distillation, which because of combustion ends up being released into the environment as sulphur oxides (González-Canales, 2013). In the search for greater environmental sustainability, the International Maritime Organisation (IMO) has been restricting the limit of sulphur allowed in fuel starting in 2020 reducing the maximum allowed from 3.5% to 0.5 %; a rule whose application, compliance and supervision is the responsibility of the States Parties to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as amended by the Protocol of 1978 (MARPOL 73/78) (UNCTAD, 2019).

4.2. Submarine Cables

Submarine cables are the basis of the world‘s international telecommunications network (Takei, 2012). Their history dates to 1857 with the start of the Transatlantic Telegraph Cable project that sought to connect America with Europe and whose objective was achieved in 1866. From that moment on, and for almost 100 years, they proliferated until they were replaced by the massification of satellite communications. Then, from the 1980s onwards, driven by the development of the internet and the use of fibre optics, submarine cables once again came to the fore - there are currently more than a billion metres of submarine cables.

The growing global demand for data flow has gone hand in hand with the increasing transmission capacity of fibre optic cables, which will continue to drive the laying of new submarine cables (Merrie, 2014).

In the case of the Southeast Pacific, and in particular of the ABNJ, as can be seen in Figure 16, there are two large cables that are found along the west coast of the continent, reaching south to the central area of Chile 476 km long, connecting Los Angeles (United States) with Valparaiso (Chile) and owned by Google; and South American Crossing, which connects Valparaiso (Chile) with Las Toninas (Argentina), passing through the Caribbean and extending 20,000 km and owned by Telecom Italia Sparkle, Lumen. There are other cables of shorter length and covering routes between some countries or even within a single country. These cables run to some extent in areas outside the countries‘ jurisdictional boundaries.

Although there is currently no cable that connects South America directly with Asia across the Pacific, there is a new project that would do so from Chile and would pass through Rapa Nui and Juan Fernández, with a length of approximately 25,000 kilometres, making it the longest submarine cable in the world.

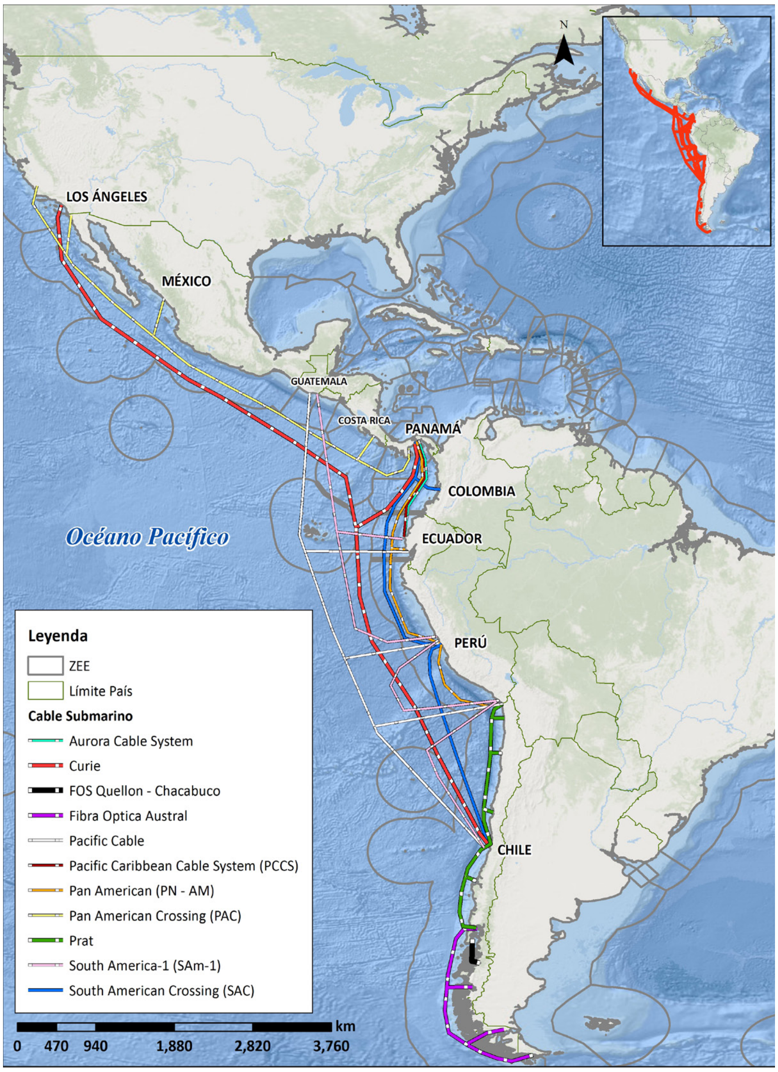

Figure 16: Map of submarine cables in the Southeast Pacific. Adapted fromwww.submarinecablemap.com

Although there is a tendency for coastal States to increase environmental regulations on submarine cables and their operations, it must be taken into consideration that these are covered by international law (Convention 1884 for the Protection of Submarine Cables and the 1982 UNCLOS).

According to international law, submarine cables in ABNJ cannot be considered pollution of the marine environment and cannot realistically cause pollution. A modern fibre-optic cable is not a substance or energy that can cause harmful effects or damage to living resources and marine life (International Cable Protection Committee, 2016). However, the absence of historical (baseline) seabed research in ABNJ makes it difficult to assess changes in the marine environment. On the other hand, noise, heat dissipation, electromagnetic fields and disturbances associated with the installation of submarine cables have been identified as potential environmental impacts. However, the cost-benefit ratios associated with environmental impact assessments of submarine cables are not justified by the limited, and in some cases transitory, nature of these potential impacts.

On the other hand, undersea cables become a substrate for the growth of marine organisms and their recovery can also contribute to a better understanding of the seabed. Shark attacks on underwater cables were thought to cause some kind of disturbance to these species, either by smell, colour, movement or electromagnetic fields, but improvements in laying techniques, coating and materials have significantly eliminated these attacks.

Technological advances allow exhaustive analysis of the seabed, making it possible to select the most appropriate routes for cable laying, not only to maximise cable protection, but also to minimise environmental impacts (International Cable Protection Committee, 2016). It also enables the installation and articulation of marine observatories in deep waters for multiple purposes, such as the study of turbidity currents or climate change.

4.3. Illegal activities

When the discussions on the current UNCLOS were finalised in 1982, the problem of crime at sea and in the ABNJ was not a major concern. Crimes included illegal fishing, human trafficking (enslaved people), and unauthorised travel. Today, the range of illegal activities at sea and ABNJs has increased to include activities such as piracy, armed robbery at sea, maritime terrorism, proliferation of weapons of mass destruction, trafficking of migrants, people and drugs, organised crime within the fishing industry. Most of these crimes are considered to occur in ABNJ. Many of these activities are interrelated as they are carried out by organised criminal groups. States have designed multilateral and bi-national treaties to combat this phenomenon such as the 2005 SUA Protocol (Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation) or the 2000 Smuggling Protocol (2000 Protocol against the Smuggling of Migrants by Land, Sea and Air, supplementing the United Nations Convention against Transnational Organized Crime) (Papastavridis, 2014). In the Southeast Pacific, possibly the most significant illegal activities in the ABNJ can be considered illegal fishing and drug trafficking. The latter activity may be carried out in some areas close to the jurisdictional areas of Ecuador, Colombia, and Peru. It is estimated that 90% of the cocaine exported from South America leaves the region by sea. Much of the region's drug trafficking may take place on fishing boats (Belhabib et al. 2020).

4.4. Maritime Security

Maritime security can be considered a multidimensional concept in constant transformation, increasingly moving towards a comprehensive and strategic consideration. This has made it possible to move from a concept centred on safeguarding human life at sea („safety“) to one focused on security, even reaching aspects of national security (Tavra, 2007). Maritime security considers the risks and threats both in the field of people and in the field of international affairs (Rodríguez, 2015), which from a systemic perspective refers to the safety of vessels, from an endogenous consideration, and to the safety of navigation, from an exogenous perspective (Gabaldón, 2012). This is reflected in the conventions of the International Maritime Organisation (IMO), such as the International Convention for Safety of Life at Sea (SOLAS) and MARPOL.

On the other hand, the strategic consideration of the concept of maritime security requires paying special attention to those aspects that are directly or indirectly related to it, such as illegal immigration in general, the illicit trafficking of people, drugs and weapons, piracy and terrorism, maritime environmental pollution and degradation, and the depredation of maritime resources (Rodríguez et al., 2016).

5. Benefits from areas beyond national jurisdiction in the Southeast Pacific: uncertainty and distributional implications of governance

5.1. Benefits and uncertainty

Economic activities that depend on BBNJ and ecosystem health account for most of the consumptive benefits generated in ABNJ of the Southeast Pacific, especially for the CPPS countries. Furthermore, the high levels of connectivity and feedback between oceanic and social systems present important challenges in understanding the levels of interdependence in heterogeneous and highly uncertain ecological, social, and economic contexts, especially in the face of the climate crisis and frenetic biodiversity loss (Cardinale et al., 2012; Molinos et al., 2016).

Because of the above, there are two major sources of uncertainty that hinder the assessment of the potential socio-economic benefits stemming from the ABNJs of the Southeast Pacific. The first relates to the underdeveloped (albeit growing) scientific knowledge of these areas and with it, the understanding of their ecosystem dynamics and future capacity to provide the services described in this report. Today it is at best possible to partially estimate existing natural processes, while it is not possible to fully foresee future technological development, which could contribute to both conservation and further exploitation and thus condition (or strengthen) the capacity of the BBNJ to provide ecosystem services in a sustainable manner. This is evidenced by the existence of uses that compete with the conservation of biodiversity, so that maximising biodiversity at the ecosystem level does not necessarily imply maximising its economic value (Paul et al., 2020).

On the other hand, the second source of uncertainty relates to the evolution over time of societal preferences for activities in ABNJ today, and those that will be developed in the future, resulting from the dissemination of information and different discourses on ocean governance (Silver et al., 2015), as well as various scientific and technological advances and the potential development of new goods and services.

Both types of uncertainty, together with the institutional dynamics that will be established, will influence use decisions, environmental costs and future conservation policies, whose evaluation will be insufficient in the traditional framework of a cost-benefit analysis, considering the complexities and high interconnectedness of natural systems, as well as the difficulty of quantifying the costs and benefits of productive effects on jurisdictional areas and non-consumptive ecosystem services (Groeneveld, 2020; Thurber et al., 2014; Jobstvogt et al., 2014), which ultimately sustain life on the planet.

Thus, the evolution of the complementarities discussed in this report will define the sustainable development trajectories of the so-called blue economy, and of the countries in the region, justifying a precautionary approach to the development of economic activities in ABNJ, given the incomplete knowledge of their real impacts on BBNJ, particularly in the case of mining (Levin et al., 2020).

To reduce these uncertainties, in addition to advancing knowledge of natural systems and their interrelationships, it will be important to incorporate appropriate information for economic decision-making beyond the traditional national accounting framework which emphasises production statistics and their growth. While it would already be a step forward for the CPPS countries to improve the reporting of sectoral statistics for fisheries in a systematic way, currently scattered in sporadic studies, it would also be a step forward to advance in ecosystem accounts initiatives within the framework of the United Nations System of Environmental and Economic Accounting[21]. In this way, it would not only be possible to better understand the contribution that the blue economy makes to coastal economies, but also to make progress in accounting systems for common resources in the Southeast Pacific region.

Recognising the impossibility of summarising the complexities outlined here in a single statistic, there is potential for the development of additional information to support decision-making, the challenge being its organisation and systematisation, especially for those ecosystem services for which markets do not exist (Fleurbaey and Blanchet, 2013). In this way, informed decisions can be made regarding conflicting uses and the balance between current and future uses (Fenichel et al., 2020).

In addition to advancing understanding of the direct and indirect effects that activities in ABNJ (and the ocean in general) have on production and employment in coastal economies, complementary accounting developments will be needed that recognise the value of the natural environment and allow us to look not only at economic outcomes (i.e. what is extracted or exploited), but also to examine in more detail the natural wealth that produces and sustains them, their stability and the distribution of ultimate benefits (Fenichel et al., 2020), both within and beyond the jurisdiction of countries.

Based on the above, the prevailing forms of governance and the possibilities of generating integrated ocean management as a central element for sustainable economic development (Winther et al., 2020) and aligning the protection of the different components of biodiversity with the ecosystem services it provides (Lindegren et al., 2018; Worm et al., 2006). However, given the extent and lack of knowledge of ABNJs, their biodiversity and high levels of connectivity, their governance is weaker than in jurisdictional areas. This highlights the importance and need for international (and regional) cooperation in coordinating efforts and developing the necessary information systems for the assessment and integrated management of BBNJ based on the best available science, building capacity and adaptive solutions, and strengthening stakeholder commitment to sustainable ocean governance (Rudolph et al., 2020; Winther et al., 2020).

5.2. Endowments and inequalities in a capitalist context

Institutional solutions and natural resource governance outcomes are not independent of countries‘ historical processes and established economic interests (Mallin and Barbesgaard, 2020). Regional and long-distance access to ABNJ reflects historical processes of technological development, fishing capacity, bilateral and international agreements, actual development capacities, as well as influences on State and private policies that shape a heterogeneous landscape when assessing the socio-economic linkages between the vast ABNJ of the southern oceans and the realities on the continental margins of the region: countries peripheral to the hubs of the world‘s major economic, political and military powers.

Deep-sea fishing was boosted by technological developments after World War II, where engines and cold storage capacity allowed access to distant fishing grounds. The economic recovery policies of that era, as well as the overexploitation of coastal stocks, led to increased fishing effort in the ABNJ. As such, these policies have tended to overexploit the absence of effective governance mechanisms and strong endow-

21 For more information see https://seea.un.org/ecosystem-accounting

ment and consumption asymmetries (Carmine et al., 2020; Jacquet et al., 2013; Berkout et al., 2018), thereby re-establishing social and natural relations, furthering commodity exploitation (Longo et al., 2015; Gephart and Pace, 2015).

These differences ultimately translate into inequalities in access to funding or to the relevant instruments that allow for the development and deployment of capacities in the ABNJ. These advantages reinforced by the dynamics international currencies on which global trade and finance are based, favoring the countries which issue the currency and deepening the already existing inequalities in participation and access. Thus, the regional benefits of ocean and conservation activities cannot be directly assimilated from global approaches, nor can regional impacts be extrapolated to those that give rise to global frameworks for action. Furthermore, the ABNJ constitute an open-access global commons, hosting species of high commercial value and cultural tradition from diverse regions.

Moreover, given the high technological and capital requirements for accessing resources in the ABNJ, their exploitation and development results in significant economic inequalities and the concentration of benefits in a small group of countries and actors with the economic power to develop productive activities in these areas (McCauley et al., 2018; Blasiak et al., 2020), on which the transition towards a sustainable use of the ocean also depends to a large extent (Österblom et al., 2017; Jacquet et al., 2013). Probably the most illustrative examples of this discussed in this report are the case of BASF in relation to marine genetic resources and MAERSK, a company that, being the main shipping company with activities in the ports of the Southeast Pacific, is also a relevant actor in the development of underwater mining.

On the other hand, the distribution of economic outcomes depends on the initial endowment of participants and influences the definition of political power and thus institutional frameworks, which in turn defines the way in which benefits and opportunities are distributed in society (Acemoglu et al., 2005). This is particularly relevant in the Latin American context as institutional processes are reflected in industrial policies and innovation possibilities (key in the framework of the blue economy and sustainable development, especially in relation to Sustainable Development Goal (SDG) 14), whose performance in the region has been disappointing compared to other emerging economies, largely due to approaches to development (Palma, 2010).

Thus, the size of the actual and especially the potential socio-economic benefits of the area will depend on existing economic interests and capital endowments, but also on the way in which the CPPS countries‘ share of the benefits is structured. This, be it in the ownership and development of future initiatives, the collection of rents through royalties, or in capacity building, research, and technological advances in the area within the framework of an eventual agreement, especially considering the regional importance of ABNJ and its influence on the processes of global change.

However, given the inequalities in physical, financial and capacity endowments, it will be necessary to take into account and eventually enshrine in the BBNJ agreement principles to advance outcomes that are not only ambitious in relation to conservation and economic development goals, but also in terms of fairness in relation to both access to benefits and the environmental costs associated with human activities in ABNJ (Österblom et al., 2020). Table 3 below presents the top ten risks and recommendations in this regard identified by Bennett et al. (2021), which could guide such efforts.

Table 3: 10 social injustices of blue growth and 10 recommendations for fairly advancing blue growth, from James et al. (2021).

10 social injustices of blue growth	10 recommendations to fairly advance blue growth
1. Ocean dispossession, displacement and grabbing	1. Recognise and protect spatial and resource tenure and access rights
2. Socio-environmental justice concerns	2. Take a precautionary approach to reduce pollution and ensure that environmental costs are not borne by marginalised populations
3. Environmental degradation and reduced availability of ecosystem services	3. Minimise development impacts on habitats, resources and ecosystem services.
4. Impacts on the livelihoods of small-scale fishers	4. Consider and safeguard the access rights and livelihoods of small-scale fishers
5. Loss of access to marine resources needed for food security and welfare	5. Maintain and promote access to marine resources necessary for food security
6. Unequal distribution of economic benefits	6. Develop policies and mechanisms to seek and ensure the equitable distribution of the benefits
7. Social and cultural impacts of developing the ocean	7. Monitor, mitigate and manage the social and cultural impacts of ocean development
8. Marginalisation of women	8. Recognise, include and promote the equal role of women in the ocean economy
9. Human and indigenous rights abuses	9. Recognise and protect human and indigenous rights
10. Exclusion from decision-making and governance	10. Develop inclusive planning and governance for ocean development

6. Synthesis and outlook – the Southeast Pacific, the BBNJ Agreement, and the 2030 Agenda for Sustainable Development

6.1. Actual and potential effects - costs and benefits

The following is a description of the current situation and prospective scenario for the Southeast Pacific in regard to BBNJ as well as a potential legally binding instrument.

Thus, Table 4 details the costs, benefits and uncertainty associated with the current scenario (globally and regionally) and the possible effects of an agreement in relation to ecosystem services and existing economic interests in the ABNJ.

Table 4: Current and potential scenarios - costs, benefits, and uncertainties, from baseline scenarios and with a BBNJ agreement

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Provisioning (biotic)	**Fisheries**	↗ Source of income, employment, and protein for a sector of the world's population. ↗ Most of the harvest and income from ABNJs goes to wealthy countries - inequitable exploitation. ↗ Ecosystem degradation due to overfishing and fishing gear, including impacts on EEZs. ↗ More than half of the fishing grounds in ABNJ would not be profitable at current exploitation rates, without subsidies and/or low labour compensation. ↗ The socio-economic (including human rights) effects of crimes, including organised crime and drug trafficking are perpetuated along the value chain.	↗ Actual and potential source of income and employment for the population. ↗ Reduction of protein obtained from fisheries in EEZs due to exploitation in ABNJ. ↗ Ecosystem degradation due to fishing in ABNJ and fishing gear (trawling in deep water, incidental catches, actions due to loss of top predators). ↗ Uncertainties due to differences in incidence and dependence on ABNJ and future impacts. ↗ Dissimilar criteria in the assignment of the classification of artisanal and industrial fisheries by countries and organisations.	↗ Tools, e.g. area-based management tools to ensure sustainable exploitation. ↗ Increased food security. ↗ Improved governance and enforcement of fisheries laws. ↗ Strengthening of monitoring and oversight mechanisms. ↗ Increased means (vessels, equipment), capacity and opportunities to access ABNJ.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Provisioning (biotic)	**Fisheries**	↗ Inefficient exploitation on the high seas resulting from market distortions caused by subsidies and IUU fishing. ↗ Loss of ecosystem resilience resulting from the removal of key species.	↗ The industrial processing of catches in the ABNJs by the companies that process them in the region, particularly in Ecuador. ↗ The number of national and foreign companies in the area, with a higher proportion of women taking part in these activities. ↗ Economic losses for coastal countries as a result of fishing by long-distance fleets close to EEZ boundaries. A clear example of the tension around this links is the risk of overexploitation by long-distance (subsidised) fleets operating in the area, which affects the sustainability of local fleets in CPPS countries. ↗ Climate change has an impact on economically important regional fisheries (e.g. tuna and horse mackerel). ↗ The social context in Chile favours policies in favour of artisanal fishermen, such as the recently approved ban on industrial squid fishing. However, there is a risk that they may be ineffective, as productivity gains could be captured by long-distance (subsidised) fishing.	

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Provisioning (biotic)	**Marine genetic resources**	↗ The growing commercial interest in MGRs is reflected in the increase in related patent claims. ↗ Patent registration is dominated by key players: 84% of all patents registered by 221 single companies located mainly in the Global North and 47% by a single transnational key player. ↗ Insufficient evidence of assistance relating to the nature and scale of commercial interest in MGRs - the potential for commercialisation of ABNJ MGRs is largely speculative and; it is in the hands of a few distinguished key players. ↗ Upfront costs in capa city and access to MGRs with potentially long investment returns and risk. ↗ Uncertainty associated with future profitability. ↗ Monetary benefits, e.g. access to data, samples, participation in collaborative research. ↗ Progress in human knowledge and better understanding of the natural environment (new properties and uncertainty scenarios).	↗ Risk of exclusion from access to genetically modified MGRs as a result of patents and private companies in rich countries. ↗ Disparities and heterogeneity in scientific knowledge and resources for the exploration and study of MGRs in ABNJ. ↗ Disadvantages in relation to endowments and research programmes. ↗ The EU's role as a global player in the development of the EU's economy is not only a matter of the wealthy countries' companies, but also of regional/ national initiatives. ↗ Alternatives for significant changes, conditioned by pre-established visions and agreements.	↗ Increased collaboration in marine scientific research. ↗ Allowing for the discovery of new vaccines and medicines. ↗ Licenses for scientists. ↗ Clearing-house mechanism for access to scientific data. ↗ Access to data; tracking and tracing mechanism. ↗ Transfer of knowledge, skills, and marine technologies to access ABNJ. ↗ Monetary benefits (if any). ↗ Fair benefit-sharing regimes.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Provisioning (abiotic or independent of ecosystem state)	**Deep-sea mining (potential)**	↗ Economic benefits for the sponsoring states and companies. ↗ Job creation and growth for the states participating in the sector. ↗ Increased access for developed countries and individual companies in the Global North. ↗ Widening the economic gap. ↗ Irreversible impacts on biodiversity; the extent of impacts on the environment is largely unknown. ↗ Difficulty in attributing value to ecosystems and associated species, and to agree on an equitable distribution of revenues that accounts for intergenerational equity. ↗ Limits efforts towards possible reuse and recycling of resources. ↗ Inequalities in access and ability to participate in deep-sea mining. ↗ The lack of an appropriate framework for environmental impact assessments in the water column and in the surface could lead to significant ecological risks, when taking into account the importance of ecological connectivity for the countries in the region. ↗ Uncertainties related to new uses of materials and their socio-economic consequences (costs and/or benefits).	↗ The future development of mining in ABNJ in the Southeast Pacific will depend to a large extent on foreign capital and knowledge. ↗ Lack of national policies and resources to encourage deep sea mining could lead to a loss of opportunities in this activity. ↗ Future risks for countries in the region that depend on revenues from the mining sector; as deep-sea mining develops, it could provide a new source of competition, enhance market shifts and generate a loss of markets for the countries' exports. ↗ The high barriers to entry to this industry, such as the high requirements of capital and advanced technologies, could exclude coastal from participating and benefiting. ↗ Mining in ABNJ could be developed without the participation of coastal countries, while impacts on biodiversity will have repercussions on the region's ecosystems.	↗ Contributing to a fair and equitable royalty regime in line with the principles of the „common heritage of mankind". ↗ Contribute to the development of an issue-oriented mining code, e.g. underwater environmental liability. ↗ Environmental impact assessments for sustainable management. ↗ Greater legal certainty and opportunities for accessing ABNJ in general could threaten economic activities dependent on the region's ecosystems.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Regulation and maintenance	**Waste disposal**	↗ The economic cost of waste imposes costs on current and future generations. ↗ Source of toxic contamination for biodiversity and human health. ↗ Impacts biodiversity through entanglement or ingestion of debris, facilitating the transport of organisms through marine debris, providing new habitats for colonisation and through effects at the ecosystem level. ↗ Includes ballast water discharged by ships; they may contain non-indigenous species not native to the area that could cause great ecological and economic damage to aquatic ecosystems.	↗ The economic cost of waste imposes costs on current and future generations. ↗ Source of toxic contamination for biodiversity and human health. ↗ Impacts biodiversity through entanglement or ingestion of debris, facilitating the transport of organisms through marine debris, providing new habitats for colonisation and through effects at the ecosystem level. ↗ Includes ballast water discharged by ships; they may contain non-indigenous species not native to the area that could cause great ecological and economic damage to aquatic ecosystems.	↗ No process that generates waste that cannot be safely disposed of by the environment should be permitted. ↗ Pollution prevention through proper disposal and waste reduction. ↗ The face and public image of consumerism needs to be changed. ↗ It is necessary to consider the concept of waste as an inefficiency of the production process; the concept of circular economy to be incorporated. ↗ Free-riding producers must be identified and held responsible for negative externalities generated.
	Water circulation	↗ Meditation of flows. ↗ Transboundary transportation of marine debris, litter and contamination causing adverse effects on biodiversity and human health. ↗ Uncertainties in relation to future circulation scenarios and the productivity of the oceans such as increased frequency of extreme events. ↗ Recognition of the importance of the role of oceans in climate regulation leads to more funding for research. ↗ Mitigates the impact of climate change. ↗ By absorbing excess heat, it increases the volume of water with possible effects on coastal	↗ The upwelling in the Southeast Pacific is further contributing to heat absorption	

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Regulation and maintenance	**Climate regulation**	↗ Absorption of excess heat; helps to mitigate the effects of climate change. ↗ The economic benefits and valuation of the regulatory services provided by ABNJs associated with climate regulation are extremely difficult to quantify.	↗ Upwelling in the Southeast Pacific further contributes to the absorption of heat.	↗ Reduction or disappearance of carbon-intensive industries and productive activities. ↗ Climate legislation ensures the redistribution of subsidies, grants and funds that promote a just transition.
	Carbon sequestration and storage	↗ The ocean contains about fifty times more CO2 than the atmosphere, acting as an atmospheric carbon sink, slowing climate change, but is close to its carbon absorption capacity. ↗ Rising levels of CO2 in the atmosphere, produced mainly by the burning of fossil fuels, are causing the acidic pH in the oceans to increase because of its absorption. ↗ The identification of suitable sites for the storage of captured CO2 depends to a large extent on future research. ↗ The value of regulatory services provided by ABNJ in relation to storage of carbon is difficult to quantify.	↗ Increase in the minimum oxygen area and net positive GHG emissions. ↗ Magnitude of contribution and spatial distribution dependent on regional processes, in particular El Niño and La Niña. ↗ High uncertainty about the impact of mesopelagic fisheries on the active carbon pump. ↗ Uncertainties relating to the evolution of biological processes resulting from the alteration of the physical and chemical environment (e.g. 1/3 of the ocean carbon sequestration comes from microbes).	↗ the rise in global temperatures to below 2 degrees Celsius. ↗ Innovative schemes for voluntary offset and mitigation mechanisms (e.g. carbon credits). ↗ Funding for conservation strategies for highly migratory megafauna. ↗ Environmental Impact Assessment covering the water column.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Supporting	**Habitat**	↗ Biodiversity supports food security and sustained livelihoods through genetic diversity. ↗ Biodiversity contributes to modern medicine, advances in human health research and treatment. ↗ Many species face a continuing threat of extinction. ↗ The extinction of one species can negatively affect other species or even entire ecosystems. ↗ Biodiversity loss limits and disrupts the possibilities to better understand the functioning of the oceans and seas. the provision of ecosystem services. ↗ Measures are being taken to increase the protection of the ocean and its biodiversity, to move towards more sustainable management. ↗ Spatial tools for the identification of areas of special ecological and/or biological importance, e.g. EBSAs on the basis of scientific criteria under the Convention on Biological Diversity, other areas of ecological importance in ABNJ around the world identified by other organisations, including BirdLife International, and others. The project has been supported by the World Bank, a partner of the STRONG High Seas	↗ Uncertainty about changes in the composition and distribution of biodiversity, because of fishing activities and climate scenarios. ↗ Uncertainty about the capacity of species to adapt genetically, because of environmental pressures. ↗ Increasing recognition of the importance of the biodiversity of seamounts and upwelling areas with high levels of endemism in the region, which support the functions of the ecosystem in the Southeast Pacific	↗ Joint efforts and global policies to protect biodiversity, especially regional agreements to manage ABNJ neighbouring EEZs. ↗ Measures, instruments, and mechanisms benefit from coordinated action at national, regional, and international levels. ↗ Innovative financing and capital markets, e.g. blue bonds, biodiversity offsets as a catalyst for innovation, and conservation efforts.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Supporting	**Habitat for the species**	↗ Habitat preservation benefits biodiversity. ↗ A slight alteration in a natural habitat could trigger a domino effect, damaging the natural habitat. The whole ecosystem (tipping points). ↗ Habitats are devastated by destructive activities such as fisheries, seabed mining, pollution, among other causes. ↗ Habitat loss is a challenge for all species. ↗ Migratory species are particularly vulnerable to habitat destruction because their habitat is in different sectoral areas.	↗ Increasing recognition of the importance of seamounts in the region as critical habitat for migratory species (e.g. Nazca, Salas y Gómez). ↗ Increased recognition of the importance of sites along the water column, influenced by oceanographic processes that support biological communities such as skipjack tuna. ↗ There is no spatial planning for habitat conservation in ABNJ by regional fishing entities.	↗ Marine protected areas, marine reserves, zoning, and regulation of development. ↗ Marine spatial planning in ABNJ as a catalyst for conservation efforts.
Cultural	**Research and education**	↗ Reduced awareness of the benefits and costs of conservation and sustainable exploitation of ABNJ; albeit limited to a high-level target audience and not to the public. ↗ Increased fundraising opportunities related to high-profile blue economy sectors (with the involvemen ↗ Limited to highly developed regions. ↗ Inequalities in access to research funds.	↗ World-class research in the area and the potential for further development is constrained by limited funding and spending of CPPS countries. ↗ Inequalities in knowledge, as well as equipment and other resource endowments, limit access to ABNJ. ↗ Little dissemination of scientific information of ABNJ in the region. ↗ Lack of regional initiatives to explore and study the ABNJs of the Southeast Pacific.	↗ Promoting coordination and exchange of information and the creation of international and cross-sectoral capacity. ↗ Possibility to set up specialised curricula and research, technology, and development projects with universities and regional research centres. ↗ Creating conditions for innovation and investment.
	Recreation, leisure and tourism	↗ Increased sources of income for local economies from tourism related to migratory species.	↗ Increased development of tourism activities of special interest in coastal areas around migratory species in the ABNJ (e.g. sharks in the Galapagos, whale watching in Peru and Chile).	↗ The lasting benefits of tourism and recreation schemes are well designed. ↗ Possibility of agreements between several countries to facilitate tourism.

Ecosystem services	Socio-economic interest	Global scenario without BBNJ agreement (costs and benefits)	Regional scenario without BBNJ agreement (costs, benefits, and uncertainty)	Regional scenario with BBNJ agreement; possible positive and negative outcomes
Cultural	**Recreation, leisure and tourism**	↗ Job creation and entrepreneurship. The protection of ABNJ biodiversity, including migratory species of interest to wildlife-based marine tourism, safeguards the sustainability of the activity. ↗ Pressure on natural re sources.	↗ Increase in cruise tourism (before the COVID pandemic). ↗ Potential development of recreational fishing for large fish, especially in the continental zone up to the Galapagos, in front of the Equator. ↗ Potential development of deep-sea tourism to explore the deep sea habitats. However, it is not clear that this would necessarily involve coastal countries if they are deployed in ABNJ.	↗ Joint tourism management strategies for migratory species. For example, the Martillo shark seen in the Galapagos (Ecuador), Coiba (Panama) and Cocos (Costa Rica); or whales.
Other	**Maritime Transport**	↗ Enables the growth of international trade. ↗ Shipping volume and routes are driven by global economic factors and industry operating conditions, rather than an ecosystem approach. ↗ Automation of industry could affect jobs in coastal countries.	↗ Increased traffic in the area could have potential effects on wildlife (e.g. increased marine mammal colonies). ↗ Transport of marine invasive species in bilge waters.	↗ Potentially better organised in consideration of the BBNJ by the authorities based on better spatial planning and assessments of environmental impacts.
	Submarine cables	↗ Facilitating global communication through optical fibre. ↗ Risk of infrastructure deterioration (voluntary or non-voluntary). ↗ Deterioration of local habitats; loss of	↗ The new trans-Pacific submarine cable linking Asia and Chile via New Zealand will improve connectivity in the region.	↗ It should not interfere.
	Maritime security	↗ Increased level of security instils confidence in investors and other private sector stakeholders, leading to social and economic development.	↗ Asymmetries in the possibilities of safeguarding and monitoring of ABNJ and uncertainty regarding the future and geopolitical implications.	↗ Possible increase in maritime safety work and coordination.

6.2. Linkages between conservation, sustainable use of biodiversity in ABNJ and the SDGs

The socio-economic activities that take place in ABNJ are of particular importance in advancing the Sustainable Development Goals (SDGs) adopted as part of the 2030 Agenda, in particularly in relation to Goal 14 which seeks to conserve and sustainably use the oceans, seas and marine resources. SDG 14 builds on different commitments and targets such as the Johannesburg Plan of Implementation (target 14.4 on sustainable fisheries) and the Convention on Biological Diversity and the Aichi Targets (target 14.5. on the protection of coastal and marine areas).

The SDGs are interlinked through synergistic interdependencies, representing complex interactions between social, environmental, and economic dimensions. Given the ocean's central role for biodiversity and climate regulation, SDG 14 is essential to achieving the other SDGs relating to environmental and socio-economic issues, as presented in Table 5 below.

Table 5: Linkages between socio-economic activities in ABNJ and the SDGs.

Ecosystem services	Socio-economic interests	Link to SDG 14 targets	Links to other SDGs	Implications for conservation and sustainable use of ABNJ
Provisioning (biotic)	**Fisheries**	↗ 14.4 Restore fish stocks, end IUU and destructive fishing practices ↗ 14.6 End perverse fish subsidies ↗ 14.7 Benefits for small island developing States (SIDS) and least developed countries (LDCs) ↗ 14.b Access for small-scale artisanal fishers to marine resources and markets	↗ SDG 1 No poverty ↗ SDG 2 Zero hunger ↗ SDG 8 Decent work and economic growth ↗ SDG 10 Reduced inequalities ↗ SDG 12 Sustainable consumption and production ↗ SDG 17 Partnerships for the Goals – Trade 	↗ Promote sustainable fisheries management as a key food source, securing food security and coastal livelihoods that rely directly on fisheries ↗ Ensure decent working conditions and respect of labour rights ↗ Ensure that benefits from ABNJ resources are equitably accessed and shared ↗ Increase supply to cover national demands and boost exports through sustainable fisheries management

Ecosystem services	Socio-economic interests	Link to SDG 14 targets	Links to other SDGs	Implications for conservation and sustainable use of ABNJ
Provisioning (biotic)	**Marine genetic resources**	↗ 14.a Scientific knowledge and technology transfer	↗ SDG 3 Good health and well-being ↗ SDG 4 Quality education ↗ SDG 10 Reduced inequalities ↗ SDG 16 Peace, justice and strong institutions	↗ Increase scientific knowledge, develop research capacity and transfer marine technology ↗ Enable the discovery of new vaccines and drugs from marine species ↗ Ensure that benefits from ABNJ marine genetic resources are equitably accessed and shared
Provisioning (abiotic or independent of ecosystem state)	**Deep-sea mining**	↗ 14.1 Reduce marine pollution	↗ SDG 3 Good health and well-being ↗ SDG 9 Industry innovation and infrastructure ↗ SDG 10 Reduced in equalities ↗ SDG 12 Sustainable consumption and production	↗ Ensure that benefits from ABNJ resources are equitably accessed and shared ↗ Shift towards production processes that protect and restore ocean health ↗ Reduce and ultimately eliminate waste streams that enter marine ecosystems ↗ Apply precautionary approach in the management of activities that pose environmental risks

Ecosystem services	Socio-economic interests	Link to SDG 14 targets	Links to other SDGs	Implications for conservation and sustainable use of ABNJ
Regulating and maintenance	**Waste disposal**	↗ 14.1 Reduce marine pollution	↗ SDG 3 Good health and well-being ↗ SDG 9 Industry innovation and infrastructure ↗ SDG 12 Sustainable consumption and production	↗ Reduce and ultimately eliminate waste streams that enter marine ecosystems
	Climate regulation **Carbon sequestration and storage**	↗ 14.3 Minimize ocean acidification	↗ SDG 2 Zero hunger ↗ SDG 3 Good health and well-being ↗ SDG 13 Climate Action	↗ Recognizing the ocean's critical role in the earth's carbon cycle and climate regulation, and intrinsic linkages to biodiversity
Supporting	**Biodiversity** **Habitat for species**	↗ 14.2 Management of coastal and marine ecosystems ↗ 14.5 Area-based conservation measures	↗ SDG 1 No poverty ↗ SDG 2 Zero hunger ↗ SDG 13 Climate Action ↗ SDG 15 Life on Land	↗ Apply ecosystem-based approach to the management of ABNJ ↗ Apply ABMTs to ABNJ to sustainably manage and conserve marine biodiversity and ecosystems and safeguard ecosystem services (provisioning, regulatory and support) to achieve SDG 1 and 2. Note that SDG 14.2.1 and SDG 14.5.1 indicator refer to national EEZ

Ecosystem services	Socio-economic interests	Link to SDG 14 targets	Links to other SDGs	Implications for conservation and sustainable use of ABNJ
Cultural	**Research and education**	↗ 14.a Scientific knowledge and technology transfer	↗ SDG 4 Quality education ↗ SDG 5 Gender equality ↗ SDG 10 Reduced inequalities ↗ SDG 16 Peace, justice and strong institutions ↗ SDG 17 Partnerships for the Goals – Capacity building	↗ Enhance international support for implementing effective and targeted capacity-building in developing countries, including through North-South, South-South and triangular cooperation ↗ Improve coordination among existing mechanisms through facilitation of marine technology transfer ↗ Encourage gender equity through dedicated efforts to increase opportunities for qualified women from developing states to participate in marine scientific research programmes ↗ Recognizing that oceans are the most globally shared natural resource, foster integrated actions across sectors and boundaries
	Recreation, leisure and tourism	↗ 14.2 Management of coastal and marine ecosystems ↗ 14.5 Area-based conservation measures	↗ SDG 3 Good health and well-being ↗ SDG 8 Decent work and economic growth	↗ Ensure the sustainability of wildlife-based marine tourism, its conservation and socio-economic benefits

Ecosystem services	Socio-economic interests	Link to SDG 14 targets	Links to other SDGs	Implications for conservation and sustainable use of ABNJ
Other (ecosystem-state independent)	**Maritime transport**	↗ 14.1 Reduce marine pollution	↗ SDG 9 Industry innovation and infrastructure ↗ SDG 13 Climate Action	↗ Implement measures to lower greenhouse gas emissions from shipping ↗ Implement measures to prevent discharge from ships; oil, sewage, plastic, ballast waters
	Submarine cables	↗ 14.1 Reduce marine pollution	↗ SDG 9 Industry innovation and infrastructure ↗ SDG 12 Sustainable consumption and production ↗ SDG 17 Partnerships for the Goals – Technology	↗ Enhance North-South, South-South and triangular regional and international cooperation ↗ Access to science, technology and innovation ↗ Enhance the use of enabling technology, in particular information and communications technology
	Maritime security	↗ 14.4 Restore fish stocks, end IUU and destructive fishing practices	↗ SDG 8 Decent work and economic growth ↗ SDG 16 Peace, justice and strong institutions	↗ Reinforce maritime security to monitor and prevent blue crimes, in particular IUU which is considered a key security issue in the region

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Institute for Advanced Sustainability Studies e. V. (IASS)
Berliner Strasse 130
14467 Potsdam
Germany
Tel: +49 (0) 331-28822-340
Fax: +49 (0) 331-28822-310
E-Mail: media@iass-potsdam.de
www.iass-potsdam.de

Contact

STRONG High Seas Team at IASS: stronghighseas@iass-potsdam.de

ViSdP

Prof. Dr Mark G. Lawrence, Managing scientific director

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About the STRONG High Seas project

The STRONG High Seas project is a five-year project that aims to strengthen regional ocean governance for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction. Working with the Secretariat of the Comisión Permanente del Pacífico Sur (CPPS; Permanent Commission for the South Pacific) and the Secretariat of the West and Central Africa Regional Seas Programme (Abidjan Convention), the project will develop and propose targeted measures to support the coordinated development of integrated and ecosystem-based management approaches for ocean governance in areas beyond national jurisdiction (ABNJ). In this project, we carry out transdisciplinary scientific assessments to provide decision-makers, both in the target regions and globally, with improved knowledge and understanding on high seas biodiversity. We engage with stakeholders from governments, private sector, scientists and civil society to support the design of integrated, cross-sectoral approaches for the conservation and sustainable use of biodiversity in the Southeast Atlantic and Southeast Pacific. We then facilitate the timely delivery of these proposed approaches for potential adoption into the relevant regional policy processes. To enable an interregional exchange, we further ensure dialogue with relevant stakeholders in other marine regions. To this end, we set up a regional stakeholder platform to facilitate joint learning and develop a community of practice. Finally, we explore links and opportunities for regional governance in a new international and legally binding instrument on marine biodiversity in the high seas.

Project duration: June 2017 – May 2022
Coordinator: Institute for Advanced Sustainability Studies (IASS)
Implementing partners: BirdLife International, Institute for Sustainable Development and International Relations (IDDRI), International Ocean Institute (IOI), Universidad Católica del Norte, WWF Colombia, WWF Germany
Regional partners: Secretariat of the Comisión Permanente del Pacífico Sur (CPPS), Secretariat of the Abidjan Convention
Website: prog-ocean.org/our-work/strong-high-seas
Contact: stronghighseas@iass-potsdam.de

Partners of the STRONG High Seas project: