

Chapter 15

The Blue Growth Smart Specialization Challenges Towards the Restorative Economy



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Abstract The ‘blue economy’ embraces more than five million jobs and the gross added value in the second decade of this century is surpassing EUR half a trillion a year. Now when this growth even accelerates in many more sub-sectors the process goes driven in two ways. On one side, a wave of smart specialization strategies at regional and urban level is under way, in many cases incorporating the restorative economy elements. On the other side, changes just happened even without the respective strategies in the blue economy structure and challenge the established sectors. The purpose of this chapter of the book is to identify the main challenges of the smart specialization strategies at urban and regional level incorporating the blue growth elements that are met towards the restorative economy frames. The methods used are a literature and key policy documents review and some secondary data analysis over performed by the European Commission contractor investigation with reference to a project performed in the sector. As a conclusion the recommendation for sectoral specialization of the coastal areas and its cities’ economy in accordance with the innovative potential for blue growth was outlined, with the understanding it might be fragile due to the unsustainable economic activities in the seas.

Keywords Blue economy sectors · Restorative economy · Blue growth · Smart specialization · Innovation

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281

15.1 Introduction

Traditionally, the businesses associated with sea are important for the European economies and what matters more in the last decade proved to be a potential for growth and innovation. The achievement of the last Europe 2020 strategy for growth goals was substantially due to the maritime sector's improvements and innovations. Blue growth is the long-term strategy to support sustainable growth in the marine and maritime sectors as a whole. The 'blue economy' embraces more than five million jobs and the gross added value in the second decade of this century is surpassing EUR half a trillion a year. Now this growth even accelerates in many more sub-sectors (European Commission, 2017). At the same time, even higher growth is possible in a few more sectors and subsectors which were in the focus of the strategy.

The process is driven in two ways. On one side, a wave of smart specialization strategies at regional and urban level is under way, in many cases incorporating the restorative economy elements. On the other side, changes just happened even without the respective strategies in the blue economy structure and challenge the established sectors.

Those sectors include the coastal tourism, marine living resources, marine non-living resources, port activities, shipbuilding and repair and maritime transport. The field research partly is accumulated on the results of the IRISI ('Indexing the Regional Innovative Levels in the Sectors of the Economy – scenario for the identified in the ISSS four priority thematic areas for smart specialization and their positioning towards the circular economy') project financed under the Bulgarian National Scientific Fund. Each of them concerns the issues of the restorative economy either in urban development and changes in the special planning of the industrial sites related to the blue economy, and in regional aspects with the interactions of the other sectors and elements of the infrastructure serving the sustainable urban development.

The aim of this chapter of the book is to identify the main challenges of the smart specialization strategies at the urban and regional level incorporating the blue growth elements that are met towards the restorative economy frames.

15.2 The Blue Economy Problems Outline

Unlike the introduction of most terminologies in the business practice today the blue economy terminology was initially tracked in the mid-90s, when the Belgian businessman and futurist [Gunter Pauli](#) (Pauli, 2010) was asked by the United Nations to think about innovative business models of the future. For the last decade most efforts and achievements are related with the documents introduced by the European Union institutions (European Commission, 2009) before it became a focus of researchers. According to the Commission (2009), the blue economy includes economic activities that are marine based and marine related. The

marine-based activities include those undertaken in the ocean, sea and coastal areas, such as capture fisheries and aquaculture, offshore oil and gas, offshore wind energy, ocean energy, desalination, shipping and marine transport, and marine and coastal tourism. The marine-related activities use products and/or produce products and services from the ocean and marine-based activities; for example, seafood processing, marine biotechnology, shipbuilding and repair, port activities, equipment.

The blue economy-established sectors include the marine living resources, marine extraction of non-living resources, maritime transport, port activities, shipbuilding and repair and coastal tourism. While those activities are mostly traditional and profitable, a real challenge is to match them with the logic of the restorative economy and the sustainability achievements. Besides the established sectors in the blue economy, some emerging (a focus in the next section under the blue growth) and innovative sectors bring new opportunities for investment and hold huge potential for the future development of coastal communities (JRC, 2016; Roberts & Ali, 2016). While there are still many challenges to be faced, this chapter makes a step in assessing the potential of the seas and coasts in leading to sustainable economic growth and seeks to support the development of management policies that will ensure it goes in the regenerative economy direction. Hence, the importance of discussing the need to maintain healthy oceans that help preserve and increase the natural capital from which ecosystem services are produced.

Promoting the blue economy is related with substantial funding resources, but governments and coastal local authorities often do not achieve a lot to accelerate investments from public funds and the business in the blue economy, and not with the volumes that would allow the mature sectors to change or that would promote new sectors in the economy (OECD, 2016). In many cases the conditions needed for the blue growth are in relation with the circular economy (Baltov, 2016) and the sources of financing can include changes in governance and greener management of coastal areas and resources. In parallel, correcting market and policy failures through the application of scientific results integrated maritime planning (Avelina & Karim, 2015), and barriers have to be removed to restore coasts, and push entrepreneurship and new jobs (European Commission, 2009). There are funding references for restoring marine environment and infrastructure for interested in protected areas, etc. (JRC, 2016).

The idea of the blue growth is related to the promotion of economic growth, social inclusion and living standards in line with ensuring environmental sustainability of the coastal areas at the seas, oceans and rivers. It refers to the decoupling of socioeconomic development through sea-related sectors and activities from environmental degradation (European Commission, 2009). The blue economy has diverse components, including established traditional maritime industries such as fisheries, tourism and maritime transport, but also new and emerging activities, such as offshore renewable energy, aquaculture, seabed extractive activities, and marine biotechnology and bioprospecting. A number of services provided by ocean ecosystems, and for which markets do not exist, also contribute significantly to economic and other human activity such as carbon sequestration, coastal protection, waste disposal and the existence of biodiversity.

15.3 Characteristics of the Blue Growth and the Areas to be Promoted

In 2016, the Marine Investment for the Blue Economy (MARIBE) project, funded by HORIZON 2020, carried out a contextual study of blue growth sectors (details in text Box 15.1). Each sector was reviewed in terms of business life cycles as well as from a socioeconomic perspective. Taking into account a broad range of existing studies and research, nine sectors have been shown to be the most influential in the blue economy.

These sectors are mineral resources, marine food, marine biotechnology; energy; transport and trade; circular economy; marine services; tourism and recreational coastal protection. Many of the activities related to the blue economy take place upstream and downstream of one another, creating a value chain. It is important to consider these value chains in the context of the small and medium-sized enterprises' (SMEs) involvement. Many SME-related activities take place not in the core of the sector, but upstream or downstream (Baltov, 2018). In the maritime transport sector, shipping is the core activity. However, a great deal of value is added in seaports and associated services, as well as in shipyards and other supply activities that support shipping.

Another example is with the fisheries, where opportunities exist to extend the value chain both upstream (e.g. vessel support services) and downstream (e.g. processing whole fish into higher value products). The extent of the value chain will determine the total value that can be realized from a single maritime sector. Emerging technologies show that these value chains act as multipliers, triggering the introduction of new forms of production, technologies, logistics, labour processes, organizational relations and networks (Roberts & Ali, 2016).

The direct relation of the nine sectors to the following social goals focuses strongly on climate change and food security (see Fig. 15.1):

- (a) health, demographic change and well-being
- (b) food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy

Box 15.1: The MARIBE project

The project aimed to unlock the potential of multi-use of space in the offshore economy. This forms part of the long-term **blue growth** strategy to support sustainable growth in the marine and maritime sectors as a whole; something which is at the heart of the **Integrated Maritime Policy**, the EU Innovation Union and the **Europe 2020** strategy for smart, sustainable growth. The project was performed in 18 months. The project was funded by the **European Commission** and led by a consortium of 11 partners from Ireland, United Kingdom, Belgium, Spain, Italy, Malta and the Netherlands.

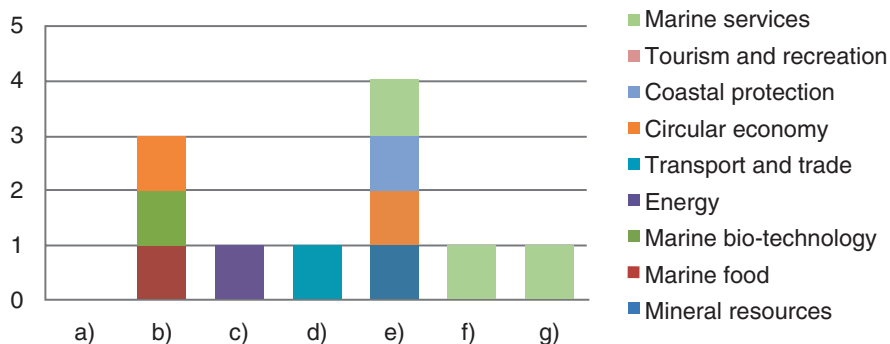


Fig. 15.1 Direct relation to social goals. (Hamza et al. 2018)

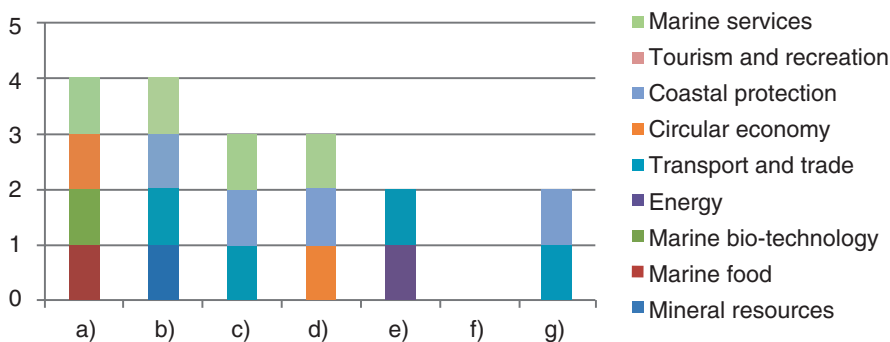


Fig. 15.2 Indirect relation to social goals. (Hamza et al. 2018)

- (c) secure, clean and efficient energy
- (d) smart, green and integrated transport
- (e) climate action, environment, resource efficiency and raw materials
- (f) Europe in a changing world – inclusive, innovative and reflective societies
- (g) secure societies – protecting freedom and security for Europe and its citizens

Indirect relations address health and food security first, followed by clean energy and smart transport (see Fig. 15.2). The tourism sector does not really address any of the social goals, though this does depend on the type of tourism. Exceptions are small-scale, sustainable and local tourism activities that address food security, resource efficiency and smart transport.

Considering one certain sea basin in Europe, towards which still less research over the blue economy issues is conducted and less investments are allocated to the blue growths elements of its economy is the area of the Black Sea. At the meeting of the experts from the Black Sea coastal countries in cooperation with marine experts from leading European marine institutes and organizations, and the European Commission in May 2018, a decision on Burgas Vision Paper was taken (Directorate-General for Research and Innovation DG RTD and Directorate-General DG Mare at

the European Commission expert group, 2018). This vision paper is considering a blue growth initiative for research and innovation in the Black Sea and according to it (Baltov, 2019), incentives for marine and maritime innovation in traditional and emerging blue economy sectors have to be created in four main categories. One is the energy with establishing renewable energy sectors such as offshore wind and waves energy converters.

Then come the aquatic living resources and food including the development of sustainable fisheries, high-tech and eco-friendly aquaculture and the biotechnology including the deriving of high-value novel products from organisms of the unique habitats of the Black Sea. The transport is including the development of sustainable safe shipping for a cleaner marine environment, and certainly the blue tourism.

The considerations and research conducted both by the DG RTD and DG Mare expert group for the Black sea (2018) and by the team of the MARIBE study were mostly following the already established in Commission documents understanding for the sectoral concentration in the blue economy (European Commission, 2013) in established and emerging industries. In a published study of The Economist (2017) over the development of the blue economy, a further description on the innovative trends in its industries were outlined (see Table 15.1). The outline is towards five sectors. Table 15.1 above gives an overview of the five sectors and their development status, as well as drivers for growth to trigger development.

Table 15.1 Overview of the five sectors of the blue economy

Sectors	Established industries	Emerging industries	Innovative trends	Drivers for future growth
Marine food	Fisheries	Sustainable fisheries	Food processing industry	Food security
	Traditional aquaculture	Freshwater aquaculture and mariculture	Coastal and shore farming of fish, crustaceans, aquatic plants, etc.	Demand for protein and fish consumption
Marine biotechnology		Biotechnology for healthcare products	Functional food	R&D in healthcare and industry
Energy	Offshore wind energy	Tidal and wave energy	Ocean thermal energy conversion	Demand for alternative energy
Transport and trade	Shipping, port infrastructure and services	E-logistics and sustainable shipbuilding	Digitization, automation and environmental technologies	Changes in logistics requirements and regulations
Tourism and recreation	Tourism and coastal development	Ecotourism and authentic experiences		Growth of tourism and coastal urbanization

The Economist (2017)

15.4 The Challenges in the Sector of the Blue Energy

By 2020, if the technological and financial challenges are met the pipeline of European projects for which information is available could reach 600 MW of tidal stream and 65 MW of wave energy capacity (JRC, 2016). Taking into account only projects that have been awarded public funds, 71 MW of tidal stream and 37 MW of wave energy capacity could be operational within the European Union (EU) in 2020.

The marine energy projects performed in European countries that have obtained support through the different funding streams (e.g. Horizon 2020, NER 300 and Innovfin) and that are expected to be operational by 2020 account for a substantial amount of wave energy production and even twice for a tidal one. Societal goals met directly are secure, clean and efficient energy (JRC, 2016). The societal goals met indirectly are the climate action, environment, resource efficiency and raw materials.

Speaking of the private investments there are generally three types of investments in offshore wind energy: project acquisition and capital ventures, company mergers and acquisitions, technology funding and advisory for financing in the three types of performance (European Commission, 2018). Merger and acquisition consulting is related to models of projects and their value, some feasibility studies and services for the implementation phase (European Commission, 2009). The investments for the last decade were EUR 1 billion.

The capital expenditure might be different starting for wave energy conversion from 10 to 50 million EUR/MW and for the tidal one at 5–20 million EUR/MW (European Commission, 2017). Now it is expected to lower to 3–6 million EUR/MW in both wave and tidal energy. Only the investors' choice will depend a lot on the governmental policies and the business orientation to the risk (Baltov, 2018). It is assumed both by the Strategic Initiative for Ocean Energy (SI Ocean, 2014) and the European Ocean Energy Association that this year already 850 MW will be installed (OEE, 2016).

15.5 Additional Challenges of Smart Specialization Concerning the Urban Development

The importance of the urban areas and cities is clear enough these days when more than 80% of gross domestic product (GDP) in Europe is associated with them, and the substantial part population and consumption of energy is spent with them (European Commission, 2018). At the same time, the blue economy sectors are in many cases situated close or right into these urban areas and they are extremely important for the business dynamics in Europe and generation innovation across the boundaries and changing the other sectors too.

The urban life with its dimensions – economic, social, environmental and cultural – are supposed to be a success and intertwined in urban development just

through an integrated approach (Beel, Jones, & Jones, 2016). Concerning the physical renewal of cities certain actions must be combined in order to promote economic development, education, social inclusion and environmental protection. Strong partnerships between industry, civil society and different levels of government are needed further. Five definite policy objectives are to be set and they are smarter, greener, connected and social Europe, further with a new common goal Europe to cross closer to citizens and to support investment strategies that are locally developed.

But there are also places where persistent problems, such as unemployment, segregation and poverty, are at their most severe. Urban policies therefore have wider cross-border significance, which is why urban development is central to the EU's regional policy. Integrating urban planning and marine spatial planning must be a priority for blue economy. Bringing together spatial planning and integrated coastal zone management through the development of integrated coastal and marine spatial plans might be the steps to guide national government policy-makers, local government officials, marine protection experts and other civic stakeholders.

The key for the cohesion policy of EU in the last period of 2014–2020 is the urban dimension. More than half of the resources of the European Regional Development Fund (ERDF) in the last period are to be spent in urban areas. And in the year of the pandemic even higher amounts might be supposed with the next couple of years with implementation of the projects planned in 2019 and 2020. Not less than EUR 10 billion will be directly spent to integrated sustainable urban development strategies (European Commission, 2018), and those are ERDF funds. More than 700 cities and agglomerations are to be supported for the implementation of integrated strategies for sustainable urban development that were designed in the period.

A decade ago, some 12 priority themes of European and urban importance have been set (European Commission, 2009). They were the epicentre for partnerships identifying problems and recommending solutions through action plans. The action plans are focused to the EU as a whole, the Member States and the cities. On this basis the Urban Agenda is regarded as a coordinated approach to deal with the urban dimension of European, governmental and regional policies and legislation. As some are specific priority topics under special partnerships, the Urban Programme is supposed to improve the quality of life in urban areas (Baltov, 2016). Under it new working methods are regarded to maximize the growth potential of cities and successfully to address social challenges and promote cooperation between the Member States and their cities. The European Commission and other stakeholders are set through it further to stimulate growth, vitality and innovation in Europe's cities (Jones & Jones, 2016). As a referral to the Urban Act the BlueAct (the information on is in the text Box 15.2) is financed exactly under its mechanisms from the EU ERDF funding, and a clear promotion of the cities and regions with active blue economy sectors.

The action plans normally will be proposals under the European Strategic Investment Funds (ESIF), for promoting investments in innovation (Jones & Jones, 2016). The Urban Agenda for the EU at the same time is to put the frames and thus to expect the number and size of cities are increasing by the relative share of urban population, as well as to a change in the functions of cities towards spreading of

Box 15.2: The BluAct Network

BluAct was started as a project of the city of Piraeus' Blue Growth Initiative, an entrepreneurship competition promoting incubation to regional businesses aimed at innovation and job creation. Then it was transferred in a network of several European port cities with Piraeus, Ostend, Galati, Mataro, Burgas, Matosinhos and Salerno. The good practices in entrepreneurship were promoted to blue economy and a track for the success stories of the business start-ups was created. The approach was to set up local support groups for Urbact and engage local and other stakeholders by launching the blue economy. This BluAct initiative aims to achieve far-reaching results in the cities involved and other potential cities in the regions.

urban lifestyle (Beel et al., 2016; Brown, Baltov, et al., 2018), In regard to this, the 'smart city' model that arises meets the challenges facing the developing technological and environmental changes. The formulation of contemporary policies to solve social, technological and environmental issues is the main challenge to the development and management of smart cities. They must simultaneously deal with economic development, urbanization and the creation of public services, poverty reduction, environmental protection and socialization of cultural heritage (Kipfer & Wirsig, 2004). To set this 'mechanism' in motion, it is necessary to unite societies (the citizens), institutions, academia, non-governmental organizations (NGOs) and businesses around the great possibilities of new technologies in building a long-term vision for sustainable development of modern cities.

Contemporary digital technologies lead to globalization, help solve environmental problems, necessitate the emergence of new business models and create conditions for significant regional differences in the living standards of the population. A need arises to devise strategies for achieving a balanced and sustainable economic and social development of regions and for overcoming the existing intra-regional and inter-regional disparities (Jones & Jones, 2016; Kipfer & Wirsig, 2004).

The design, building and functioning of smart cities provides the opportunity to come up with effective solutions for optimal utilization and saving of energy, reduction of the consumption of non-renewable resources, control of environmental waste, ensuring sustainable development and optimization of the efficiency of urban systems, that leads to increasing the quality of life of the populations.

15.6 Financing and Business Models on the Blue Energy

The Strategic Energy Technology Plan (SET-Plan) of the EU (European Commission, 2009) is supposed to put impetus among the EU-funded programmes for ocean conversion of energy that is in the frames of the European Economic Research Area

(EERA) – namely the New Entrants’ Reserve (NER 300). Three ocean energy projects were awarded around 60 million EUR in total under the first round of the NER 300 programme, which will enable the demonstration of arrays after the year 2016 (European Commission, 2017; Johnson, Dalton, & Masters, 2018). The Action Plan for the Atlantic Ocean area had a definite impact up to now (European Commission, 2013; Johnson et al., 2018).

The Ocean Energy Europe reports 124 million EUR to ocean energy projects between 2005 and 2014, almost 14 million EUR per year (OEE 2016). Now the Horizon 2020 (H2020), the EU’s research and innovation programme, aims to address important societal challenges including clean energy and marine research. As such, it is a powerful tool that can drive the ocean energy sector towards industrialization, creating new jobs and economic growth. In the period 2014–2015, the H2020 programme has funded over 60 million EUR (Johnson et al., 2018; Magagna, Monfardini et al., 2016) of R&D projects in wave and tidal energy. Thirty million EUR of which in demonstration funding for achieving low carbon emissions (LCE 3 and 12). For 2016–2017, a total of 22.6 million EUR was awarded for ocean energy-specific calls, 9.8% of LCE budget. A further 35 million EUR was allocated to blue growth and co-funded calls, which include ocean energy (Johnson et al., 2018).

The main support is structured in two basic approaches. One is the push approach when the grants and certain equity instruments are provided. The second is the pull approach when tariff and mechanisms for revenue stimulus are designed. The pull approach for wave and tidal energy attracts financial support schemes similar to feed-in tariff and renewable obligations (JRC, 2016). Feed-in tariffs are the most common support mechanisms, and are also currently the most popular and sought-after mechanism by investors (European Commission, 2009). At an EU level other available instruments are the Innofin portfolio of blended capital and advisory – provided by the European Investment Bank and the ERDF. Through both of the funding mechanisms the idea is to channel the funding in demonstration type projects. The initiatives for collaboration in regions then will upgrade the creation of marine energy clusters that are to be bones to the supply chains in Europe.

Partly due to the access to the EU funds that were still available in 2020 to the UK proved to have the most advanced support schemes for the “blue” energy sector. For the projects in the last few years its beneficiaries relied mostly on contract for different types of market support (Department of Energy and Climate Change, 2014). The wave and tidal energy conversion for the United Kingdom is assumed to provide higher certainty and positive effects. Those contracts for difference offer a fixed price above the market price for electricity, guaranteed for a period of time. On the other side, the contracts are supposed to perform with less spending and to reduce the project investments.

The technology push approach for wave and tidal energy conversion relates to grants and equity from private investors. The potential in front of them is enormous, the exploitable energy resources are not only in the seas in European equatorial but also in the oceans. This means the possible markets for the conversion energy from the seas are to be opportunities for sectors in the blue economy and also the

manufacturing, construction, etc. Only the uncertainty in future costs is tough to estimate and the market opportunities remain risky.

The design of wave energy conversion projects is problematic if considering some technologies (Baltov, 2018), and certain new infrastructures are needed. They must be focused on reinforcing networks for installation and redesigning the harbours required for some major marine renewable projects. Wind energy is at a mature investment with the achievements in the Baltic Sea for example. But the majority of investors still are not confident enough when approaching the commercial options of wave or tidal devices in the water (Johnson et al., 2018; Meygen, 2014). Then they may consider a commercial array depending on demonstrating that similar technology have the technical capacity to generate reliably. From the rest of the world the Caribbean had proved some potential though it comes with complication due to hurricanes. Another potential synergy is with oil and gas and their supply in the marine areas. But many basins inside EU still do not prove a market development for the “blue” energy sectors.

The sustainable blue economy is expected to grow at pace over the next decade and offers significant opportunities for investment. Several studies have provided estimates of this growth potential. The World Wildlife Fund (WWF, 2015; cited in Accenture, 2017) has estimated that overall global ocean assets, including ecosystem services, are worth 24 trillion USD and that a significant percentage of these assets will rely on healthy, productive and resilient oceans to maintain their value (European Commission, 2018). The Organization for Economic Cooperation and Development (OECD, 2016) conservatively valued the blue economy’s contribution to the global economy in 2010 at 1.5 trillion USD in gross value added.

The design, building and functioning of smart cities provides the opportunity to come up with effective solutions for optimal utilization and saving of energy, reduction of the consumption of non-renewable resources, control of environmental waste, ensuring sustainable development, optimization of the efficiency of urban systems, that leads to increasing the quality of life of the populations. The sectoral specialization of the blue economy is in accordance with its innovative potential and the priority guidelines for the development of scientific research and innovations for cities and regions in coastal areas.

The horizontal policy strengthens the innovation ecosystem in the cities and the regions, whereas the emphasis is placed on the development of certain thematic areas for smart specialization. At the same time, during the past few years, the terminology on the ‘circular economy’, the ‘restorative economy’ and the ‘blue economy’ have surged into common policy usage, all over the world. The general understanding considers them as economic systems that re-design traditional economic system of production and consumption around the circular and regenerative patterns of resource and energy use observed in mature ecosystems. The adoption of restorative economy needs not just policy measures but practical programmes to be cared by different companies to improve not just production system but also the distribution for achieving the regenerative patterns.

Promoting the blue economy requires access to affordable long-term financing at scale, but governments and coastal local authorities often have some deficiencies

when trying to push and promote the development. Sources of financing can include support for governance reform, ecosystem-based management of marine areas and resources, and other enabling conditions required for a blue economy. Correcting market and policy failures through the application of science-based integrated maritime planning and barrier removal instruments act catalytically to restore and protect coasts and to generate sizeable business activity and job creation activities.

15.7 Conclusion

When considering the blue economy aspects of the regenerative economy, an innovative approach for development of research and innovation strategies for smart specialization is required. It is based on the quintuple helix model which extends beyond the classical triple helix model and builds upon the quadruple helix model. The outlines of the sectoral specialization of the coastal areas and its cities' economy should be in accordance with the innovative potential for blue growth.

However, the environmental risks or losses in natural capital resulting from unsustainable economic activity in the seas and oceans are continuing to erode the resource base on which such growth depends. The stress and depletion of marine resources have been well-documented. Acidification and warming seas are causing widespread damage with 85% of fish stocks either over-exploited or exploited to the limit. Some estimates show the oceans and seas could contain one kilogram of plastic for every three kilograms of fish by 2025. Unlocking the full potential of a sustainable blue economy is good for the oceans and seas for economies globally. Sustainable blue economy investment and development must be aimed, from the outset, at the transition to a net-zero emissions world, using circular economy models.

The smart specialization strategies have to be developed in compliance with the EC and its Joint Research Centres directorate (JRC) guides and recommendations (JRC, 2016). They aim at increasing the degree of smart specialization through the establishment of some blue growth practices in cities and coastal areas to create an environment of high quality of life for its citizens and good governance.

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