



Realising the potential of the Outermost Regions for sustainable blue growth

Final Report

**Written by COGEA srl,
in partnership with AND International, Fundación AZTI and
Poseidon Aquatic Resources Management Ltd**
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Annex 5 – Mayotte	Annex 11 – Indian Ocean
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Executive summary

Needs and objectives of the study

This study aims at contributing to the implementation of the Integrated Maritime Policy in the nine Outermost Regions (ORs) of the European Union (Guadeloupe, French Guiana, Martinique, Réunion, Mayotte, Saint-Martin, Madeira, the Azores and Canary Islands) and their related sea basins (Caribbean-Azononia, south-west Indian Ocean and Macaronesia). Its main purpose is to identify opportunities for sustainable growth in the blue economy (Blue Growth) in each of the basins, by covering four main areas:

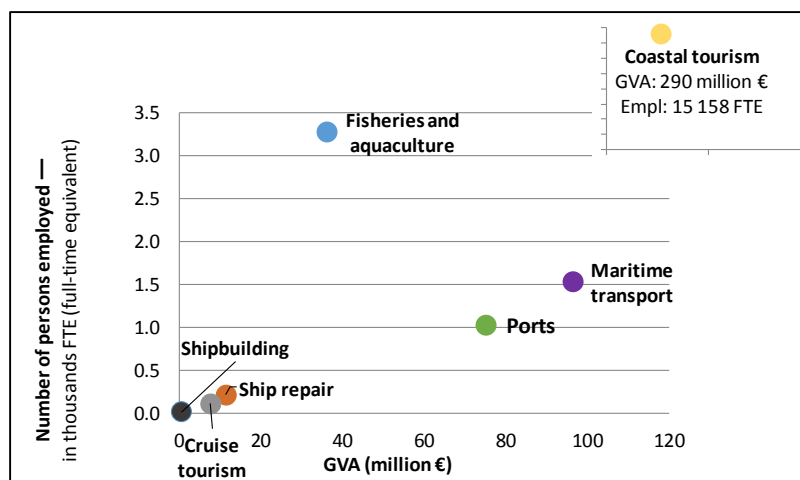
- the **state of play**, which describes the qualitative and quantitative aspects of the blue economy of the ORs and identifies relevant flagship projects;
- the identification of potential **new maritime activities** expected to contribute to Blue Growth in each of the ORs;
- a **gap analysis** of required skills, infrastructure, research and data, and recommendations for appropriate actions (at public and private levels) expected to help fill these gaps; and
- the provision of up-to-date insights and evidence on the new **growth potential** that should help understand the economic and social development process within the maritime sector, including analysis of maritime activity trends, identification of strategies to improve the competitiveness of maritime activities, and the fostering of the role of ORs within the overall EU cooperation framework in the maritime sector.

Main findings and conclusions by sea basin

Caribbean-Azononia (Guadeloupe, Martinique, Saint-Martin, French Guiana)

Maritime-based economic activities contribute significantly to the overall economy of Caribbean countries. Of these, as depicted in Figure 1 below, **coastal tourism, cruise tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** play a major role in the overall Caribbean economy, given that (i) all these activities have been identified in all countries and ORs and (ii) they present the highest level of development in almost all territories. Two activities currently at a pre-development stage present considerable growth potential for the near future, and could create important job opportunities and value added for the sea basin economy: **renewable energy** and **blue biotechnology**.

Figure 1 – Main maritime activities in Guadeloupe, Martinique and French Guiana



Source: our elaboration on 2014 data from INSEE— Institut national des statistiques. For more details, see related Annexes; no data was available for Saint-Martin.

Fisheries and aquaculture

The fisheries sector of the Caribbean-Azononia basin countries assessed in this study is an important component of their blue economy. It represents a significant source of nutrition, employment and foreign exchange, contributing also to social and economic stability. With respect to aquaculture, a developing aquaculture industry is found mainly in Suriname, Trinidad & Tobago and Martinique (15 aquaculture sites in operation in Martinique in 2015), and to a lesser extent in Dominica, St. Lucia and Guadeloupe (5 sites). For other territories, aquaculture remains at an experimental stage.

For these activities, the same gaps were identified in all four ORs, namely: lack of staff with basic education and entrepreneurial capacity; insufficient infrastructure facilities; ageing fleets; limited physical space for aquaculture projects; insufficient scientific knowledge about marine resources to carry out stock assessments; difficulty to access credit (also linked to the lack of collateral for bank loans) and absence of interest of investors or banks to the fisheries sector; lack of governance, as countries in the region have not formally adopted joint fisheries management plans.

Several actions are therefore recommended. First, public-private consultations for exploring the feasibility of the fleets' renewal should be launched, involving both private and public stakeholders. Since fleet renewal is not covered by the EU's Common Fisheries Policy (CFP), alternative funding sources should be investigated. Fleet renewal should be linked to an improvement of guarantee systems and fiscal mechanisms allowing access to credit.

Moreover, regional cooperation for the management of fishery resources should be reinforced, improving the scientific knowledge, and promoting cooperation between research institutes and administrations in the basin. Educational programmes for the sector should also be established, based on the specific training needs of each OR. Training fishermen on how to diversify their activity — e.g. through 'pesca-tourism' — could support the increase of the profitability of the activity as a whole. As regards aquaculture, guarantee systems and fiscal mechanisms should be developed and made available to project initiators to allow them invest in the sector. Furthermore, analysis of infrastructure needs and related equipment should be carried out, elaborating a strategic plan for fishing port infrastructure. Finally, as regards the knowledge about marine resources, research capacities should be reinforced, developing a regular monitoring of stocks and catches and establishing robust technical support and knowledge transfer to fishermen.

Coastal tourism

The wider tourism sector, including non-maritime activities, is a key part of the economy of most countries of this sea basin and around one quarter of the population in the Caribbean-Azononia is directly or indirectly employed in the sector.

The main gap identified for this activity concerns human resources and knowledge, namely a lack of relevant skills and related research. Therefore, entrepreneurial capabilities should be enhanced by setting up links between the industry and education systems. However, investments are also needed for improving services in the marinas and to enable hotels to achieve international standards.

An example of best practices:

the Caribbean Large Marine Ecosystem Project

The objective of this project is to help participating countries to improve the sustainable management of their shared living resources through an ecosystem-based management approach. Results achieved were the development of a strategic action programme for sustainable management and the adoption of a shared vision of the countries involved regarding the priority interventions, reforms and investments. Data relating to fisheries, biology, pollution and socio-economics were gathered and formed the scientific basis for the elaboration of the programme of actions. Furthermore, a regular monitoring of the state of play of the project goals has been developed.

The project is replicable in other contexts where marine resources need to be monitored and assessed.

The Caribbean Sustainable Tourism Policy Framework is an opportunity for further developing tourism and cooperation within the region: it could be used by central administration, supported by tourism organisations and natural parks' management authorities, to promote ecotourism models that have the potential to limit the impact of mass tourism on the environment and to harmonise tourism-related taxation.

As with many areas, tourism in the ORs depends on good levels of transport infrastructure and air connections. Services in marinas and on land are generally insufficient, while hotels often do not meet international standards. Furthermore, financial resources dedicated to the promotion of EU's ORs as a tourism destination have declined. In general, it is suggested to support the accommodation sector through private investment, by creating adequate investment conditions (i.e. simplified administrative procedures and good infrastructure) considering that all ORs in the area possess adequate assets (e.g. attractiveness of coastal areas) for attracting these investments.

Synergies between cruise and coastal tourism should also be improved all over the region. Specifically in Saint-Martin, a growth driver could be the adoption of the regional scheme for the development and planning of tourism activities developed by the local authority (*Collectivité de Saint-Martin*), adopted for 2013-2020.

Cruise tourism

With approximately 24 million cruise passengers in 2014, cruise tourism is the second largest tourism-related activity in the sea basin (by arrivals). In fact, in that year the Caribbean area in general was the most visited cruise destination in the world. It has nevertheless to be noted that cruise tourism itself contributes relatively little to the local economies. Indirect positive effects of the activity on businesses along the supply chain are generally bigger than positive direct effects of the activity itself, increasing therefore the impact of cruise tourism on local economies.

The main growth driver is represented by the synergies that could be created with coastal tourism and port services. In fact, all ORs of the sea basin lack an organised on-land offer for cruise tourists and some ORs do not have adequate infrastructures to welcome large cruise vessels. Furthermore, access to the city centres and to other touristic areas is inadequate and requires investments for developing appropriate transport connections.

Overall, the development of a regional cruise strategy shared by both private and public stakeholders could address local needs for: (i) improving the operating conditions of cruise lines, (ii) advocating stricter environmental standards for cruise operations, (iii) diversifying products (premium vacations, special cruise options, etc.) taking into account the capacities of ports in terms of infrastructure, and (iv) increasing synergies between the cruise industry and coastal tourism in each territory. Furthermore, investments should be directed to the improvement of the attractiveness of the waterfront in the different territories.

The development of cruise industry would benefit businesses linked to other activities in each territory (in particular port services). Larger synergies between cruise and coastal tourism would also increase the impact of cruise tourism on the territories.

Shipping

The insular nature of most territories in the sea basin is reflected in the importance of ports and maritime services for trade, especially for the import of manufactured articles to satisfy the demand from locals and tourists alike.

The main gap identified consists in the existence of out-of-date labour practices, resulting in inefficient and dangerous working conditions in ports all over the sea basin. Moreover, some ports (St. Vincent, Grenada and Antigua) have inefficient terminal designs, limited space for container traffic and outdated cargo pier structures – which restrict operational efficiency and cargo capacity substantially. The lack of

skilled staff is a serious gap and impacts maritime security, cargo handling, ship planning and logistics management.

The main barrier to growth is financial: the only source of funding is public and not always sufficient for the required investment. Nonetheless, thanks to public funds from the European Regional Development Fund (ERDF), the Conseil Régional and the French State, important port infrastructure investments were made in the analysed ORs (except for Saint-Martin). In addition to public commitment, another driver that could boost shipping in the area is the strategic plan of the Caribbean Community (CARICOM) for maritime transport service, as it may reduce transport costs through the simplification of administrative procedures and efficiency improvements at sea basin level.

Setting up a network among the territories for collaborating and sharing experiences and know-how could also support the development of the activity, especially if it focuses on the reduction of competition and the development of complementarities among the ports. Moreover, ports' efficiency should be enhanced by stimulating joint investments by all private and public port operators that move away from classic logistic models and implement technology and IT applications for tackling challenges such as the increasing size of ships and demands for enhanced security and safety.

Marine renewable energy

Marine renewable energy in the basin is at a pre-development stage. However, assessments conducted in the context of the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) indicate a significant potential for wind energy for some CARICOM member States. Further on-site feasibility studies on offshore wind potential as regards the community impact, the economic cost and the environmental footprint are foreseen in the next years under the umbrella of the C-SERMS. Future actions within the CARICOM States will largely depend on the results of these studies.

In terms of ongoing work on marine renewable energy in the basin, the lack of cooperation between the different territories results in a substantial duplication of research effort. For this reason, the path initiated by CARICOM Member States to develop a cooperation framework for data sharing and the exchanging of best practices and investment sources should be strengthened and pursued further.

Blue biotechnology

The marine biodiversity in the Caribbean Sea — one of the highest in the world — represents an abundant but underutilised resource. While in the past a (limited) number of drugs has been developed from organisms found on coral reefs in the basin, namely antiviral drugs and an anticancer agent, there have been no recent developments. The most relevant barrier to growth is at present limited research capabilities, and the fact that more specialised training is not available locally.

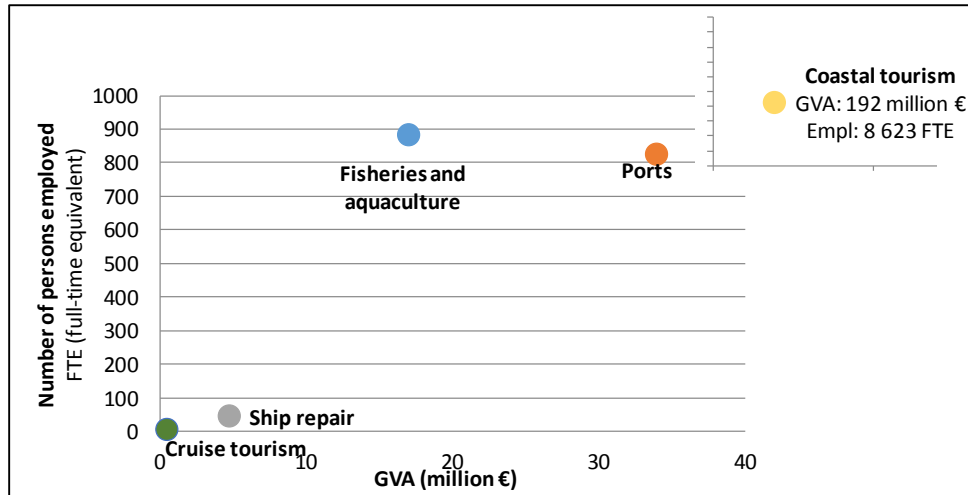
Blue biotechnology in the basin is largely dormant. We observed that only few stakeholders are currently involved in related research and development (R&D) in the basin, namely universities, research institutes and private companies in Martinique and Guadeloupe. The establishment of regional facilities, such as biological resource centres, should be considered for the Caribbean-Amaozonia basin. Furthermore, developing strategic partnerships and international collaboration with local and EU academia and pharmaceutical companies could offer opportunities to achieve strategic, scientific and economic gains from the largely unexplored resources of the Caribbean region. To foster research into developing bio-resources in the ORs, calls for projects to support related R&D could be launched by local and central administrations.

South West Indian Ocean (Réunion, Mayotte)

In the south-west Indian Ocean, **coastal tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** play an important role in the overall local economy. These activities have been identified in all countries and ORs and have

reached a high level of development in almost all territories. While these three activities showed important potential in terms of jobs opportunities and value added, three activities have been also identified at a pre-development stage, showing growth potential in the near future: **cruise tourism, renewable energy and blue biotechnology.**

Figure 2 – Main maritime activities in Réunion



Source: our elaboration on 2012 data from INSEE. See chapter 1 of Annex 6 for more details.

Fisheries and aquaculture

Regarding marine aquaculture in the basin, red drum fish is currently produced in Mauritius. It is no longer produced in Réunion (a hatchery is still operating there with public support) and Mayotte. In the latter, local authorities are trying to investigate the possibility to relaunch the production by supporting the recruitment of a local manager, but the financial feasibility of the operation remains a challenge as does the general lack of skilled local technicians.

Regarding fisheries, an important migratory route of tuna passes through the sea basin, with the Somali basin to the north and the Mozambique Channel to the west being key fishing grounds. In Réunion and Mayotte, fishing consists of both industrial and artisanal activities, targeting pelagic and reef fish; a toothfish fishing fleet is also active from Réunion, using it as a base to land fish caught in French Southern Lands. Scientific knowledge about the status of stocks in the sea basin, especially non-tuna stocks, needs to be improved. In addition, many fishermen lack business skills, and both the workforce and the fishing fleet are ageing.

Another gap, identified specifically for Mayotte, refers to the competition between vessels that comply with EU standards for working conditions and safety on board and boats that have a provisional derogation from the obligation to comply with these standards. The latter fleet should (continue to) be modernised by vessel owners and aligned with EU safety rules. Local fishing operators also demand that fishing resources in Mayotte waters be exclusively caught by EU fishing vessels in conformance to the CFP.

For Réunion, the risk that the industrial fishing sector disappears in the medium term due to higher operating costs compared to neighbouring countries poses a serious problem. Together with local authorities, local operators investigate ways to remain competitive in addition to the current EU sectoral support through the European Structural Funds Operational Programmes for outermost regions. For instance, operators involved in longline tuna fishing wish to investigate additional financial and fiscal public mechanisms to renew the ageing fleet, aware of the substantial investment required and the overall CFP rules forbidding public subsidies for fleet renewal.

At sea basin level, fisheries management and the sustainability of the fisheries could be improved by a better monitoring of local fish stocks (covering both tuna and non-tuna species and straddling stocks), the status of many of which is still unknown. The measure should be progressed by the Indian Ocean Tuna Commission (IOTC) for tuna species and by the Southern Indian Ocean Fisheries Agreement (SIOFA) for non-tuna species.

Coastal tourism

Tourism is a key economic activity in both the Seychelles and Mauritius, and to a lesser extent in Madagascar and Réunion, whilst it is only marginal in the Comoros and Mayotte. In Réunion, the tourism offer is broad due to the varied landscapes that make the island suitable for land-based activities, such as hiking, but also for coastal and maritime activities. As concerns Mayotte, the sector is marginal but currently undergoing actions to develop cruise tourism and ecotourism (the entire economic exclusive zone is a marine protected area).

Coastal tourism, however, is hindered in both ORs by the lack of quality accommodation that meets the expectations of international tourists. In particular, Mayotte lacks accommodation in areas other than the main towns. The lack of an adequately skilled workforce with basic knowledge of foreign languages and the high costs for reaching these destinations are barriers to the growth of this sector in both ORs. Additionally, over the last few years Réunion has had to deal with repeated shark attacks on surfers and swimmers that discourage tourists from visiting the island.

Nonetheless, significant drivers for blue growth are represented by the exceptional biodiversity in the basin, which in the case of Mayotte is protected through a marine protected area. Therefore, the development of forms of ecotourism, activated by local administrations (e.g. the Comité Départemental du Tourisme de Mayotte) and private stakeholders, could represent useful models to safeguard this natural resource by pointing to high end tourism and limiting the impact of mass tourism on the local environment. Furthermore, in addition to English and French, staff in the sector should be trained to acquire basic skills in Chinese and Russian, as these are the mother tongues of most of the foreign tourists visiting the sea basin.

Finally, one specific action is suggested for Réunion to be coordinated by public authorities and involving private actors: namely the creation of a 'whale sanctuary' for enabling whale watching as the waters of this OR are a transit zone of whales' migratory routes and also a breeding and calving area.

Cruise tourism

At sea basin level, international cruise tourism is currently taking place, offering round trips of the islands and connecting the Seychelles, Mauritius, Réunion, Mayotte and Madagascar. Given this interconnectedness, we recommend adopting an integrated approach for developing the sector in the whole region. It is also important to improve the related tourism supply chain in Réunion and Mayotte, ranging from the skills of

An example of best practices:

the regional conference on blue growth

In December 2016, the Indian Ocean Commission (IOC) in partnership with Réunion (France) organised a regional conference on blue growth for the purpose of developing regional cooperation in the area within maritime sectors. Several recommendations resulted from the conference among which:

- Strengthen cooperation between the IOC and the United Nations Economic Commission for Africa;
- Support the 'whale road' project and other actions aimed at developing 'ecotourism';
- Support the exchange of data, expertise and lessons learned in renewable energy and ecosystem management issues;
- Strengthen port activities for supporting other maritime activities, including responding to the growing demand of cruise tourism in the sea basin; and
- Continue improvements and increases of regional connectivity at air and sea levels.

The activity is considered a milestone since it triggered a cascade of EU and French initiatives within the blue economy in the area.

staff working in tourism to more and better offers of activities on land for cruise passengers. In this context, to better integrate cruise tourism with coastal tourism, the variety of landscapes and the abundance of the local biodiversity could be harnessed to offer competitive packages to cruise tourists during their stopovers. In addition, the maintenance and upgrading of port and quay infrastructures should not be neglected, as these are not adequately managed in most of the sea basin. These measures should be activated by the IOC, and supported by national tourism associations and port authorities through a regional organisation representing them (for instance through the Cruise Indian Ocean Association and the Indian Ocean Port Association).

Shipping

The South West Indian Ocean region has an advantageous position along the main maritime freight routes from Asia to Africa. Marine transport is also a key sector within the basin itself, where connectivity is required between islands in their own waters, with other island nations and with countries on the continents beyond. In this context, the main gap we identified is in the weak short sea shipping in the basin that hinders easy exchanges between countries in the region.

A gap in Mayotte regards the limited generational turnover within the sector: because Mayotte became an OR only fairly recently, it is now subject to visa requirements that make it difficult for local stakeholders to hire experts from abroad to train staff. Another barrier in Mayotte is the lack of certification — in line with the International Ship and Port Facility Security Code — of the Longoni port as a recognised safe port, which hinders the development of international shipping. A gap identified in Réunion is the poor availability of local specialists to understand and assess the environmental impacts of tropical ports. This situation is worsened by the fact that national regulations are not adapted to the tropical environment: Réunion has for instance naturally high concentrations of nickel in its soil, which are higher than in metropolitan France, but which have been judged as 'acceptable' by the authorities in charge of the health risks assessment. These gaps slow down the approval of port expansions or upgrade during environmental impact assessments stages.

Marine renewable energy

With all territories in the sea basin largely dependent on imported fuel for power generation, there has been considerable interest in solar photovoltaic energy and wind power development, including marine wind farms. Seawater air conditioning is being developed in Réunion and showing potential in Mayotte. However, two main gaps were identified for the diversification of such activities: a lack of skilled local staff and technology that is inadequate for cyclonic conditions. To develop more suitable technologies, it is necessary to collect more data at sea, identifying sites for developing pilot projects and ensuring the development of productive capacity. Related R&D efforts are already supported by the Indian Ocean Commission (IOC), and with the renowned Laboratory for the Study of the Atmosphere and Cyclones (LACY) already present in Réunion, the island is in a good position to develop as a hub for experimental research in difficult environments. In anticipation of rapid development of marine renewable energy technologies internationally, and despite several failures of pilot projects, public authorities should try to attract private investors (for R&D projects at first). This task should be carried out ideally in collaboration with the marine renewable energy cluster in Réunion (Temergie).

Blue biotechnology

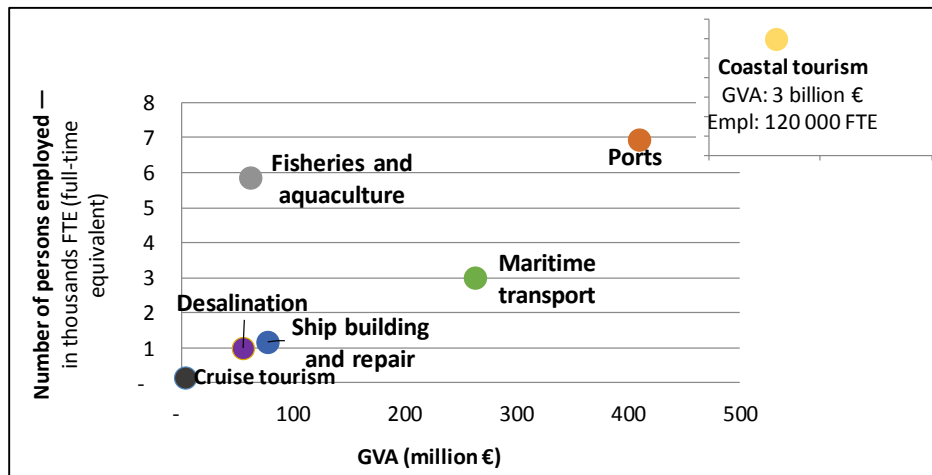
Within the sea basin this sector is most advanced in Réunion, where the research platform for biotechnology and innovation of the Cyclotron Réunion Indian Ocean (CYROI) operates. However, the sector is still only at a developmental stage, and the gap analysis revealed a lack of a robust tool to transfer and share knowledge, innovative ideas and information between the different activities' supply chain stages (raw material production, R&D, industrial production). While related organisations

already exist, their integration into a maritime research hub should be investigated, based on earlier proposals by Réunion’s Regional Council. Furthermore, collaboration with the private sector should be improved, considering its possible access to funds from both the EU and the IOC, and its capacity to attract private investments. In this regard, the fact that the sea basin is not currently covered directly by public funding possibilities for blue biotechnology is a serious barrier. Therefore, local authorities and the IOC should seek support beyond the ERDF, for instance from development banks such as the World Bank.

Macaronesia (Canary Islands, Madeira and the Azores)

In the Macaronesian sea basin, maritime-based activities constitute the backbone of the local economies. Of these, **coastal tourism, cruise tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** have been identified as playing a pivotal role and are highly developed. Two activities are at a pre-development stage and show a remarkable growth potential for the near future: both **renewable energy** and **blue biotechnology** could create important job opportunities and value added for the sea basin economy.

Figure 3 – Main maritime activities in Canary Islands, Madeira and Azores



Source: our elaboration on 2014 data from Instituto Nacional de Estadística (INE), Instituto Canario de Estadística (ISTAC) and Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente (MAPAMA) for the Canary Islands and from Instituto Nacional de Estadística (INE) for Azores and Madeira. For Shipbuilding and repair data refer to 2013. For more details, see chapter 1 of Annex 12.

Fisheries and aquaculture

Commercial fishing has a long tradition in Macaronesia, where it is characterised by the predominance of small-scale activities. However, as in the other basins, in Macaronesia, the sector faces barriers in terms of slow generational turnover and of fishermen that lack necessary skills. Moreover, in all ORs in the basin the sector suffers from poor access to funding and lack of investment. Finally, the lack of effective monitoring and control in the sea basin makes it hard to deter illegal, unreported and unregulated fishing (IUU).

For the three ORs, the following specific gaps emerged: in the Canary Islands the sector has to cope with high transportation costs due to the remoteness of the islands and it is financially highly dependent on the European Maritime and Fisheries Fund (EMFF); in Madeira the limited scientific knowledge of the fish stocks and the size and age of the vessels pose challenges for the sector; and in the Azores challenges are the lack of facilities to process fish (other than tuna), as well as outdated auction markets and landing places, and the inadequacy of existing traceability and control mechanisms, especially for monitoring recreational fishing. With regards to the latter, the high number of recreational licenses, e.g. in Canarias, make control activities

challenging. Some of the catches may reach the consumer outside the formal commercialisation channels e.g. sold directly to restaurants and hotels. Other modalities through which illegal catches enter into the market are professional fishing with forbidden nets or in forbidden areas. Undeclared catches negatively affect stock assessment, while illegal activities constitute unfair competition for formal operators.

Throughout the basin, it is essential to strengthen coordination with Regional Fisheries Management Organisations (RFMOs), namely the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the Fishery Committee for the Eastern Central Atlantic (CECAF), to improve monitoring, control and surveillance in order to reduce IUU fishing. It is also important to develop Maritime Spatial Planning (MSP) in the basin as several maritime activities are being carried out at the same time in a limited space. Furthermore, the issue of fleet renewal should be tackled, as well as the lack of management skills that keeps fishermen from diversifying their business. In the Canary Islands, the sustainability of exploiting deep-water species could be explored, and in Madeira synergies with tourism (e.g. pesca-tourism) could be exploited.

With regard to aquaculture, the waters of the archipelagos offer good conditions for the development of this activity as they have the right temperatures throughout the year. However, gaps that we identified relate to the pending approval of the Management Plan for Aquaculture in the Canary Islands (PROAC) and to administrative hurdles for establishing operations, which is a key problem also in Madeira. An additional difficulty is in treating fish diseases due to the cost of importing veterinary drugs.

We also identified significant growth drivers: stakeholders in the Azores could leverage the 'Azores brand' to market locally caught or produced seafood, and the 'accelerated licensing procedure' for aquaculture operations in the Azores offers good investment conditions. Furthermore, in the Canary Islands there are several species with great potential for future use in aquaculture. Our recommendations for the aquaculture sector are therefore to optimise regulations for facilitating investments and obtaining licences, and to improve access to veterinary drugs, e.g. through contracts with feed providers.

Coastal tourism

Tourism, which goes beyond coastal tourism as it includes many non-maritime activities, has proved its potential all around the sea basin, where it is a well-established activity.

In the Canary Islands and in Madeira in particular, it accounts for a high share of the local economy and employment. Taking advantage of the marine environment and resources and of the islands' coastal culture, coastal tourism in particular could be further expanded by offering more nautical activities (e.g. yachting), as well as whale and bird watching, pesca-tourism or marine gastronomy.

Remaining gaps that we identified concern both human resources and tourism infrastructure. For instance, qualified staff is limited due to a lack of cooperation between industry and the educational system; the accommodation sector is heavily indebted; and mooring places are missing in the marinas, especially for larger yachts. Moreover, satisfying the demands for energy, drinking water and waste disposal resulting from increases in tourism in a sustainable way poses further challenges to local authorities and port management bodies.

An example of best practices:

Marca Azores

The Marca Azores is a brand aimed at promoting and valorising Azorean products in domestic and foreign markets. Furthermore, by investing in the different sectors, it aims at increasing the visibility, popularity and consumption of the products and services at the international level, thus promoting the expansion of the export-based economy.

The Azores brand has given its label to around 1 500 food products, services, establishments and crafts, leading to an increase in sales of goods and services.

The practice proved to be innovative and achieved good results so that it will continue in the future. The practice of branding a product or service with a local label is transferable and reproducible in other contexts.

To address these gaps, vocational training schools such as the 'Sea School' of the Azores could host life-long learning courses that are specifically tailored to blue economy activities. It is also fundamental that local authorities ensure a balance between developing new tourism activities and creating related facilities on the one hand, and the protection of the environment and its resources on the other, e.g. by developing ecotourism. Due to its broad geographic coverage, the Macaronesia Maritime Cluster is well placed for leading such an initiative.

Otherwise, the geography and environment of the islands in the basin themselves present important drivers to the growth of the sector. For instance, the location of Azores makes them an ideal stopover for yachts on cross-Atlantic trips, and in the Canary Islands the marine environment is an element that could still attract more visitors in addition to the new cultural attractions that are developing in the region.

Cruise tourism

Cruise tourism also has a role to play in all the three ORs in the sea basin, especially to the extent that it can contribute to offsetting the seasonal cycles of coastal tourism. Whilst cruise tourists only do short stays on land, unlike coastal tourists who stay for days or even weeks, their numbers are nevertheless significant (for instance in the Canary Islands in 2015 there were 2.2 million, about 16 % of all tourists). However, one challenge, among others, is the improvement of 'urban' services, such as accessibility of the cities from the ports, public transport, accessibility of public zones by the elderly, security and cleanliness of public areas, cultural offers and formal short tourism services (i.e. organised tours) that can be offered to same-day visitors. In particular in the Azores, which are a stopover destination for the biannual repositioning of cruise ships between the Mediterranean and the Caribbean, this activity is too concentrated on the main islands and therefore one solution could be to develop short 'micro cruises' with small- to medium-sized motor or sailing boats that last one or two days. Similarly, cruise operators should be encouraged to seek synergies with local tour operators, for instance by extending the length of stopovers so their passengers can participate in complementary attractions and activities. Private initiatives, such as the Association Cruises in the Atlantic Islands that bring together relevant stakeholders, could be important drivers for such projects.

Shipping

The strategic position of Macaronesia in the Atlantic Ocean offers advantages for the development of maritime freight transport, while the fragmentation of the territory makes ferries the most important means of passenger transport (in terms of numbers).

In terms of gaps for the development of the activity, in Madeira and the Azores we identified a lack of staff with the required skills in logistics and management, as well as a low frequency of ferry connections between the islands. Here, the Macaronesian Maritime Cluster could act as a driver for improving training in the area through supporting mutual learning, while ferry companies could take advantage of EU funds (e.g. ERDF) to enlarge their fleet to accommodate more passengers. In the Canary Islands, the situation is almost reversed, as this OR boasts highly trained staff, although generational turnover is needed. In addition, we also identified a lack of financial instruments, as the sector relies heavily on the ERDF.

We also identified important growth drivers in the basin. For instance, the Azores have an infrastructure for the distribution of liquefied natural gas (LNG), a more environmentally-friendly alternative to the fuel oil used by ships. Our recommendation is to expand the local capacities for moving and storing goods, and to upgrade the facilities for bunkering LNG, as LNG-propelled vessels need more frequent refuelling. The Azores could then become the 'transport hub' of the Atlantic. However, private investors are not interested in this area due to restrictive legislation for ports management concessions. Therefore, new port management models should be assessed to attract private investments to upgrade port infrastructures.

In Madeira, key drivers are (i) the investments programme for reorganising harbour infrastructures to avoid conflicts among different maritime activities, and (ii) the enhancement of efficiency and modernisation of ports, intended to be achieved by granting concessions to private investors for the management of ports. However, the developers should ensure that future climatic conditions as well as sea and wave dynamics are taken into account when building these infrastructures. In the Canary Islands, key drivers are the investments made in the ports, such as the construction of a new dock and storage facilities for grain and other food products in the port of Las Palmas, which will provide services to South American exporters. Investments are also made for cruise activities e.g. quay enlargement of Puerto del Rosario.

Marine renewable energy

As in the other sea basins where the territories depend on imported fuel, also in Macaronesia there is a strategic interest in renewable energy. However, the sector is still at a pre-development stage, with only one pilot project of a wave energy plant in the Azores. In the Canary Islands, the regional government is funding the Oceanic Platform of the Canary Islands (PLOCAN), which has the potential to become a world reference as a platform for the development and testing of marine technologies.

In addition to unfavourable climatic conditions in the basin, the main barrier to growth of this sector is represented by the limited potential in the short term for becoming an effective source of energy, which does not attract private investors. To develop blue energies further, we recommend that regional authorities address the R&D challenges and funding issues, and that — in cooperation with private stakeholders and research institutes — they improve related training opportunities.

Blue biotechnology

The activity is not carried out at sea basin level, and has been identified only at OR level. Production of microalgae takes place in the Canary Islands and to a lesser extent in Madeira. This activity, a branch of the aquaculture sector, is considered the basis for future blue biotechnological activity. Also, one company in Madeira is investing in the production of natural extracts from marine macroalgae. More generally, investors are discouraged by high transport costs and by the fact that there are already established players in China and the United States (Hawaii) against which it is difficult and costly to compete. On the other hand, especially in the Canary Islands, the availability of industrial engineers and aquaculture technologists, as well as of desalination facilities, which provide the brine required for the production process, could represent growth drivers.

For this sector, we recommend developing a productive infrastructure for adding value to the existing algae production. Funding, which is currently driven by the Economic Development Company of the Canary Islands (SODECAN), should be diversified.

Overall conclusions of the study

The public sector is the 'cornerstone' of blue economy development, not only in terms of financial support, but for developing a holistic vision and for organising the maritime economy in each OR. Of course, decision-making processes cannot be efficient without good knowledge of the sector, which is not a given for these territories. In fact, data gaps are significant even for the tourism sector and for fisheries (stock assessments), as well as for general socio-economic indicators. Therefore, the first step that should be taken is to **set up robust and regular data collection and management systems**, for instance by setting up dedicated 'observatories' for identifying and quantifying the maritime dimension of all ORs and for better defining strategies aimed at developing their blue potential. Moreover, for economic data, the **availability of structural business statistics** at (at least) NACE 4 level **should be ensured** by national statistical institutes and EUROSTAT, to allow an effective monitoring of the blue economy of the ORs.

Other universal gaps are the limited availability of adequately qualified and trained staff and the absence of links between the education systems in the ORs and businesses involved in the blue economy. This not only hinders the creation of training that is 'tailored' to industry needs, but it also reduces the attractiveness of the maritime sector for younger generations, thus limiting generational turnover. Therefore, **a more pro-active role of industry in the education systems should be encouraged** in all ORs. Structural funds are available to support the improvement of professional skills, including for the blue economies of the ORs.

Two needs have been identified in the fisheries sector of all ORs: the identification of new sources of funding for supporting the renewal of the fleets, and the improvement of the activity's attractiveness for younger people to help generational turnover. Considering that EU policies do not cover fleet renewal, local public authorities should launch consultations between the sector and national authorities to identify possible actions and alternative funds. Regarding the generational turnover, promotional campaigns should be launched by local public authorities to inform youngsters about the opportunities that the sector can offer, while the training of fishermen as 'entrepreneurs' could enable them to diversify into other sectors.

Coastal tourism plays a pivotal role in the blue economy of all ORs, having the largest socio-economic impact and still showing some growth. Its potential could be improved further by local public authorities by developing a holistic vision for the development of the sector and strengthening synergies along the tourism supply chain, with other maritime activities (e.g. pesca-tourism), and with other territories in the same sea basins. Increased flows of tourists will generate not only higher demand for goods, but also for energy. It is essential not only to upgrade shipping and port facilities or to market local seafood to tourists, but also to invest in renewable energy. Realising the potential of coastal tourism depends on the extent to which necessary investments are undertaken by private companies in all ORs.

While coastal tourism could be seen as the 'lead engine' for the development of the blue economy in the ORs, our analysis shows that, while there are certain commonalities, each sea basin and **each OR has its own specificities** that need to be addressed by specific public and private interventions. Detailed conclusions and recommendations that we identified in each sea basin for the development of each analysed blue economy activity are reported in chapter 2 'Final remarks on all Outermost Regions' and Table 9 of the Report.

Finally, it is worth mentioning the key **role of the ORs in the EU's international cooperation framework**. Within the context of the Transatlantic Ocean Research Alliance, the European Commission's agenda for international ocean governance and the European Neighbourhood Policy, the ORs can play a key role since they are representatives of the EU in the world where they can act as its outposts for streamlining new fields of international cooperation. The ORs allow the EU to actively participate in international cooperation frameworks far from its continental borders and can therefore play the role of 'promoters' of EU blue growth policies in external contexts. They can also disseminate best practices in their respective sea basins and share experiences with neighbouring countries. As an example, the Canary Islands' PLOCAN participates in the EU-funded project Atlantic Ocean Research and Collaborative Supporting Action, which is carried out within the framework of the Atlantic Ocean Research Alliance. The aim of this initiative is to support the Commission in negotiations with the USA and Canada on Transatlantic Ocean Research Cooperation. The secretariat of the Atlantic Ocean Research Alliance is able to provide research knowledge and experience through its partners in blue growth activities, such as aquaculture, biotechnology and renewable energies, and to support actions, such as the sharing of access to infrastructure. Thus, it can directly contribute to blue growth in the Canary Islands by channelling the expertise of the partners. It has also positive effects for the other regions due to the strong collaboration networks in the sea basin.

Report

0 Task reminder

Within the Framework contract 'Support to the implementation of the Integrated Maritime Policy of the EU' — MARE/2012/07 Ref. ARES(2016)1756824 — the study 'Realising the potential of the Outermost Regions for sustainable blue growth' has been carried out. This Final report constitutes the final delivery of the study, for the purpose of reporting the results of all Tasks.

This study has been carried out by COGEA srl, in partnership with AND International, Poseidon Ltd and AZTI Tecnalia.

0.1 Objectives and methods

It is worth recalling here the four specific objectives that have been identified for this study, namely:

- qualitative and quantitative **state of play** of the blue economy of Outermost Regions (ORs), or Régions Ultrapériphériques (RUP), identifying flagship projects;
- identification of **potential new maritime activities** that might contribute to fulfilling the Blue Growth potential of ORs;
- **gap analysis** for defining policy interventions;
- understanding of economic and social development processes within the maritime perspective and analysis of the trends of maritime activities, identifying **new growth potential** based on unexploited maritime activities, fostering the role of ORs within the overall EU cooperation framework in the maritime sector.

In light of the above objectives, for each OR and each sea basin, **maritime activities have been mapped** according to the methodology summarised below, and **quantified** in terms of (i) Gross Value Added (GVA), (ii) employment and (iii) turnover, indicating the CAGR ⁽¹⁾ for each of them. With regard to the use of these indicators and the overall methodology used in this study, it is noted that:

- The overall methodology used for defining maritime activities and for calculating these indicators is based on the European Commission study on the '**Establishment of a framework for processing and analysing maritime economic data in Europe**' ⁽²⁾, which defines key methods for identifying and measuring the blue economy in the EU.
- The **methodology** has been **adapted to the specific traits of the OR blue economy**, ensuring in any case its **reproducibility**. This means that the methodology used in this study can be re-used for assessing the OR blue economy whenever needed ⁽³⁾.
- Variables used (i.e. GVA, employment and turnover) have been selected because they are indicative of **specific socio-economic aspects**, i.e. GVA monitors the economic impact of an activity, employment indicates the social impact and turnover indicates the state of health of businesses.

This Final Report provides **results** for all tasks of the study, starting from a sea basin perspective and then moving on to the ORs included in that sea basin.

0.2 Geographic scope of the study

This study has been developed for nine ORs and three sea basins. The ORs are: Guadeloupe, Martinique, Saint-Martin, French Guiana, La Réunion, Mayotte, Canary Islands, Madeira, Azores. The sea basins are and their composition are reported in the table below:

⁽¹⁾ Compound Annual Growth Rate is an indicator used for understanding the trend of a historical series of data.

⁽²⁾ <https://webgate.ec.europa.eu/maritimeforum/en/node/4009>.

⁽³⁾ See § 0.3 for possible exceptions.

Table 1 – Sea basins composition analysed in this study

Sea basin	EU ORs	Overseas Countries and Territories	Independent countries
Caribbean-Amazonia	French Guiana (FR) Guadeloupe (FR) Martinique (FR) Saint-Martin (FR)	Anguilla (British) Montserrat (British) Saint Barthélemy (FR) St-Maarten (NL)	Amapa State (Brazil) Antigua and Barbuda Barbados Dominique Grenada Saint Lucia Saint Vincent and the Grenadines Suriname Trinidad and Tobago
Macaronesia	Azores (PT) Canary Islands (ES) Madeira (PT)		Cape Verde
Indian Ocean	Réunion (FR) Mayotte (FR)	TAAF — French Southern and Antarctic Lands (French)	Comoros Seychelles Madagascar Mauritius

0.3 Limits encountered and solutions adopted

The main limit encountered in this study concerned the availability of socioeconomic raw data (i.e. gross value added, employment and turnover), studies and analyses on maritime activities. While for some ORs the blue economy has been mapped and information is available (e.g. Macaronesia ORs) for many others information is very limited or not updated (see the next paragraph for more details). For this reason, a two-step mitigation solution has been adopted:

- 1) In-depth analysis of data availability in national and local statistical institutes' websites;
- 2) If option 1) did not provide useful information, considering the limited size of OR economies, especially their maritime economies, quantitative data have been surveyed through interviews with relevant actors (e.g. Chambers of Commerce, or local administrations) or estimated by our experts, as reported in detail in chapter 1 of each Annex.

As regards data availability, another systemic problem encountered is the confidentiality of data. The limited size of some maritime activities has not made it possible to disclose economic or employment data, because related activities are carried out by few companies, and in some cases, only by a single company. In these instances, qualitative information has been provided by our experts, surveying relevant information, when available, directly in the field.

0.4 Focus on macroeconomic data availability: state of art and needs

For the purpose of compiling this analysis, data on GVA, employment and turnover at NACE ⁽⁴⁾ code level (4 digits) have been used, also in line with the methodology outlined in the European Commission study on the '*Establishment of a framework for processing and analysing maritime economic data in Europe*'.

For some ORs, namely Mayotte and Saint-Martin, it was not possible to quantify the size of the blue economy, but only to identify and qualify the existence of maritime activities. Whereas for Azores, Madeira and Canary Islands, these data were available for almost all NACE codes, for the French ORs data for almost every NACE code at 4-digit level were available only for employment. In these cases, estimates on GVA and turnover were performed, based on employment data and information collected during field work through interviews with relevant stakeholders.

⁽⁴⁾ The acronym NACE stands for *Nomenclature statistique des activités économiques dans la Communauté européenne*, i.e. Statistical classification of economic activities in the European Community. It is the nomenclature used for classifying economic activities. For more details please see http://ec.europa.eu/eurostat/statistics-explained/index.php/NACE_background.

For the purpose of compiling the analysis at sea basin level, it was even more difficult to survey data for non-EU territories, especially considering the fact that data collected by these countries do not make use of the same collation rules or statistical standards. Often maritime activities in these territories are classified and defined in a different manner. For instance, 'maritime transport' and 'ports' are reported under the activity 'shipping', which has also been used in this report, for a better reading and understanding of the findings.

However, in all those cases where data were not available for non-EU countries, we identified the existence and the development level of each maritime activity for each territory included in the sea basin, qualifying — rather than quantifying — the size of the blue economy in that specific context. Only for Cape Verde was it possible to quantify the maritime economy by making use of data from the Banco de Cabo Verde.

With the exception of Macaronesia, where only limited gaps in structural business statistics were identified for some activities, mainly due to confidential issues, the lack of data therefore affected mainly French ORs, in which economic data on maritime activities on a regular basis (e.g. on a yearly basis) are missing or are not robust enough to analyse quantitatively trends in the different maritime sectors.

The methodology adopted for this study is based on the basic assumption that data at NUTS 2 level for each NACE code at 4 digits are available. The reproducibility of this exercise therefore relies on the fact that these data are available, collected by countries and based on a common standard methodology as defined by Regulation (EU) 250/2009 of the European Commission.

The lack of data necessarily requires the assessment of experts and the surveying of data through interviews, which may prove to be unsustainable in the long term.

For this reason, with special reference to economic data on the maritime sector, **the availability of structural business statistics at NACE 4 digit — and preferably a more detailed ⁽⁵⁾ — level should be ensured by national statistical institutes** and by EUROSTAT in order to allow an effective and sustainable monitoring of the blue economy of ORs.

Beyond socioeconomic data, the analysis also saw an overall lack of data specific to each maritime activity.

Data on **fishery** catches in some ORs, for instance, are estimates, and do not take into account informal activities ⁽⁶⁾. Data on the resource, namely on the state of stocks, are basically unavailable in all ORs, except for a few species of EU interest monitored within the Control Regulation and species monitored within Regional Management Fisheries Organisations (RFMOs). The same lack of data on stocks monitoring was seen in all sea basins. As the study showed, corroborated by some stakeholders, the lack of data on the fishery sector could be overcome by creating a **regional fishery observatory**, whose purpose could be not only to monitor stocks but also to create knowledge on the sector ⁽⁷⁾.

Other sectors where data gaps are very significant, especially considering their importance for all ORs, are **coastal** and **cruise** tourism. Missing data include the number of cruise ship tourists visiting, stopping, starting or ending a cruise by port; cruise visitors' expenditures; port fees; etc. With regard to coastal tourism, the expenditure of tourists in each region constitutes useful data for monitoring the efficiency and the attractiveness of tourism offer. In this case too, the creation of a **regional observatory for tourism** could support the activation of regular surveys and data collections on the sector for the purpose of monitoring tourist trends and supporting decision-making processes ⁽⁸⁾.

⁽⁵⁾ To distinguish maritime and non-maritime activities aggregated within a similar NACE 4-digit code (e.g. tourism and salt extraction).

⁽⁶⁾ Informal activities are carried out by artisanal boats which do not conform to EU safety standards or do not report catches.

⁽⁷⁾ For more details, please see § 1.1.3.1 of this Report and chapter 4 of Annex 3.

⁽⁸⁾ For more details, please see § 0 of this Report and chapter 13 of Annex 3.

1 Analysis and recommendations on the potential for sustainable blue growth by sea basin and by OR

1.1 Caribbean – Amazonia

The region is best known for its warm, tropical climate, island culture and extreme biodiversity. Because of its biodiversity, the Caribbean-Amazonia is considered a biodiversity hotspot. This natural resource, if well managed, has the potential to make a much greater contribution to poverty reduction and shared prosperity for the sea basin ⁽⁹⁾. However, Caribbean Amazonia countries face a variety of challenges. These challenges include climate change which threatens areas of high biodiversity importance and locally important economic activities and livelihoods. Most of the territories in the Caribbean-Amazonia sea basin have characteristics that make them especially vulnerable to the effects of climate change, such as sea level rise and extreme meteorological events ⁽¹⁰⁾. Furthermore, Caribbean-Amazonia countries share a number of economic challenges which act as major impediments to their growth and development. Local and regional strategies were set up in this basin to tackle some of these challenges. Others need a future attention and further efforts should be done to release the potential of development of these territories.

1.1.1 Mapping of the state of the art of maritime activities

In the paragraphs below the main findings are reported for each maritime activity (from more traditional and largest up to more innovative activities) identified at sea basin level and in each OR. Furthermore, main organisations and actors operating in the maritime sector are also reported. Detailed findings of the maritime activities mapped, main strategies and stakeholders for the Caribbean-Amazonia sea basin and related ORs are reported in Annexes 1, 2, 3, 4 and 10 in the following chapters:

- chapter 1: Mapping of all maritime activities;
- chapter 5: list of public authorities;
- chapter 6: list of maritime strategies;
- chapter 7: list of stakeholders.

1.1.1.1 Fisheries and aquaculture

The fisheries sector of the **Caribbean-Amazonia basin** countries is an important subset of the blue economy, and represents a significant source of nutrition, employment and foreign exchange, contributing also to social and economic stability. It should be noted however that the marine fishery dominates in the overall sector, while the inland fisheries and aquaculture make minor contributions, or are even absent in some territories.

Fishery in the Caribbean-Amazonia sea basin is mainly concentrated in **Suriname** and **Trinidad and Tobago**, operating with industrial and semi-industrial fleets. For most of the territories in the area, including in ORs, the fishing industry is predominantly small scale and artisanal, employing traditional gears, methods and vessels.

One of the most important roles of fisheries in the Caribbean-Amazonia basin is the employment opportunities which the sector provides for thousands of people with low level of education in a region where high levels of unemployment and underemployment continue to be a major concern. In 2014, 64 700 people ⁽¹¹⁾ were directly employed in marine capture fisheries and aquaculture.

With regard to **Guadeloupe** in particular, the fishing sector consists mainly of small scale fishing, and relies chiefly on coastal resources. 89 % of the total number of

⁽⁹⁾ Caribbean Regional Oceanscape Project.

<http://documents.worldbank.org/curated/en/251471468230664274/pdf/ITM00184-P159653-05-19-2016-1463684214909.pdf>.

⁽¹⁰⁾ European Commission, 2014, The economic impact of climate change and adaptation in the Outermost Regions, http://ec.europa.eu/regional_policy/sources/activity/outermost/doc/impact_climate_change_en.pdf.

⁽¹¹⁾ 2014 data for ORs and 2013 data for non-ORs (last year available). Data based on regional statistics for ORs (see details in annexes for each OR) and Caribbean Regional Fisheries Mechanism (CRFM) statistics for non-ORs (see details in Annex 10).

active vessels is less than 9 meters in length, and the average age of boats has progressively increased over the past 20 years (15 years in 2014) ⁽¹²⁾. The average age of fishermen is also increasing, as there is almost no turnover in the sector, due to the difficulty in getting access to funding for buying new boats. Another characteristic is the existence of a structural and significant illegal activity which penalises the whole sector. Conflicts between legal and illegal activities have been reinforced by the establishment of prohibited fishing areas, generating over-exploitation on the continental shelf. Moreover, the sector faces competition from imported products. As highlighted by public institutions and professional bodies, the main challenge for the development of the fishing sector is the construction of new boats, which would enable fishermen to work with higher safety standards, decrease their production costs (with less fuel-consuming vessels) and move away from the continental shelf. The activity is expected to decline significantly if such investments are not supported.

The fishery industry in **Martinique** is mainly operated by small-scale fishermen. It is a part-time job for about two-thirds of the fishermen, and the produce is sold locally as direct sales to consumers, restaurants and retailers. There is a strong pressure on marine stock ⁽¹³⁾, and no further growth is expected in terms of volume landed. Furthermore, due to chlordecone pollution, fishery is forbidden in some coastal areas. As a stakeholders' survey showed, investments both on board (ice and gears) and on landing sites (storage, processing and counters for direct sales) could increase the quality of products and have an impact on sales value. A better organisation of the supply chain could also allow stakeholders to raise the economic performance of the sector.

The fisheries sector in **Saint-Martin** consists of small-scale fishing, and relies mainly on coastal resources. It is characterised by a low number of declared fishermen (12) and a significant non-declared activity (around 80 fishermen). The sector is not structured. There are no fishing ports or organised landing sites. Fish are currently landed in various points, and infrastructures are non-existent ⁽¹⁴⁾. Accessing the resource is also a problem for fishermen. There is no scientific assessment of fish stock states, but according to scientists and professionals, the coastal area is probably over-exploited. Moreover, the fleet is ageing, and there will be a strong need for modernisation in coming years. The fisheries sector is also impacted by the presence of a toxin (ciguatera) that makes some fish species prohibited for fishing. The main driver is a very high level of consumption per inhabitant (and only 20 % of local consumption is covered by local fishing). The structuring of the local supply is nevertheless a necessary condition for creating a sufficient and regular supply for retailers.

As regards **French Guiana**, in 2014 the fishing fleet was composed of 198 vessels, among which 120 are active. Most of this fleet (102) is composed of small vessels, with a length of between 7 and 12 m. It should be considered that the level of education is particularly low for fishermen: 93.6 % of people involved in the fishery sector have no academic qualification, or just a primary school title ⁽¹⁵⁾. Furthermore, the profitability of the sector remains low due to a stagnation of fish prices and low innovation and modernisation in the sector. The prospects for the sector in French Guiana are stable if there are no changes to the sector.

With regard to **aquaculture**, the territories having the features of a developing aquaculture industry in the Caribbean-Amazonia sea basin are mainly **Suriname**,

⁽¹²⁾ Système d'Information Halieutique (SIH) Guadeloupe, Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER).

⁽¹³⁾ Economie Bleue en Martinique, ACTeon, Creocan, SCE for Direction de la Mer, 2016.

⁽¹⁴⁾ An exception is Grand Etang, where a dock and a piece of land are dedicated to fisheries, but with very limited technical means. The establishment of two organised landing sites is planned, supported by ERDF and EMFF.

⁽¹⁵⁾ Tableau de bord sur les profils socioprofessionnels des marins de la filière pêche en Guyane 2009-2014, Observatoire Régional Emploi Formation (OREF).

Trinidad & Tobago and **Martinique** (15 aquaculture sites in operation in Martinique in 2015), and to a lesser extent **Dominica**, **St. Lucia** and **Guadeloupe** (5 sites). For other territories, aquaculture remains at an experimental stage.

In **Guadeloupe**, there is a marine (producing drum and tilapia) and 4 freshwater sites (producing freshwater shrimps, declining because soils are contaminated with chlordecone). According to stakeholders and as highlighted in regional strategies ⁽¹⁶⁾, there is a potential for aquaculture production in Guadeloupe: technical solutions have been found to preserve farms from hurricanes (submersible cages systems), water temperature conditions are favourable, technical production is well mastered on the two species produced. Nevertheless, the difficulty for project holders to get maritime concessions and to get access to financing is a strong limit to the development of the activity. Moreover, production costs are high (as regards feed in particular) and as for fisheries, there is a strong competition with imported fish.

As mentioned above, in **Martinique** there are 15 active sites, mainly farming red drum and, to a lesser extent, bluefin trevally. The produce is sold locally to consumers, retailers and restaurants. The production in Martinique has declined in recent years, due to 1) the effects of cyclone Dean, 2) the difficulty in supplying juveniles, and 3) the change in the content of feed on the market in 2012, which has decreased fish growth.

In Saint-Martin and French Guiana, there is no aquaculture production. In **Saint-Martin**, however, the local authority aims to develop this activity with support from the European Maritime and Fisheries Fund (EMFF). In **French Guiana**, some projects have been already identified (oyster farming, continental fish farming of shrimp, atipa, tambaqui and catfish).

1.1.1.2 Coastal tourism

Tourism is a key part of the economy of most, if not all, **Caribbean and Amazonia Basin** countries, particularly the islands, especially after the crisis of other sectors, such as agriculture and manufacturing. For some, it accounts for almost the whole economy. The sector constitutes a substantial source of employment, directly supporting an estimated 204 575 jobs ⁽¹⁷⁾ in 2014.

The Caribbean and Amazonia region has developed various tourism products, with particular emphasis on its natural assets (sea and beach): sea-sand-sun and cruise tourism are the main tourism products supplied by the region. Other products such as ecotourism, cultural tourism and health tourism have very good potential, but they are still undeveloped and underestimated in the area. In this context, Barbados is considered as a significant player in the global ecotourism sector.

The tourism system has not been adequately developed towards local community development because the current tourism supply is essentially managed by partnerships involving international hotel chains, airlines and tour operators, promoting all-inclusive holidays.

The mass-tourism arrivals in the region are seriously threatening the environment, which is the basic resource on which tourism has been developed in the area. There are no national or regional policies to protect and preserve the environment. This issue is particularly challenging with regard to the real gap and lack of dialogue between public and private sectors in order to develop a common understanding of the importance of sustainable tourism development to the Caribbean region and related countries.

⁽¹⁶⁾ Regional scheme for the development for aquaculture (SRDAM).

⁽¹⁷⁾ Estimates based on available data from national statistics and the World Travel & Tourism Council. Detailed data are provided in the annex on the Caribbean-Amazonia basin.

In **Guadeloupe**, tourism accounts for around 5 % of regional gross domestic product (GDP) ⁽¹⁸⁾. A total of 490 000 tourists came to Guadeloupe in 2013. A study carried out by the National Institute for Statistics and Economic Studies (INSEE) in 2012 estimated that 70 % of the jobs linked to the blue economy were in the coastal tourism sector in Guadeloupe. Since 2010, the sector in general has grown, and the number of tourists has continuously risen. Professional and local actors have been involved in different actions aimed at developing the attractiveness of the destination, and national promotion campaigns and awareness campaigns targeted at the local population have been launched.

Tourism in **Martinique** has remained more or less stable over the last 20 years ⁽¹⁹⁾: it peaked in 1999 (654 355 tourists, excluding cruise tourism) and remained between 500 000 and 570 000 tourists between 2001 and 2015. The total expenditure of tourists reached EUR 306.8 million in 2015 ⁽²⁰⁾ (+24 % since 2008). 'Long stay' tourists account for almost two thirds of the total number of tourists (63 %) and 93 % of income. Yachting tourists account for 5 % of the number of persons and 4 % of income from tourism. Tourists from cruises account for 31 % of the number of tourists, and 'only' account for 3 % of the income from tourism (see following section on cruise tourism for more details).

This sector has positive prospects, due to (i) the positive image of Martinique for people sailing in the Caribbean area, and (ii) the organisation of the sector in providing a full range of services for sailors (notably the marina in Le Marin). A regional strategy is under development in Martinique, being drawn up by the Regional authority, in order to support the development of the sector.

Tourism is a major economic sector also in the island of **Saint-Martin**. In 2015, one employee out of four was working in this sector on the French side ⁽²¹⁾. More than 100 000 tourists arrived in the French part, less than 5 % of the total number of tourists registered on the island (2.5 million). Yachting makes up a significant component of tourism activity, and encompasses a wide range of activities ⁽²²⁾. A project has been launched by CCISM for the definition of a development programme for yachting, based on a diagnosis of the industry, also for the purpose of increasing knowledge of the sector. Saint-Martin is an attractive destination for boat owners, due to its position between Anguilla and Saint-Barthelemy, a good level of services and good mooring conditions. Saint-Martin's marinas benefit from lower taxes and are more attractive than on the Dutch side. Saint-Martin's marinas have a capacity of 750 berths (400 on the Dutch side) ⁽²³⁾.

The only OR in which the tourism sector is not well developed is **French Guiana**. In 2015 ⁽²⁴⁾, 220 000 visitors came to French Guiana. Almost half of the visitors came for professional reasons (48 %), one third (33 %) came to visit family and friends, and only 17 % came for leisure purposes. Compared to territories in the Caribbean area, French Guiana has limited beaches with clear and blue waters (due to sediments

⁽¹⁸⁾ Institut d'Émission des Départements d'Outre-mer (IEDOM), 2005 being the last official estimate: http://www.iedom.fr/IMG/pdf/ne305_eclairage_tourisme_quadeloupe.pdf.

⁽¹⁹⁾ Based on data from 'Comité Martiniquais du Tourisme'.
<http://martinique.media.tourinsoft.com/upload/PRES-BILAN-2004-2014-Vers-Finale-2.pdf> and
<http://martinique.media.tourinsoft.com/upload/SYNTHESE-BILAN-TOURISME-2016-2.pdf>.

⁽²⁰⁾ Based on data from 'Comité Martiniquais du Tourisme':
<http://martinique.media.tourinsoft.com/upload/PRES-BILAN-2004-2014-Vers-Finale-2.pdf> and
<http://martinique.media.tourinsoft.com/upload/SYNTHESE-BILAN-TOURISME-2016-2.pdf>.

⁽²¹⁾ Data from URSSAF ('Union de Recouvrement des Cotisations de Sécurité Sociale et d'Allocations Familiales') in IEDOM (Institut d'émission des départements d'outre-mer) report 'Saint-Martin, 2015'. http://www.iedom.fr/IMG/pdf/ra2015_saint-martin.pdf.

⁽²²⁾ Data from Office du Tourisme de Saint-Martin, Grand-case airport, Port de Marigot.

⁽²³⁾ Report 'Filière Nautisme et Plaisance de l'Île de Saint-Martin — Assistance technique pour la construction du cahier des charges de l'étude — Enquête auprès des professionnels', Chambre de Commerce Interprofessionnelle de Saint-Martin. Report not available online.

⁽²⁴⁾ Observatoire du tourisme de Guyane, Tourisme en Guyane — Chiffres clés 2015.

carried by Amazonian rivers). The main activity for tourists is however 'beach' (for 52 %), and many other activities are related to sea or rivers.

A specific project on Blue tourism is currently under development: this will focus on coastal tourism, yachting, cruise tourism and connections between coastal areas and inland areas. The objective is to develop a project certified under the 'Odyssea Blue Tourism' scheme.

1.1.1.3 Cruise tourism

The **Caribbean** area was the most visited cruise destination in the world in 2014 ⁽²⁵⁾. Cruise tourism is the second largest tourism product, considering arrivals in the area, with approximately 24 million cruise passenger arrivals in 2014 (according to the Caribbean Tourism Organization (CTO), a figure that rose by 11 % in 2015 ⁽²⁶⁾).

Sint Marteen (NL) is the leading destination of all Caribbean destinations, with over EUR 318 million in cruise tourism expenditures, generating an estimated 9 259 jobs in 2014 ⁽²⁷⁾. However, the impact on the local economy of this type of tourism product is quite small compared to other tourism-related activities (beaches, yachting, sport tourism, culture and events, ecotourism and health tourism). It made up nearly 2 % of revenue of the tourism sector in the Caribbean and Amazonia basin in 2015 ⁽²⁸⁾. The growth in cruise travel in the Caribbean in recent decades is expected to continue as new cruise itineraries are developed.

For the Outermost regions, cruise tourism is also a growing sector, particularly for **Guadeloupe**. A better organisation of the sector as well as better infrastructures would facilitate the development of the sector across the region. Cruise activity had been booming up until 2015. 95 % ⁽²⁹⁾ of traffic relates to cruises based in Guadeloupe, with tourists arriving at Pointe-à-Pitre airport. The customer base is mainly European.

Martinique is an important cruise destination as it can receive large international cruise ships in Fort-de-France harbour. In 2015, there were 175 stops (+25 stops compared to 2014) and 241 623 passengers (+63 837 compared to 2014) ⁽³⁰⁾. Cruise tourism has resumed its growth since 2012. This recovery is due to strong efforts from stakeholders to attract cruise companies to Martinique, highlighting the assets of the island: beaches, food, landscape, etc. but also security and health equipment. Tourists from cruises account for 3 % of the income from tourism in Martinique. The impact of cruise tourism is higher when synergies between cruise tourism and coastal tourism are high (services proposed to cruise tourists during their stay). In addition, the economic impact of cruise tourists who start or end their cruise in Martinique is higher than the economic impact of tourist who only makes a stop: they have a flight to Martinique, spend one night in a hotel, etc.

The number of cruise passengers arriving in **Saint-Martin** has been relatively stable since 2012, but is down on previous years. Cruise activity on the French side is uncertain due to difficult climatic conditions (swell) and the absence of a dock. In 2014, many stopovers were cancelled. The French part of the island suffers the competition of the Dutch part.

⁽²⁵⁾ Structural analysis of cruise passenger traffic in the world and in the Republic of Croatia, Donald Sciozzi, Tanja Poletan Jugović, Alen Jugović, 2015, https://www.researchgate.net/publication/283102615_Structural_analysis_of_cruise_passenger_traffic_in_the_world_and_in_the_Republic_of_Croatia.

⁽²⁶⁾ Economic contribution of cruise tourism to the destination economies 2015, <http://www.f-cca.com/downloads/2015-cruise-analysis-volume-1.pdf>.

⁽²⁷⁾ Economic contribution of cruise tourism to the destination economies 2015, <http://www.f-cca.com/downloads/2015-cruise-analysis-volume-1.pdf>.

⁽²⁸⁾ Economic contribution of cruise tourism to the destination economies 2015, <http://www.f-cca.com/downloads/2015-cruise-analysis-volume-1.pdf>.

⁽²⁹⁾ Florida Caribbean Cruise Association. <http://www.f-cca.com>.

⁽³⁰⁾ Data from 'Comité Martiniquais du Tourisme'.

As regards **French Guiana**, there is an increasing development of cruise tourism, with international ships making stops in Salut Islands and in Cayenne (Degrad-des-Cannes). In 2012, there were about 18 000 cruise tourists in the OR. However, the limited draught of French Guiana ports, poor local infrastructure and the organisation of the sector mean that the sector cannot be exploited further in the short term. The distance from the main international cruise routes places a strong limitation on the development of the activity.

1.1.1.4 Shipping

The insular nature of most countries in the **Caribbean-Amazonia** basin is reflected in the importance of ports and maritime services for trade. Maritime transport takes place in the context of: i) imports of manufactures to satisfy local demand and tourist industries; ii) exports of primary products, which have decreased slowly across the region. The position of Caribbean countries within the global container shipping network is influenced by two contrasting situations. One is the intermediary in the main global routes, the other is the situation of 'isolated' small islands, without significant hinterlands. Furthermore, the restriction of global container shipping networks within a hierarchical hub and spoke conformation ⁽³¹⁾ poses significant threats and challenges, especially to the smaller islands.

Overall, Caribbean ports have been segregated into three categories: (i) global hub ports, which relay ports serviced by global container lines connecting three or more continents; this category includes three ports in the Caribbean region (port of Kingston in Jamaica, port of Caucedo in Dominican Republic and port of Freeport in Bahamas) ⁽³²⁾; (ii) sub-regional hub ports, which are secondary relay ports where cargoes are relayed to surrounding Caribbean Islands (port of Spain and port of Saint Lisa in Trinidad and Tobago); (iii) service ports, which are small ports serving specific Islands with limited infrastructure and limited connections to larger ports (port of St. John's in Antigua and Barbuda and port of St. George's in Grenadines). At a regional scale, 'artisanal' inter-island services exist, and play a noteworthy role.

It is worth underlining that a customs union is being implemented within the organisation of Eastern Caribbean States (OECS), for the purpose of facilitating intra-regional trade. This will include the removal of import formalities on goods traded within the Customs Union, and the harmonisation of border and regulatory procedures with respect to goods imported from countries outside the region.

Ambitious projects have been proposed in **French Guiana** to develop a multi-purpose offshore platform 10 to 20 ha in size. The project is led by Grand Port Maritime de Guyane with the support of Direction des Constructions Navales Services (DCNS). Further studies are needed to assess the feasibility of the project (based on interview, the estimated costs are EUR 1-1.5 billion) ⁽³³⁾.

Large infrastructures are also available in Guadeloupe and Martinique, which aim to attract more traffic (due to the Panama Canal expansion). In **Guadeloupe**, the port sector's ambition is to become a regional hub for transshipment in the Caribbean area. Nevertheless, there is strong competition on freight rates between vessels owners in a depressed global context. As regards passenger transport, there has been a development of intra-archipelago lines and passenger numbers in recent years. It is now considered to be in over-capacity, with a high level of competition between operators whose profit margins have fallen. The investments made in the port (dredging and draught increase to 16 meters in the channel) open up the possibility for larger vessels to arrive in the port of Jarry.

⁽³¹⁾ The 'hub and spoke' is a system of connections in which all traffic moves along spokes (mid to small sized terminals) connected to the hub (large major terminals) at the centre.

⁽³²⁾ These countries are not in the scope of this study.

⁽³³⁾ Grand Port Maritime de Guyane.

In **Martinique**, recent investments have been allocated to Grand Port Maritime de la Martinique, in order to ensure the development of maritime transport in the OR (both freight and passenger). Passenger ferry transport relates to services between Martinique and other islands (notably Guadeloupe), and intra-Martinique. Freight transport is mainly concentrated in the area of Grand Port Maritime de la Martinique. Oil accounts for a large share of freight in Martinique, due to the presence of SARA refinery. The company imports crude oil and exports refined oil to Guadeloupe and French Guiana.

In **Saint-Martin** freight transport suffers competition from the Dutch side, which is better equipped due to its deeper draught. Direct international lines operate from the commercial port of Sint Maarten, with the United States or with mainland France. The port of Galisbay is dedicated to commodity transport, handling 30 % of commodity trading on the island. The port's growth depends on its capacity to increase its market share of commodity traffic on the island. To this end, the port has launched feasibility studies for its expansion and in particular for the increase of its draught (to 12 meters) which would permit the landing of larger boats, which are currently landing on the Dutch side. Passenger ferry services connect Saint-Martin with neighbouring islands.

1.1.1.5 Marine renewable energies

Marine renewable energy in the basin is at a pre-development stage. However, assessments conducted in the context of the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) indicate a significant potential for wind energy for some of the Caribbean Community (CARICOM) ⁽³⁴⁾ states. Further on-site feasibility studies on offshore wind potentialities as regards the community impact, the economic cost and the environmental footprint are foreseen in the next years, under the umbrella of the C-SERMS. Future actions within the CARICOM States will largely depend on the results of these studies. Thus, as it is an emerging sector, and commercial success has not yet been demonstrated, there are significant challenges to be overcome in establishing successful marine renewable energy in the Caribbean.

Researches in the framework of the C-SERMS have also demonstrated that Ocean energy technologies — including wave and tidal power generation, ocean thermal energy conversion (OTEC), and salinity gradient technologies — may offer significant opportunities for power generation. However, the C-SERMS considered that the potential of ocean energy technologies in the Caribbean area will depend greatly on the maturing of technologies and a decrease in their costs ⁽³⁵⁾.

In **Guadeloupe**, a feasibility study ⁽³⁶⁾ has been carried out on the potential of floating wind farms. This resulted in the identification of a possible site, taking into account the hurricane risk in particular. Another project has focused on Seawater Air Conditioning. A feasibility study has been carried out on the air conditioning of the hospital of Basse-Terre. The conclusion was that the project should be extended to other administrations and the general public in Basse-Terre ⁽³⁷⁾.

⁽³⁴⁾ The Caribbean Community (CARICOM) is a regional organisation regrouping 15 Member States (Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago) and 5 Associate members (Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands) from the Caribbean region. It aims to strengthen links between states in the area and to create a common single market. ORs are not members of CARICOM.

⁽³⁵⁾ Caribbean Sustainable Energy Roadmap and Strategy, http://www.worldwatch.org/system/files/C-SERMS_Full_PDF.pdf.

⁽³⁶⁾ Study led by Akuo Energy Caraïbes for the French Environment and Energy Management Agency (ADEME) and the regional authority, <http://www.guadeloupe-energie.gp/wp-content/uploads/150715-Etude-Potentiel-Eolien-Flottant-Guadeloupe.pdf>.

⁽³⁷⁾ Study led by Deprofundis Ingenium for ADEME and EDF Guadeloupe.

In **Martinique**, an Ocean Thermal Energy (OTE) project, called NEMO, is currently under development. This project is supported by NER 300, the EU programme for innovative low-carbon energy demonstration projects ⁽³⁸⁾. This project aims to establish an offshore plant (5 km from the coast) which will provide 16 MW of power, supplying energy to 35 000 households. This technology is based on the difference in temperature between the surface and the depth of the sea.

Another project, NAUTILUS, aimed to establish an OTE plant on the island coast. This project was shelved in 2015, notably due to the environmental impact of the project (installation of pipelines on the coast).

There is no maritime renewable energy in **French Guiana** at present. The regional programme for energy planning ⁽³⁹⁾ identifies tides, waves, stream and thermal energy as sources of marine energy, and states that each of these sources should be further investigated. No detailed analyses are available, and a feasibility study should be launched by regional authority on the potential energy production with maritime streams.

1.1.1.6 Blue biotechnology

In the **Caribbean-Amazonia** basin, a number of medicines have been developed in the past from the Caribbean coral reefs, such as the Antiviral drugs (Ara-A and AZT), the anticancer agent (Ara-C) developed from the Caribbean sponge *Tethya crypta* found on the Caribbean reef, the Didemnin B isolated from the Caribbean tunicate *Trididemnum solidum* and the Ecteinascidin-743 derived from the colonial tunicate *Ecteinascidia turbinata* living in the Caribbean). Clinical trials are underway until now to test the application of these components to treat many diseases and cancers ⁽⁴⁰⁾. The high biodiversity in the Caribbean Sea represents the world's most abundant, but least utilised, resources.

In this context and with regards to the utilization of genetic resources, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, entered into force on 12 October 2014. It aims at sharing the benefits arising from the utilisation of genetic resources in a fair and equitable way contributing to the conservation of biological diversity and the sustainable use of its components (as established in the Article 1) ⁽⁴¹⁾.

In **Guadeloupe**, the region launched a call for projects in 2015 for the valorisation of *sargassum* weeds. Several projects have been selected. They focus on the agronomic valorisation of sea weeds, composting, biogas production, bio-plastics production and the development of feed use or cosmetic use. Moreover, a seaweed culture project for cosmetic use has been launched by a private operator, Vimera. It is currently running an experimentation station of 1 000 m².

The blue biotechnology sector is also at a pre-development stage in **Martinique**, with the objectives of valorising *Saragassum algae*, sea sponge and spirulina. The research is led by research institutes — IFREMER ⁽⁴²⁾, UAG ⁽⁴³⁾, CIRAD ⁽⁴⁴⁾, INRA ⁽⁴⁵⁾ — and

⁽³⁸⁾ https://ec.europa.eu/clima/policies/lowcarbon/ner300_en.

⁽³⁹⁾ SRCAE — Schéma régional climat air énergie, 2012.

⁽⁴⁰⁾ Drugs and cosmetics from the Sea.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3783861/#b13-marinedrugs-02-00073>.

⁽⁴¹⁾ Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity.

<https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf>.

⁽⁴²⁾ IFREMER: 'Institut Français de Recherche pour l'Exploitation de la Mer'.

⁽⁴³⁾ UAG: 'Université des Antilles et de la Guyane'.

⁽⁴⁴⁾ CIRAD: 'Centre de coopération internationale en recherche agronomique pour le développement'.

⁽⁴⁵⁾ INRA: 'Institut National de Recherche Agronomique'.

private stakeholders. ADEME ⁽⁴⁶⁾ launched a call for projects in Martinique in 2015 on the collection and valorisation of *sargassum*. The most promising fields are compost, agricultural uses (fertiliser) and bioplastic.

1.1.1.7 Other maritime activities

The following table reports all other maritime activities identified in the sea basin, describing them for each OR (or at sea basin level). Detailed analyses carried out on these activities are reported in Annexes 1, 2, 3 and 4 for ORs and Annex 10 for the Caribbean-Ama-zonia as a whole.

Extraction of oil and gas
<p>Oil and gas extraction have direct impacts on the environment and on the bio-resources. The development of such activities is not in line with sustainable blue growth. The following paragraph provides an overview of the activity in the sea basin.</p> <p>In the Caribbean-Ama-zonia sea basin, only Trinidad and Tobago and Barbados have both oil and natural gas reserves. Suriname has only oil production. Trinidad and Tobago is the Caribbean's largest producer of oil and gas, and the only significant exporter. No further development is expected in the short and medium term for this activity. Exceptions can be made for Trinidad and Tobago and Grenada, where the expansion of offshore activities is expected, and for French Guyana, where research is in progress.</p> <p>In French Guiana, in 2011 oil drilling was positive, with oil detected at a depth of 6 000 m. An environmental assessment of the exploration undertaken in 2012 showed that oil exploration in French Guiana had a direct impact on marine bio-resources, the largest impact related to seismic waves on cetaceans and turtles, and to a lesser extent on fish. The presence of nautical equipment and vibrations also have an impact on fish, cetaceans and turtles. Exploration may also have an impact on other activities due to the presence of facilities, vibrations and seismic wastes, and on other sectors (fisheries, maritime transport) ⁽⁴⁷⁾. These impacts will be continuously analysed and monitored in case of further exploration and exploitation of oil resources.</p> <p>The potential for development of this activity is limited as the French Ministry in charge of environment indicated in June 2017 its objective to stop oil exploration and extraction in both Metropolitan France and Outermost Regions. A legislative text shall be proposed during the autumn 2017 ⁽⁴⁸⁾.</p>
Extraction of aggregates
<p>Extraction of aggregates has direct impacts on the environment and on the bio-resources. The development of such activities is not in line with sustainable blue growth. The following paragraph provides an overview of the activity in the sea basin.</p> <p>Extraction of mineral commodities in the Caribbean-Ama-zonia sea basin moderately serves local economies. This is the case for Barbados, Dominica and Saint Vincent and the Grenadines, where the mining sector play a minor role in their economies. For some territories, sand mining contributes significantly to their economy, such as Antigua, where sand mining has historically been the largest industry on the island, and Montserrat, where sand mining is one of the two main activities that generate economic income. For Montserrat, there is a large potential market for Montserrat's sand thanks to the high-quality product. On the other hand, beach restoration and coastal protection has become a major concern in the Caribbean.</p> <p>Also in Guadeloupe, the extraction of marine sand for the construction industry was observed. One operator is active.</p>
Extraction of salt
<p>Extraction of salt has been identified in Anguilla (average of 37 000 to 40 000 barrels produced yearly) and in Saint Vincent and the Grenadines, where salt is produced ⁽⁴⁹⁾.</p>
Desalination
<p>Most Caribbean islands share the same unique challenges with regard to providing pure and potable water for their inhabitants. Many islands depend largely on desalination to satisfy the increasing demand for fresh water, mostly due to tourism. Thus, this technology is becoming an</p>

⁽⁴⁶⁾ ADEME: Environment and Energy Management Agency.

⁽⁴⁷⁾ Permis d'exploration Guyane Maritime — Réalisation d'une campagne sismique 3D — Volume 1 — Résumé non technique du document d'appréciation des impacts environnementaux (DAIE) sismique — CREOCEAN for Shell, 2012.

⁽⁴⁸⁾ http://www.lemonde.fr/planete/article/2017/06/23/nicolas-hulot-s-engage-a-interdire-tout-nouveau-permis-d-exploration-d-hydrocarbures_5150067_3244.html.

⁽⁴⁹⁾ The Mineral Industries of the Islands of the Caribbean, 2011. <https://minerals.usgs.gov/minerals/pubs/country/2011/myb3-2011-aa-bf-bb-uc-cu-jm-td.pdf>.

increasingly integral part of the region's search for water security. Since 2007, 68 new desalination plants have been built across the Caribbean, which now boasts an installed capacity of 782 000 cubic metres of purified water per day, according to the Caribbean Desalination Association (CaribDA).

Desalination plants are becoming easier to operate. Additionally, the cost of the technology seems to be going down, which is making desalination more affordable. The increasing cost of energy however remains an ongoing challenge, and may be cancelling out any gains made with respect to the capital cost of plants. For this reason, the development of renewable energy could represent a significant opportunity for the availability of sustainable sources of energy for desalination.

For ORs, desalination activities occur only in **Saint-Martin**, where all potable water comes from desalination. One plant (Union Caraïbe de Dessalement d'Eau de Mer – UCDEM, subsidiary of Veolia) has supplied the whole French side of the island since 2006.

Desalination remains a costly way to produce freshwater, and research projects are currently being carried out to analyse the potential of alternative sources, notably groundwater resources.

Shipbuilding and ship repair

Shipbuilding is a small activity in insular territories as it is cheaper to import boats by sea than to import materials and build boats locally, except in the case of handcrafted production using wooden products. Nevertheless, boat building activity has been identified in Anguilla, Guadeloupe and Sint Marteen (NL). This activity is important for the attractiveness of each territory for yachting and maritime transport, but also for fishing.

In **Guadeloupe** one significant operator located in the port area specialises in superyacht repairs. Another major operator specialises in both fishing and recreational boats. There are also several small operators. There is a potential for ship repair activity, with the forecast development of yachting and the objectives of developing the activity around large-scale pleasure boats.

In **Martinique**, ship repair activity consists of two sub-sectors: one for larger vessels, up to 130 m (Fort-de-France area) and another for small vessels in Le Marin area. One company is involved in ship dismantling. The prospects for ship repair are positive, and Martinique aims to occupy a central position in the Caribbean area for ship repair for all types of vessels.

1.1.1.8 Main organisations and actors operating in the maritime sector

In this paragraph, main public and private stakeholders operating in the sea basin and in each OR are reported, highlighting for each of them the related role in the relevant policies and maritime activities.

Table 2 – List of main organisations and actors operating in the Caribbean-Azononia sea basin

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
Caribbean—Amazonia	Association of Caribbean States (ACS)	Public actor	All maritime sectors	ACS's main role is to strengthen regional cooperation and the integration process with a view to creating an enhanced economic space in the region, preserving the environmental integrity of the Caribbean Sea and promoting the sustainable development of the Greater Caribbean. ORs are associate members of ACS.
Caribbean—Amazonia	Caribbean Community: CARICOM	Regional organisation	All maritime sectors	CARICOM aims to strengthen links between States in the area and to create a Common Single Market. Several regional strategies were developed in the framework of this organisation in the fields of fisheries, energy and transport. CARICOM works in four main areas: economic integration; foreign policy coordination; human and social development; security. ORs are not members of CARICOM.
Caribbean—Amazonia	The Caribbean Tourism Organisation (CTO)	Regional organisation	Tourism (coastal and cruise tourism)	The regional tourism development agency has 32 member states and several private actors are members. The main objective is to provide its

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
				<p>members with the services and information necessary for the development of sustainable tourism for the economic and social benefit of the Caribbean by:</p> <ul style="list-style-type: none"> • Encouraging collaboration among countries and other partners; • Taking on a promotional and marketing role; • Sharing information and knowledge among its members, e.g. organising collective CTO forums; • Providing advice, technical assistance and consultancy services. <p>ORs are members of CTO</p>
Caribbean—Amazonia	Caribbean Regional Fisheries Mechanism (CRFM)	Intergovernmental organisation of Caribbean States	Fisheries and aquaculture	<p>Establishing appropriate measures for the conservation, management, sustainable use and development of fisheries resources and related ecosystems. Strengthening the skills of fishermen across the region, optimising social and economic returns from the fisheries sector. Promoting competitive trade and stable market conditions. ORs are not members of CRFM.</p>
Caribbean—Amazonia	Caribbean Shipping Association (CSA)	Professional organisation	Shipping (Maritime transport and ports)	<p>Exchange of information and ideas essential to development, thereby assisting members to improve efficiency, production and output. Training and development of human resources in the Caribbean shipping industry.</p>
Caribbean—Amazonia	Florida Caribbean Cruise Association (FCCA)	Professional organisation	Cruise tourism	<p>Fostering an understanding of the cruise industry and its operating practices to build cooperative relationships with its partners' destinations and developing productive bilateral partnerships with all sectors.</p>
All EU ORs	Cluster Maritime	Professional organisation	All maritime sectors	<p>The French Maritime Cluster intervenes in three areas: institutional communication, operational synergies and influential actions.</p>
All EU ORs	Comité Régional des Pêches et des Elevages Marins	Professional organisation	Fisheries and aquaculture	<p>A professional organisation that represents fishermen and promotes and defends the interests of their professional activities.</p>
All EU ORs	Direction de la Mer (DDM)	Public actor	All maritime sectors	<p>Administration in charge of the implementation of policies related to the sustainable development of maritime space.</p>
All EU ORs	Service Territoire, Mer, Développement Durable	Public actor	All maritime sectors	<p>Administration in charge of the implementation of policies related to sustainable development.</p>
All EU ORs	Chambre de Commerce et d'Industrie	Public actor	All maritime sectors	<p>Supporting and representing economic actors.</p>
All EU ORs	Office du tourisme	Public actor	Tourism	<p>Tourism promotion and development.</p>
All EU ORs	Collectivité territoriale	Regional administratio	All maritime sectors	<p>Regional authority.</p>

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
		n		
French Guiana	Association Aquacole de Guyane (AAG)	Professional organisation	Aquaculture	Represents and defends its members at technical, social and administrative levels. Works towards the development of sustainable aquaculture. Promotes aquaculture products.
Martinique	Association pour le Développement de la Production Aquacole Martiniquaise (ADEPAM)	Professional organisation	Aquaculture	Represents its members in administrations and with partners in the sector. Promotes aquaculture products. Ensures the exchange of technical methods among members and producers from other regions.
Martinique	Martinique Yachting Association (MYA)	Professional organisation	Port Maritime transport Coastal tourism	Promotion of yachting activities (including organisation of events). Statistical monitoring of activity.
Martinique	AKUE Energy	Private operator	Renewable energy	Development of Ocean Thermal Energy project.
Guadeloupe	Syndicat des producteurs aquacoles de Guadeloupe SYPAGUA	Professional organisation	Aquaculture	Represents and defends producers. Promotes the development of aquaculture in Guadeloupe.
Guadeloupe	UMEP (Union Maritime et Portuaire)	Professional organisation	Maritime transport, port activities	UMEP is the link between the members of the port community, a tool at the service of customers, in particular for vocational training.
Guadeloupe	CMA CGM	Private operator	Maritime transport (freight)	Maritime transport and freight services.
Guadeloupe	Marina Bas du Fort	Marina	Tourism (Yachting)	Administrator of the main marina — Owner of aqua lodges.
Guadeloupe	Valorem	Private operator	Renewable Energy	Study on the feasibility of a floating wind farm.
Saint-Martin	Direction des Services Vétérinaires	Public	Fisheries	Administration in charge of health inspections in the food chain.
Saint-Martin	National marine reserve of Saint-Martin	National reserve	All maritime sectors	Support and representation of economic actors.
Saint-Martin	Port of Galisbay	Commercial port	Port, maritime transport, cruise tourism, Ship repair	Commercial port.

1.1.2 Identification of most important maritime activities

Maritime-based economic activities contribute significantly to the overall economy of Caribbean countries. Of these, **coastal tourism, cruise tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** play a major role in the overall Caribbean economy, given that (i) all these activities have been identified in all countries and ORs and (ii) they present the highest level of development in almost all territories. Since quantitative data for maritime activities are not uniformly available in all territories making up the sea basin, the following table analyses the intensity of each maritime activity in each territory of the Caribbean sea basin.

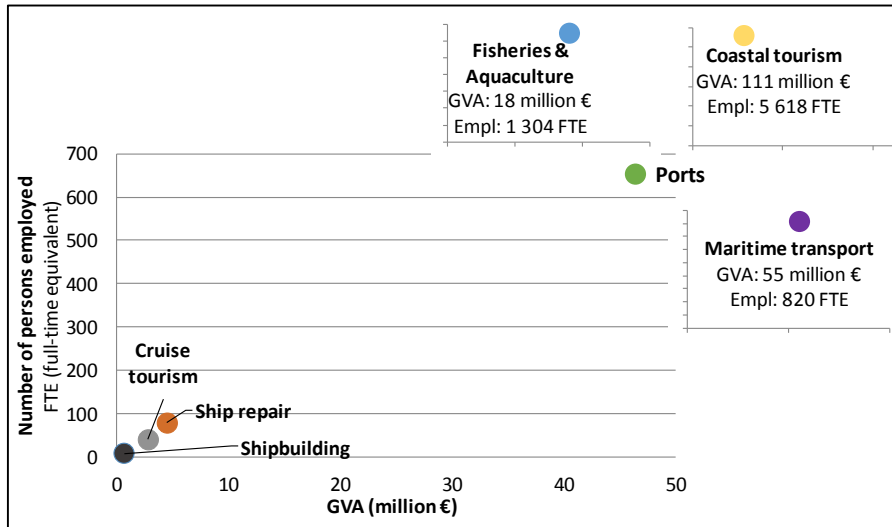
Table 3 – Map of maritime activities identified in the Caribbean-Amazonia sea basin

Group	Sectors	ORs				Others													
		French Guiana	Guadeloupe	Martinique	St Martin (FR)	Amapa	Anguilla	Barbuda and Antigua	Barbados	Dominique	Grenada	Montserrat	St Barthelemy	St Lucia	Sint Marteen (NL)	St Vinc & Gren	Suriname	Trinidad & Tobago	
Living resources	Fisheries and aquaculture	XX	XXX	XXX	X	X	X	XX	XX	X	XX	X		X	X	X	XXX	XXX	
	Blue biotechnology																		
Non-living resources	Extraction of oil and gas	X							X								X	XXX	
	Extraction of aggregates		X			X	X		X	X	X	X				X	X	X	
	Extraction of salt						X	X		X						X			
	Seabed mining					X			X	X									
	Desalination				X			X	X		X			X	X			X	
	Maritime transport	X	XX	XX	X	X	X	X	XX	X	X	X	X	XX	X	X	XXX	XXX	
Shipping	Ports (including dredging)	X	XX	XX	X	X	X	X	XX	X	X	X	XX	X	X	XXX	XXX		
	Shipbuilding		X		X		X												
Shipbuilding	Ship repair		XX	XX	XX			X						XX					
	Coastal tourism	X	XXX	XXX	XX	X	XX	XX	XXX	XX	XX	X	X	XXX	XX	XX	X	XXX	
Tourism	Cruise tourism	X	XX	XX	X		X	X	XXX	XX	XX		X	XXX	XXX	X		X	
	Wind energy																		
Marine renewable energy	Other marine renewable energies																		

Legend		Activity not identified on the territory
	X	Low development of the activity on the territory
	XX	Medium development of the activity on the territory
	XXX	Strong development of the activity on the territory

Looking at the blue economy of each OR, these four activities are those with the highest socio-economic impact on local economies, as the charts below show.

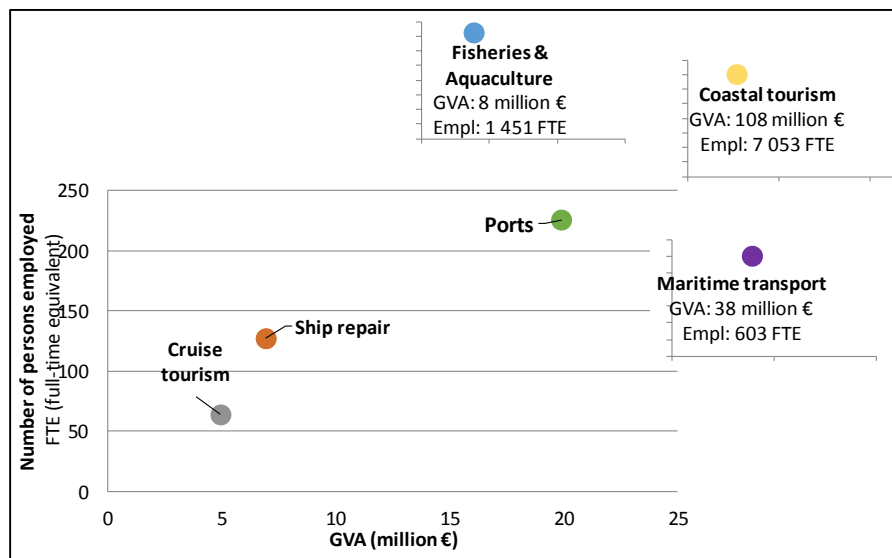
Figure 4 – Guadeloupe maritime activities and socio-economic impact



Source: our elaboration on INSEE data. 2014 data for fisheries and aquaculture and GVA of tourism. All others are 2013.

In Guadeloupe, the top four maritime activities with the highest socio-economic impact are fisheries and aquaculture, coastal tourism, maritime transport and ports. Ship building and ship repair play a marginal role, while cruise tourism presents a low value, since it does not include effects generated by the activity on satellite businesses.

Figure 5 – Martinique maritime activities and socio-economic impact

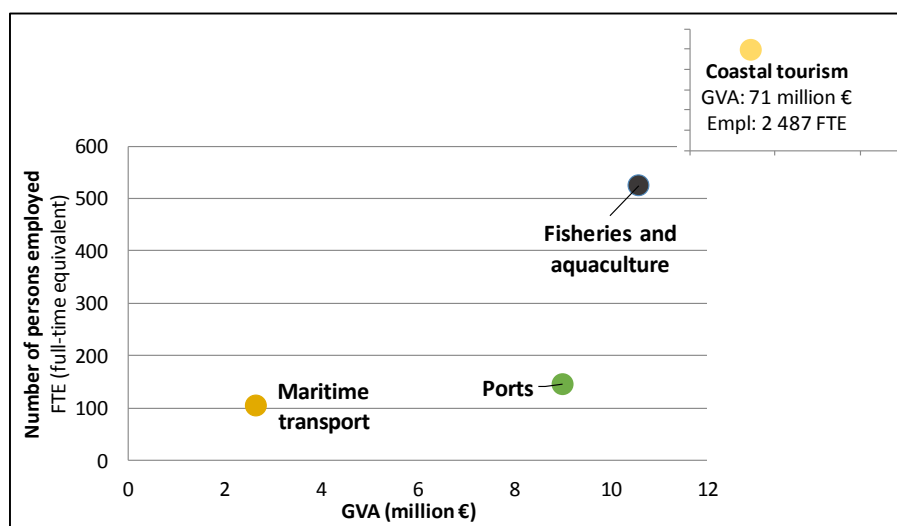


Source: our elaboration on INSEE data. 2013 data, except fisheries and aquaculture and tourism, both 2014.

Also in Martinique, the top four maritime activities having the highest socio-economic impact are fisheries and aquaculture, coastal tourism, maritime transport and ports. Ship repair activity plays a marginal role.

In this case too, cruise tourism presents a low value, since it does not include effects generated by the activity on satellite businesses.

Figure 6 – French Guiana maritime activities and socio-economic impact



Source: our elaboration of INSEE 2014 data for fisheries and aquaculture, 2013 data for maritime transport and ports, 2012 data for tourism.

Although it plays a marginal role in the overall economy and is less important than in other ORs, coastal tourism remains the most important blue activity in French Guiana, followed by fisheries and aquaculture, maritime transport and ports.

Table 4 – Saint-Martin maritime activities and socio-economic impact

Group	Sectors	Mature (m) vs pre-develop. (P) activity	Employment	Turnover (M€)
			2014	2014
Living resources	Fisheries and aquaculture	m	12 (declared)	2 (incl. Undeclared)
			≈ 80 active fishermen	
Non-living resources	Desalination	m	ss	ss
Shipping	Maritime transport and ports	m	100 to 150	10 to 15
	Ship repair	m	50 to 100	<5
Tourism	Coastal tourism	m	1 622	na

Sources: for fisheries and aquaculture, Development program for the fisheries industry in Saint-Martin, 2015 (CCISM); for maritime transport and ports and ship repair, estimates based on field interviews; for coastal tourism, Institut d’Emission des Départements d’Outre-mer, based on Union de Recouvrement des Cotisations de Sécurité Sociale et d’Allocations Familiales.

Data on GVA, employment and turnover were not available for this territory. For this reason, alternative information has been used for filling this gap. For more details on methods used, see chapter 1 of Annex 3.

Looking at future potential in terms of job opportunities and creation of value added, these activities (**coastal tourism, cruise tourism, shipping** — maritime transport and ports — and **fishing and aquaculture**) presented an important potential, considering that at present they

constitute the backbone of the local economies in all Caribbean-Amaozonia territories ⁽⁵⁰⁾. On the other hand, two activities at a pre-development stage presented a remarkable growth potential for the near future, and could create important job opportunities and value added for the sea basin economy, i.e. **renewable energy** and **blue biotechnology**.

1.1.3 Findings of the needs analysis and best practices survey

The purpose of this paragraph is to report, for the most important maritime activities identified, the main findings from the **analysis of synergies and conflicts** among maritime activities. Furthermore, the main results of the **gap analysis** for the most important maritime activities have also been reported at sea basin level and for each OR, classifying them as 'legislative', 'non-legislative' and 'financial'.

At the end of the paragraph, **key best practices and flagship projects** have been given for all activities, selecting them from the Annexes.

1.1.3.1 Fisheries and aquaculture

- **Main results from 'Synergies & conflicts' analysis**

The analysis of synergies and conflicts among maritime activities showed that both in the **Caribbean-Amaozonia** sea basin and in **each OR** (excluding French Guiana) the development of so-called 'pesca-tourism' ⁽⁵¹⁾ could create important synergies between the fisheries sector (but potentially also aquaculture) and coastal tourism.

With regard to **Martinique** and **Guadeloupe**, small-scale fishery activity has intrinsic synergies with coastal tourism, as the fishery sector has an important heritage value, and is an asset for the image of Martinique for tourism.

As regards conflicts, in the **Caribbean-Amaozonia** sea basin, conflicts between fisheries & aquaculture and other maritime activities have been identified for the use of space, both on the coast and at sea. Given the large number of activities taking place in the coastal area, obtaining concessions for aquaculture could be more complicated, and conflicts might emerge between aquaculture and tourism activities, particularly aquaculture. While such conflicts have been generally identified in the sea basin, in ORs these contrasts do not appear to exist, given the limited development of aquaculture. On the other hand, in **French Guiana**, there are potential conflicts between the fishery sector and oil extraction (and to a lesser extent maritime transport) ⁽⁵²⁾, due to the presence of seismic waves and wastes, depending on the areas selected for oil extraction (if oil extraction is authorised). This highlights the negative impact of oil extraction on marine resources.

- **Main results from the Gap analysis**

Looking at the **Caribbean-Amaozonia** sea basin, several **non-legislative gaps** have been identified. In terms of human resource skills, the lack of primary education constitutes a significant gap for sustainable fisheries and aquaculture, depriving the sector of entrepreneurial capacity to invest and diversify the activity and increase their incomes. For aquaculture, technical personnel with training in aquaculture, both at university and lower level, are lacking within the region. In terms of infrastructure, there is a lack of facilities for fishing. Another important gap identified is the lack of space for aquaculture projects in the Caribbean Islands. In fact, offshore aquaculture is complicated in hurricane-prone zones, and coastal areas are highly coveted or unsuitable for pollution reasons. Finally, further research on stock assessment and permanent programmes to monitor catches could be carried out in the area. Some researches are being carried out by the public sector, NGOs and the private sector currently involved in commercial aquaculture production, but they are deemed

⁽⁵⁰⁾ For more details on future potential, please see Annex 11, chap. 9.

⁽⁵¹⁾ Pescaturism consists of a trip on a fishing boat with local fishermen who take tourists on board. Tourists can take part in fishing operations, visit fishing villages along the shore, or eat freshly caught fish that is prepared on board.

⁽⁵²⁾ See details in Annex 4 — French Guiana. Permis d'exploration Guyane Maritime — Réalisation d'une campagne sismique 3D — Volume 1 — Résumé non technique du document d'appréciation des impacts environnementaux (DAIE) sismique — CREOCEAN for Shell, 2012.

insufficient for duly supporting efforts to study and monitor fishery resources. In this sector in particular, a wider use of public funds had been expected, but has not been forthcoming (**financial gap**).

In **Guadeloupe, non-legislative** gaps come in the form of human resource skills. For fisheries, training on on-board safety and on good practices for product marketing appears to be necessary. For aquaculture, training needs are not covered, and people may have to go to Martinique or mainland France for such needs. Another important gap identified is the 'age' of the fishing fleet. It needs to be renewed, improving safety on board and fuel efficiency, in order to enable fishermen to operate further from the coast in less exploited areas. There are also infrastructure gaps as regards landing sites in particular. The enhancement of knowledge on marine resources is also strongly needed to improve the management of the resource.

The modernisation of the fleet was also a gap in **Martinique**. Considering that no subsidies are envisaged for this purpose, the investment capacity of fishermen remains low, but the need to improve safety conditions on board remains high. **Non-legislative gaps** included the lack of education and entrepreneurial capacity among fishermen, and a lack of research in innovation for the small-scale fleet. The enhancement of knowledge on marine resources is also needed in Martinique to improve the management of the resource.

Education and training for fishermen was also limited in **Saint-Martin (non-legislative gap)**, and there is little interest in raising their skills, considering that the limited number of applicants does not warrant the staging of classes. Infrastructural gaps have also been identified, since there are no organised landing sites in Saint-Martin. As seen in other ORs in the area, the fleet needs to be modernised, especially in relation to safety and reduction of fuel consumption, making fisheries activities unsustainable. Finally, with regard to research, resources are not well known. There is a need for technical support to build up an observatory with continuous data on catches (from formal and 'informal' fishing activities) to enhance knowledge on marine resources and effectively manage the resource.

There were similar **non-legislative gaps** in **French Guiana**, namely a lack of education and training to fishermen (and limited interest in raising entrepreneurial capacities), lack of infrastructures for landing fish, lack of resources for modernising the fleet (especially small-scale fleet), and lack of knowledge about marine resources.

1.1.3.2 Coastal tourism

- **Main results from 'Synergies & conflicts' analysis**

Looking at **Caribbean-Azononia** at sea basin level, the development of coastal tourism is strongly linked to transportation and especially internal and inter-island transportation (air and maritime transport). On the other hand, the development of coastal tourism as well as ports infrastructures and services for facilitating transportation could generate conflicts with other maritime activities for the use of space, for instance with aquaculture, even if little developed.

In the different ORs, this type of conflict has not been identified, while synergies exist in **all ORs** between coastal tourism and maritime transport, and especially between tourism services and cruise tourism. When cruise tourists land in the Caribbean ORs they are looking for services offered by coastal tourism (restaurants, shopping, nautical services, beaches, etc.). As regards French Guiana, the limited development of both cruise and coastal tourism mean that significant synergies have not been identified.

- **Main results from the Gap analysis**

At sea basin level, the **Caribbean Amazonia** area reveals some **non-legislative** gaps in the coastal tourism sector that hinder the growth potential of this activity. The main gaps identified concern human resource skills and research.

In terms of human resources, there is a real need to develop human resource skills at all levels to build institutional capacity for adopting holistic development frameworks in the sector. Small and medium enterprises lack management skills, and need to be trained to improve their entrepreneurial capabilities. Links between the industry and the education and training systems have not been observed.

Limited research is carried out to (i) support the identification of alternative and more sustainable activities for enriching the tourism offer, and (ii) find ways to attract other groups of tourists (other than beach tourists) that can benefit a wider cross-section of society and provide a greater depth to the tourism product.

In greater detail, in **Guadeloupe**, specific training is essential (in the areas of communication, sales, yacht maintenance, boating, etc. for people already involved in the sector and for potential new employees) for the development of yachting activity (**non-legislative gap**), considering that this is an activity of coastal tourism having a remarkable growth potential, but at present very limited capacities are available for meeting increasing demand. From a **financial** point of view, access to the city centre is not effective, and requires investments for appropriate communication channels. Cruises tourists land in Pointe-à-Pitre but the attractiveness of the waterfront is not optimal, and needs financial resources to make improvements. Finally, investments are needed to improve services in the marinas (restaurants, bar, souvenir shops, etc.) and to enable hotels to achieve international standards.

In **Martinique**, a **legislative** gap reported by stakeholders is the competition with other non-EU territories, which pursue a duty-free policy to attract yacht cruising. From a **non-legislative** perspective, coastal tourism requires specific skills for hotel business, yachting, repairs, etc., and high skill profiles are not available in Martinique, leading employers to recruit personnel from metropolitan France for some positions, a fact highlighted by stakeholders, especially in the yachting sector.

Furthermore, in Martinique, a **financial** gap identified is the lack of investments in the accommodation sector in terms of number of hotels and compliance with standards expected by clients. An accommodation strategy should be defined by local authorities soon.

Non-legislative gaps have been identified in **Saint-Martin** relating to infrastructures. With a view to developing activities linked to yachts, port terminals should be restructured, creating a dock and increasing the draught (subject to the analysis of environmental impact). Furthermore, the waterfront in Marigot, as well as its tourism structures and services (restaurant, souvenir shops, etc.), need to be modernised in a sustainable way respecting local bio-diversity. The quality of accommodation on offer also needs to be improved.

In **French Guiana**, an overall lack of specific skills in the accommodation sector was observed (**non-legislative gap**), and **financial** investments for improving tourism infrastructures were very limited, although development plans have been adopted for improving infrastructures devoted to this activity.

1.1.3.3 Cruise tourism

- **Main results from 'Synergies & conflicts' analysis**

Synergies between coastal tourism and cruise tourism in the **Caribbean-Amazonia sea basin**, and especially in **ORs** are very much sought, since a better organisation of coastal tourism offer (restaurants, excursions, shops, nautical activities, etc.) could attract a higher number of stopovers from cruise ships. Better infrastructures for receiving yachts and mega yachts could also be used for receiving cruise vessels. The link with port activity is thus also very important. On the other hand, conflicts with maritime transport emerge during the cruise season, since priority for berthing is given to cruise ships, while cargo ships are forced to load and unload after cruise ships set sail. Such a conflict has been identified in non-EU territories, while in ORs no conflicts have been identified between cruise tourism and other activities.

- **Main results from the Gap analysis**

At **sea basin level**, the gap analysis reported several **non-legislative gaps** affecting cruise tourism. First of all, with regard to human resource skills, the availability of people skilled in cruise and coastal tourism is limited in some areas, especially in ORs (Guadeloupe, Martinique and Saint-Martin). Furthermore, port facilities in the Caribbean region are not always adequate to meet the growing average size of vessels. In addition, facilities and services are not always available in ports to facilitate the mobilisation of cruise ships loaded with thousands of tourists. As regards research, assessments on the economic impact of cruise tourism in the area are

lacking. These would be useful for undertaking appropriate measures for consolidating the sector in the area. At present, there is no common strategy in the basin regarding cruise tourism, but several organisations, e.g. CARICOM and Caribbean Tourism Organization (CTO) and Florida-Caribbean Cruise Association (FCCA) are active in the Caribbean region. Cooperation is increasing on this topic, and a CARICOM forum took place in 2015 on regional collaboration in the cruise sector.

Financial gaps were detected from the analysis of **Guadeloupe** cruise tourism. See gaps in 'coastal tourism' in § 1.1.3.2.

One main **non-legislative** gap was identified for **Martinique** that should be addressed in order to increase the impact of cruise shipping on the local economy: the lack of an organised tourism sector to welcome cruise tourists when they land in Martinique, in order to allow them to spend more money and expand economic benefits to local businesses.

The same **non-legislative** gap has been also identified in **Saint-Martin**. The offer of services (restaurants, souvenir shops, leisure attractions) and activities (touring, excursions, etc.) should be improved to increase the expenditures of cruisers on land. On the other hand, key infrastructural investments should be undertaken, since the cruise terminal needs to be restructured and adapted to the increasing demands of cruise vessels, while the Marigot waterfront should be redesigned, as it is a showcase for attracting new calls from ships.

In **French Guiana**, this sector is under development. However, there is a lack of infrastructure to welcome large cruise vessels, and lack of organisation of the sector to welcome tourists in Cayenne. These are key requirements for that should form the basis of any development plan for cruise tourism growth.

1.1.3.4 Shipping

- **Main results from 'Synergies & conflicts' analysis**

Ports are the heart of the blue economy, especially in insular areas. Synergies between ports and maritime transport, fishing and coastal tourism, but also ship repairs, are evident, since ports provide all possible infrastructure facilities to all these activities. These synergies, be they existing or potential, have been commonly observed in all **Caribbean** territories and in ORs as well. On the other hand, there may be conflicts in the port area, as in the Caribbean cargo ship traffic is disturbed by cruise ships. See § 1.1.3.3 for more details. Furthermore, there is a significant heterogeneity between ports in the region, with a lack of cooperation among them, even if regional strategies seek to establish a real ports network.

- **Main results from the Gap analysis**

The gap analysis revealed several **non-legislative** gaps in the **Caribbean-Amaozonia** sea basin. In terms of human resource skills, for some Caribbean ports, out-of-date labour practices still exist, resulting in inefficient and dangerous working conditions. The lack of training leads to equipment breakdowns, increasing port downtime. In terms of infrastructure, some ports (St. Vincent, Grenada and Antigua) have inefficient terminal designs, limited space for container traffic and outdated cargo pier structures. These characteristics result in substantial restrictions regarding operational efficiency and cargo capacity.

Another aspect of shipping activity in the area regards research on freight rates. The objective should be to understand how factors (i.e. distance between origin and destination of cargo flows, port infrastructure, connectivity impact, etc.) impact freight rates. In addition, studying the impact of network structure (proposed by the regional strategy that is not yet implemented) should be included in future research.

Furthermore, there is a gap on clearing and tracking cargo. Many Caribbean ports are limited in their use of information technology systems, resulting in a lot of paperwork and hampering efficient cargo clearing and tracking.

The education of skilled staff remains a key non-legislative gap in **Guadeloupe** and **Martinique**, but also in **Saint-Martin** and **French Guiana** for very specific skills: handicrafts (for ship repairs), maritime security and safety, cargo handling, ship planning, customs commissionaires, logistics management. Raising the educational level of personnel employed in

the shipping sector is needed to maximise huge investments undertaken in ports in Guadeloupe and Martinique.

As regards **French Guiana**, the Grand Port Maritime in French Guiana faces a specific issue of low draught, which limits the development of maritime transport in the OR. Continuous investments are needed to develop infrastructures and remain competitive at a regional level.

Infrastructural gaps have been observed in **Saint-Martin**. The cruise port needs to be restricted for security reasons. A dock should be created for cruise ships, and the commercial port should be extended, as areas available are limited, while draughts should be increased (after an analysis of environmental impact) to permit the reception of mega-yachts.

1.1.3.5 Marine renewable energies

- **Main results from 'Synergies & conflicts' analysis**

Possible conflicts for sea space could emerge between the development of offshore sites for the production of energy with other offshore activities, including fisheries and aquaculture, seabed mining and gas and oil extraction. The selection of areas for the development of wind energy could lead to potential conflicts depending, for instance, on the fishing activity and aquaculture projects in this area. However, the identification of potential conflicts is premature in light of the current phase of development of wind energy in ORs.

- **Main results from the Gap analysis**

The gap analysis revealed that capacity-building efforts should focus on identifying opportunities for mutually beneficial partnerships for renewable energy and energy efficiency, with the simplification of the regulatory system and promotion of R&D for sustainable energy solutions region-wide. Important cooperation gaps emerged, as the duplication of efforts is often a threat for the concrete development of these initiatives. A lack of coordination means that capacity is often wasted, and knowledge gaps persist. More feasibility studies should be conducted, learning from previous experiences and optimising efforts for future investments.

These gaps have been identified both at sea basin level and at OR level.

1.1.3.6 Blue biotechnology

- **Main results from 'Synergies & conflicts' analysis**

Synergies between blue biotechnology and fisheries and aquaculture activities are very strong, particularly as regards seaweed farming. Blue biotechnology might have a positive impact on coastal tourism through seaweed harvesting from beaches and their valorisation, since it contributes to clean beaches for tourists. Such action has been initiated in Guadeloupe and Martinique. These synergies will depend on the outputs from present research for the valorisation of seaweeds (compost, agricultural uses for producing fertilisers, bioplastic, etc.). For seagrass culture, there is a possible conflict in terms of space use with other activities.

- **Main results from the Gap analysis**

In terms of human resource skills, stakeholders involved in blue biotechnology are from Universities, Research institutes and private companies in Martinique and Guadeloupe. An industrial development of blue biotechnology would require the training of other stakeholders across the region. This could be an opportunity to exchange best practices and data. Further research is needed for the valorisation of bio-resources, for instance the valorisation of *sargassum*. This should not be considered as a gap, taking into account that the activity is still at a pre-development stage.

1.1.3.7 Main best practices and flagship projects surveyed

In this paragraph, main best practices and flagship projects surveyed in each OR and at sea basin level are reported. More details are available in chapter 3 of Annexes 1, 2, 3, 4 and 10.

1. **ORs concerned:** French Guyana.

Name of practice: Development of Odyssey project for blue tourism.

Objectives: (i) Development of French Guiana as flagship destination for tourism, notably maritime tourism. (ii) Better connection between coast and hinterland; (iii) involvement in Odyssey scheme

Maritime activities concerned: Coastal tourism and Cruise tourism.

Results achieved: a feasibility study has been completed. This project paves the way for the development of Blue tourism in French Guiana. It involves many partners active in the field of tourism.

Reasons for considering it as best practice or flagship project: the involvement in Odyssey allows:

- continuous collaboration with project partners, aimed at creating a cluster of growth and identification of investments and projects for blue tourism;
- the highlighting of tourism assets in French Guiana and potential for economic development;
- an innovative marketing approach, by defining and promoting identified local destinations;
- an innovative approach to coastal tourism and yachting: structuring a cultural and economic itinerary from the port to the town, characterised by a high level of services for visitors;
- a greater integration of the coast and the hinterland;
- networking between all areas involved in the Odyssey scheme;
- transferability of the approach to other territories.

2. **ORs concerned:** Martinique.

Name of the project: Development of Odyssey project for blue tourism.

Objectives: Development of Blue Tourism.

Maritime activities concerned: Coastal tourism and Ports.

Results achieved: Espace Sud Martinique applied to 'Odyssey'. This project aims to implement an integrated and sustainable development strategy for blue tourism.

Reasons for considering it as best flagship project: the involvement in Odyssey allows:

- an innovative approach to coastal tourism and yachting: it is a participatory and integrated approach, identifying priorities for intervention set out in a long-term action plan, with different possible public funding sources;
- the implementation of sustainable tourism: creating jobs for youth, improving local companies' competitiveness and structuring an economic model for the destination;
- the promotion of tourism as a major sector for the development of the 'Espace Sud': the project highlights the important role of tourism as a strategic catalyst for economic growth in the territories. It highlights tourism assets in Martinique and potential for economic development;
- a greater integration of the coast and the hinterland: structuring a cultural and economic itinerary from the port to the town, characterised by a high level of services for visitors;
- collaboration between stakeholders: better coordination between public and private actors, in particular tourism offices, associations and all the municipalities of 'Espace Sud';
- networking between all areas involved in the scheme: other Caribbean territories are partners in the project, in order to implement ambitious joint actions (preliminary meetings are being held in 2017);
- transferability of the approach to other territories.

3. **ORs concerned:** Guadeloupe.
Name of the project or practice: Feasibility study on a SWAC (Sea Water Air Conditioning) system for the hospital of Basse-Terre.
Objectives: Production of cold air from fresh deep-sea waters.
Maritime activities concerned: Renewable energy.
Results achieved: Development of new energy sources to reduce the consumption of fossil energies linked to air conditioning.
Reasons for considering it as best practice or flagship project: As the electricity network is under stress, Seawater Air Conditioning would allow an 80-90 % reduction in the energy bill connected to air conditioning, and thus satisfy hospital needs. Positive features of this project can be perceived at environmental, technical and governance levels, considering:
 - the global context of the island and the specificities of each site;
 - compatibility with local maritime capabilities;
 - the use of local resources and taskforces;
 - a reduced impact on the coastline, with directional drilling technology for shore crossing;
 - dialogue with local authorities (city hall, marina) for possible construction sites;
 - cost efficiency: large energy savings, costs are nearly independent of future energy price increases, no evaporative water consumption;
 - replicability on overseas islands.

4. **ORs concerned:** Guadeloupe.
Name of the project or practice: Study of the potential of a floating wind farm.
Objectives: A feasibility study for developing a marine Energy sector, notably through the establishment of floating offshore wind farms.
Maritime activities concerned: Renewable energy.
Results achieved: The feasibility study has resulted in the identification of one potential site.
Reasons for considering it as best practice or flagship project: This project is considered as a flagship project because the study has taken into account several aspects, namely:
 - implementation conditions and environmental specificities of the region;
 - critical review of floating offshore wind systems;
 - technical and economic evaluation of such a project and possible public funding;
 - in this case, a global approach considering various economic, financial and environmental aspects would be considered as a good practice to follow.

5. **ORs concerned:** Guadeloupe.
Name of the project or practice: Seaweed culture.
Objectives: Development of a production site of 1 ha. Valorisation of sea weeds for cosmetics.
Maritime activities concerned: Blue biotechnology.
Results achieved: This project is focused on the development of production targeted at high value markets.
Reasons for considering it as best practice or flagship project:
The final product of this project consists of high value-added products, particularly cosmetic products. Further development is expected as maritime concession of 1 ha is under discussion between the operator and the authorities. The project is replicable in other territories where concessions for sea weed culture can be provided.

6. **ORs concerned:** Saint-Martin.
Name of the project or practice: Forum des Métiers de la Mer.
Objectives: Promotion of careers in maritime activities.
Maritime activities concerned: All.
Results achieved: These actions are aimed at developing the attractiveness of sea activities and careers for young people.

Reasons for considering it as best practice or flagship project: The particularity of this forum is that it targeted young people. The objective was to inform them about the employment opportunities that the sea offers, enabling a reflection for their future career choices. This approach is essential to complete other approaches that seek to develop sea-related employment opportunities.

7. **ORs concerned:** Caribbean-Amaozonia sea basin.

Name of the project or practice: Caribbean Large Marine Ecosystem Project (CLME).

Objectives: The overall objective is to help participating countries to improve the sustainable management of their shared living resources through an ecosystem-based management approach. In particular, the CLME Project aims to: i) identify, analyse and agree on major issues, root causes and actions; ii) improve shared knowledge; iii) implement legal, political and institutional reforms; and iv) develop an institutional and procedural approach to LME level monitoring, evaluation and reporting.

Maritime activities concerned: Fisheries and aquaculture.

Results achieved: The main product of the project was the development of a strategic action programme for sustainable management, a shared vision of the countries participating in the Project regarding the priority interventions, reforms and investments required to ensure the sustainable provision of goods and services from marine resources.

Reasons for considering it as best practice or flagship project: The project is considered as a flagship project as it rests on three essential pillars:

- **Cooperation:** the project includes many stakeholders: governments, regional organisations (CARICOM, CRFM, Organization of Eastern Caribbean States, etc.) and international organisations (International Commission for the Conservation of Atlantic Tunas 'ICCAT', Western Central Atlantic Fishery Commission, etc.).
- **Scientific base:** the main achievement of the project is the elaboration of a programme of interventions based on scientific works carried out within the framework of the project. Data relating to fisheries, biology, pollution and socio-economy were gathered and formed the scientific basis for the elaboration of the programme of actions.
- **Prospects:** regular monitoring and evaluation of progress towards the achievement of the CLME goals and objectives has been developed.

8. **ORs concerned:** Caribbean-Amaozonia sea basin.

Name of the project or practice: St. Lucia Heritage Tourism Programme.

Objectives: The Programme's mission is to establish heritage tourism as a viable and sustainable component of St. Lucia's tourism products by facilitating a process of education, capacity building, product development, marketing, credit access and the promotion of environmental and cultural protection for the benefit of host communities and St. Lucians.

Maritime activities concerned: coastal tourism.

Results achieved: The main achievements of the programme can be summarised as follows:

- providing technical and financial support to various projects and initiatives;
- developing and disseminating a marketing brand for heritage tours (including marketing arrangements);
- providing capacity building to partners, associations and relevant stakeholders involved in natural and cultural heritage sectors;
- awareness-building and communication for promoting heritage tourism;
- conducting policy studies and providing recommendations.

Reasons for considering it as best practice or flagship project: Beyond the project's achievements adapted to the case of Saint Lucia, the project provides a set of best practices to implement the strategy in other territories, namely:

- **Government involvement:** National-level initiatives in favour of pro-poor tourism need to be guided by a clear vision and clear objectives. In this context, national initiatives depend on the leadership provided by governments. While many interventions and actions can be undertaken by organisations, communities and the

private sector, the programme shows that they cannot be effective without the strong involvement of government.

- **Interdisciplinary approach:** Pro-poor tourism actions must benefit from specific skills, and a good knowledge of the sector among those who lead and implement the action.
- **Good understanding of social capital:** Pro-poor tourism initiatives must be based on a good understanding of the social capital of the host society, and must be able to identify the elements of that capital that have significant potential in the development of policies, actions or programmes.

1.1.4 Findings concerning most relevant growth drivers and barriers

In this paragraph, the main findings of the analysis on 'Growth drivers and barriers' for the most important maritime activities are reported, classifying them as 'legislative', 'non-legislative' and 'financial'.

1.1.4.1 Fisheries and aquaculture

From a **legislative** point of view, in the **Caribbean-Amazonia sea basin**, the Food and Agriculture Organisation (FAO) global blue growth initiative may represent a significant growth driver for building capacity and exchanging best practices on aquaculture. This initiative aims to support the CARICOM countries with the responsible development of aquaculture, building on lessons learned from other regions, technology transfer and simultaneous assistance. Caribbean countries have made important commitments regarding regional conventions and agreements to sustainably manage fisheries and develop aquaculture.

On the other hand, there is an overall lack of governance in the fishery sector in the area, since many countries in the region have not formally adopted fishery management plans, not even for the main targeted fish species. Furthermore, although the FAO initiative is operating in this context, at a regional level there is an absence of adequate mechanisms for exchanging aquaculture information in the Caribbean, while at a national level limited attention is paid to devising a legal framework for aquaculture development.

A **financial** barrier to the growth of the fisheries and aquaculture sectors in the sea basin is the overall lack of funds. For aquaculture, it is difficult to access credit. The fisheries sector is not attractive for investors or banks, which are not interested in funding fleet renewals or other types of modernisation. In several areas, financial resources for carrying out researches in many fields (support for diversification of fishery activity, monitoring resources, etc.) are not available.

The **Guadeloupe** fishery sector presents important legislative and non-legislative growth drivers that could support the development of the sector. From a **legislative** point of view, the commitment of local authorities to develop local fisheries and aquaculture production in order to reduce dependence on imports is a key driver, since it might ensure long-term support for more structural and concrete developments. This commitment, especially in aquaculture, could help to overcome regulatory constraints that hinder the development of aquaculture. Furthermore, the delay in the implementation of the EMFF and the fact that fleet renewal is not covered by the Common Fishery Policy (CFP) are two barriers that might limit the growth of the sector in the short term, considering the financial difficulty of fishermen (and potential farmers) in accessing credit. Fishery and aquaculture sectors suffer from weak attractiveness for banks. Some pilot projects are ongoing for developing more efficient and safer fishing boats. Synergies with pesca-tourism could generate further income for fishermen, but these efforts are not enough to offset the need for updating the fleet, especially considering the new requirements needed for hosting tourism on board (should these vessels operate in the tourism sector).

In this regard, one of the main **non-legislative** barriers hindering the diversification of fishing activities towards tourism is represented by the low level of education of fishermen, who do not possess the entrepreneurial ability to diversify or even to deal with activities other than their traditional jobs. The availability of training opportunities to enable fishermen to diversify their activities (pesca-tourism) could help to overcome this barrier.

Finally, with regard to fisheries, the need to have more infrastructures generates conflict with dredging works in the port area. Furthermore, some fisheries areas are no-go areas in relation to past agricultural activities (chloredecone contamination). Similar problems on the use of space have been identified for aquaculture, and the activity is in conflict with areas dedicated to protected marine areas.

In **Martinique**, **non-legislative** growth drivers for the fishery sector are the availability of diversification possibilities to fishermen within coastal tourism (pesca-tourism) and the availability of courses solely for this purpose. On the other hand, several barriers to growth have been identified hindering the development of fisheries and aquaculture from a legislative, non-legislative and financial point of view. A key **legislative barrier** is the lack of subsidies through the CFP for renewing the fishing fleet, which is further constrained by the difficulty of fishermen and farmers to access funding (**financial barrier**).

Saint-Martin also presents remarkable **legislative growth drivers**, as public commitment to the development of the sector is high⁽⁵³⁾. Local authorities are also engaged in the establishment of cooperation with Anguilla and Sint Maarten (for exploring possible new fishing areas and reducing competition with local fishermen), and are committed to developing local production in order to reduce imports. **Non-legislative** drivers can be identified in the training opportunities that might enable fishermen to diversify their activities (pesca-tourism). However, this driver is counterbalanced by an overall lack of human resource skills, as fishermen generally have a low level of education, and do not have the inclination to diversify their activity. In general, in Saint-Martin, there is a lack of technical knowledge for developing the fishery sector and improving production. Illegal fishing is a strong barrier, which affects the creation of robust and sustainable internal supply. Finally, with regard to **financial** resources, the fishery sector lacks resources, considering that fleet renewal cannot be sustained by the EMFF, and fishermen do not have access to credit.

French Guiana presents similar **financial** constraints, since fleet renewal cannot be undertaken through the EMFF, and fishermen have no access to finance, and have a low investment capacity. The lack of infrastructure (landing ports, sales points, processing, marketing, etc.) and R&D are also critical factors for the development of small-scale fleet. **Non-legislative** barriers are represented by the low level of education of fishermen, having little interest in renewing production methods or diversifying the sources of their income. On the other hand, the possible development of a processing industry in French Guiana could represent a driver for the development of the fishery sector, also considering that the processing sector is able to position its production in Metropolitan France, the Caribbean and South America. Illegal fishing is also a specific issue in French Guiana's waters, limiting the competitiveness of the sector and the sustainability of the activity.

1.1.4.2 Coastal tourism

At sea basin level, from a **legislative point** of view the Caribbean Sustainable Tourism Policy Framework, which is developed by the CTO to provide its members with guidelines for the sustainable development of tourism, is an opportunity for further developing tourism and cooperation within the region⁽⁵⁴⁾. Certainly, more efforts could be made to develop synergies among territories and establish common policies for strengthening the sector in a sustainable manner. The adoption of ecotourism models, for instance, could limit the impact of mass tourism on the environment, allowing the region to adopt environmental protection frameworks. At sea basin level, one of the most relevant **non-legislative** barriers to growth is the lack of training programmes to make tourism be considered as a resource rather than a threat to local communities.

In **Guadeloupe** tourism can depend on good levels of transport infrastructures, especially air transport, since new international air routes have recently opened. On the other hand, marina services are insufficient, and there is an overall perception of insecurity in these areas.

⁽⁵³⁾ An analysis of the sector has been carried out and development actions have been identified, among which the restructuring of the fisheries sector is one of the key objectives on the island.

⁽⁵⁴⁾ The different level of taxes applied in the different territories for tourists hinders the homogeneous development of the sector.

Furthermore, hotel offers have declined due to the disengagement of hotel groups. This fact could significantly hamper the potential of Guadeloupe to attract foreign direct investments (FDI) in this sector and raise accommodation standards.

Finally, from a **financial** point of view, resources dedicated to the promotion of Guadeloupe as a tourist destination have declined, and the lack of continuous promotional campaigns worldwide might hinder the development of the sector in the future.

One of the main potential **non-legislative** resources not exploited in **Martinique** is the lack of synergies between cruise and coastal tourism. This situation generates a lack of services (on the coastal tourism side) on offer to cruisers, from excursions to nightlife. On the other hand, the availability of important infrastructures such as airport and hotels represents a useful asset for ensuring new tourists' flows in Martinique. Infrastructure and administrative procedures are key factors for the investment of foreign firms in tourism ⁽⁵⁵⁾.

In **Saint-Martin**, a **legislative** growth driver could be the adoption of the regional scheme for the development and planning of tourism activities, adopted for the period 2013-2020. Furthermore, the restructuring project for the cruise port is being examined. It aims to create the conditions to be able to receive mega yachts (increasing draught, development of onshore infrastructures). A diagnosis of the yachting sector has been launched by local administrations which could generate further benefits to the local economy. One of the main barriers to growth is the fact that the supply of hotels has declined in recent years due to the disengagement of hotel groups. Furthermore, the quality of hotels, on average, is not up to international standards. Furthermore, security in marinas is not very high, and needs to be improved. From a **financial** point of view, there is limited public financial capacity to support all the emerging needs (regarding infrastructure particularly). Local authorities are attempting to involve private operators in the modernisation of the cruise terminal. This could attract private investments to the island, and contribute to the development of the yachting sector.

In **French Guiana**, there are large tourism infrastructures (airports, hotels, etc.) which could act as drivers for tourism development. An abundant workforce is available, even if the skills are not adequate for meeting international tourism standards. The main barrier to growth for the sector in the OR is the lack of tourism flows: the availability of public financial support and interest in developing the sector could help to raise the attractiveness of French Guiana and to structure an adequate offer.

1.1.4.3 Cruise tourism

The main growth driver of the sector in the **Caribbean-Amazonia** sea basin and in **each OR** is related to the public involvement for improving ports' infrastructure and the diversified attractions on land or in coastal areas would indeed consolidate the role of cruise tourism in local economies and help to generate further flows and demand from cruise lines.

Looking at **ORs**, growth drivers were missing or not adequately developed. Infrastructures in ports for hosting large cruise ships are not available (excepted for Martinique), tourism offer on land is limited, waterfronts are not very attractive (e.g. Pointe-à-Pitre in Guadeloupe and Marigot in Saint-Martin).

Further efforts should be also made to enhance the security image in marinas (Guadeloupe, Saint-Martin and French Guiana), safety being a dimension of the territory attractiveness for tourists.

1.1.4.4 Shipping

Shipping in the **Caribbean-Amazonia** sea basin could be boosted significantly by a **legislative driver**, namely the CARICOM strategic plan for maritime transport services. The development of tourism activity could generate higher demand for goods (**non-legislative driver**) in the Caribbean, and maritime transport should be equipped for meeting these increasing needs. This could also imply a better organisation of transportation models at sea

⁽⁵⁵⁾ Benchmarking the FDI Environment in the Caribbean
<https://openknowledge.worldbank.org/bitstream/handle/10986/25061/Demystifying0t0the0Caribbean0Region.pdf?sequence=4>.

basin level, in order to avoid conflicts between ports, improve efficiency and reduce transport costs. One of the main **barriers to growth** at sea basin level is the lack of a skilled labour force (shipping logistics and management) in most Caribbean countries. Regarding passenger transport, competition between operators exists in particular in the area of air transportation, which could impact on the competitiveness of the activity and hamper the developments recently made by passenger transport. An important **financial barrier** has been identified: public funds are the only source of funding, and are usually not sufficient to cover required investments for port management and their improvement.

Financial limits to support investments in ports have been also identified in **Saint-Martin**. Large investments are required for the restructuring of port infrastructures (draught increase, increase of quay length, etc.), but public financial capacity is limited. The involvement of private operators in these investments (through changes to the port management system) is pursued by local authorities.

The same financial barrier has not been identified in **Guadeloupe** and **Martinique**. In fact, important infrastructure investments have been made recently in port development, although the origin of these funds is public (European Regional Development Fund — ERDF, Conseil Régional, French State). An important driver to growth in these ORs for shipping is therefore public commitment, which has been behind important developments. The lack of qualified resources, however, limits the potential of this activity, and makes it impossible to optimise investments in ports.

Important public commitment has been seen also in **French Guiana** regarding the development of port infrastructures. Possible development projects identified are ambitious (i.e. offshore platform).

1.1.4.5 Marine renewable energies

The main driver for the development of blue renewable energies in the **Caribbean-Amazonia** sea basin is strong national and regional commitment, through the regional energy policy (adopted in 2013) and related national action plans. CARICOM member states are currently taking steps to advance pilot projects for ocean thermal energy conversion. **Non-legislative** and **financial barriers** however limit the development of the sector. Technologies currently remain in early development stages, and there is no infrastructure in place. Furthermore, technology costs are very high. Identified initiatives within the regional roadmap framework entail major investments that have exceeded the financing capabilities of most electric utilities in the region. National action plans for sustainable energy have not identified potential sources of financing for the implementation of renewable energy initiatives.

The same drivers and barriers have also been identified in ORs, where some projects have been carried out, but the financial investments for technological development remain high.

1.1.4.6 Blue biotechnologies

The main driver (**financial**) that could support the development of the sector is the availability of funding, also originating from private investors. Major investments are needed, and may be obtained by creating the most appropriate environment to attract them and develop the activity. The most relevant barrier to growth (**non-legislative**) is at present limited research capabilities, and the fact that specialist and more qualified training is not available locally.

1.1.5 Findings on activities with highest potential

In this paragraph, the main findings of the analysis about the potential of the main maritime activities identified are reported at sea basin level, assessing for each activity its potential in terms of value added, employment and competitiveness. The detailed analysis is given in chapter 9 of Annexes 1, 2, 3, 4 for each OR and annex 10 for the Caribbean-Amazonia sea basin as a whole.

1.1.5.1 Fisheries and aquaculture

Looking at the sector at sea basin level, the **Caribbean-Amazonia** aquaculture sector presents remarkable growth potential in terms of job creation and added value. The FAO suggests that with a good governance and real public commitment, aquaculture production has

the potential to grow by 30 % by 2025, equivalent to a rate of 3 % annually in the Caribbean region. Most of the future expansion in aquaculture production capacity will probably occur in the ocean, with some of it increasingly moving off-shore to escape the constraints of coastal waters. With regard to the fisheries sector, development would consist of more sustainable activity following an ecosystem-based management approach led by regional governance. The development of tourism could offer an opportunity to valorise fishery production. The potential for increasing the competitiveness of both sectors originates from (i) opportunities to train local human resources to acquire required skills (covered by CCFP) and (ii) collaboration between regional and international fisheries bodies to establish regional research priorities. Local products could also be competitive in international markets, through premium prices set for some Caribbean products in the international market (shrimp, spiny lobster, tuna, etc.). However, a challenge for the positioning of Caribbean aquaculture products on the international market is represented by competition with Asia and South America, where large-scale production and cheap labour costs have reduced overall production costs and product prices. Furthermore, the exporting of aquaculture products to some countries, the United States for instance, requires the farm to meet specific quality standards. Meeting some of these standards can be extremely difficult for some of the Caribbean territories, as they pose financial, policy and institutional challenges, as experienced by Saint Vincent and the Grenadines (with the EU). With regard to ORs, this activity remains at a limited stage, and local demand could be the first market for most aquaculture products.

As regards **Guadeloupe**, the challenge of the fishery sector is to preserve fisheries resources and maintain the current level of employment, while improving the value added of the sector (by decreasing costs and improving the value of products). For aquaculture, the potential for employment will be proportional to the increase in production capacity. Nevertheless, it will remain limited, as constraints are still in place as regards new concessions. Fishery activities face challenges regarding generation renewal, due to the difficulty for young people to access credit and buy boats. More qualified human resources are needed and opportunities for education are lacking. There is no liaison between training systems and the industry. Both sectors lack research capabilities, and depend heavily on public funding.

In **Martinique**, the potential in terms of employment growth remains limited for both fisheries and aquaculture. In the fishery sector, an increase in landed volumes is unlikely (due to pressure on resources), which limits the potential for an increase in the number of jobs. There is growth potential for value added generated by the fishery sector through a better organisation of the supply chain and the valorisation of local sea products. Product competitiveness could be enhanced by improving safety, hygiene and quality, but the overall lack of infrastructures hampers the fulfilment of this potential. Investments on board could improve safety and working conditions. This is important for increasing the attractiveness of the sector for new fishermen and employees. Investments both on board (ice, gears) and on landing sites (storage, processing, counters for direct sales) could increase the quality of products and have an impact on sale value.

As regards **French Guiana**, there is no potential for growth in the fishery sector in the present context: stagnation of fish prices, low investment capabilities, lack of infrastructure, and limited resources for assessing the employment potential in aquaculture. Fishery products are mainly sold on the local market. An important factor that could support the competitiveness of the sector is the processing industry. Exporting these products (e.g. shrimps) out of French Guiana and supporting their positioning in international markets could be of considerable benefit to local industry.

There is a potential for development of the fisheries sector in **Saint-Martin**, and thus a potential for job creation, although limited in absolute terms. Challenges regarding the regularisation of the illegal activities and generation renewal have to be tackled. The potential for competitiveness of the fishery sector is based on tackling challenges related to informal activities (unreported), generation renewal, training of new people, and improvement of infrastructures. Furthermore, growth in the sector should focus on the objective of reducing dependency on imports.

1.1.5.2 Coastal tourism

In the **Caribbean-Amazonia** sea basin, the coastal tourism sector has a remarkable growth potential. By 2025, the annual real growth in tourism's total contribution to GDP is projected at 3.3 % for the Caribbean region (excluding mainland countries), and 4.5 % including mainland countries. Of particular relevance for the Caribbean, the GVA from ocean-based tourism is expected to more than double during this period, adding an additional US\$ 405 billion ⁽⁵⁶⁾.

The sector employs a significant number of people. However, the potential in terms of job creation remains high, if the following needs are met:

- Shift away from a form of tourism that threatens the environment and disturbs the local community. The possible adaptation of a pro-poor tourism policy would emphasise environmental conservation and community-based tourism that seeks to increase people's involvement in tourism and create job opportunities.
- More dialogue between private and public sector should be fostered, agreeing on a common strategy for a more sustainable tourism sector.
- Training at various levels should be provided, from policy makers to managers and employees.

Coastal tourism potential is linked to the capacity of the territories to attract FDI. Several countries have stepped up their efforts to review regulations in the tourism sector in order to attract FDI, mainly in hotels and restaurants (Antigua and Barbuda, Barbados, St. Lucia, Grenada and Suriname). Infrastructure and administrative procedures are the most important factors that determine the level of attractiveness of a sector for foreign investors ⁽⁵⁷⁾. From this point of view, for foreign investments taxation and customs are burdensome in more or less all territories. A mechanism for reducing these costs needs to be planned.

Coastal tourism could effectively represent the driving force for the improvement of local economies, also in connection with other maritime activities that might benefit from the competitive advantages of the Caribbean's attractiveness. On the other hand, the development of coastal tourism requires investments for increasing the level of services provided and meeting growing demand from tourists.

Looking at ORs, the main challenge for **Guadeloupe** is the development of a new customer base (in particular American customers), and for it to become a more attractive destination among Caribbean islands. This implies developing new products (new activities, modernisation of the hotel offer and compliance with international standards, etc.) and reinforcing the attractiveness (i.e. waterfront) of Pointe-à-Pitre. However, the lack of qualifications of employees remains a challenge for the sector (with the need for qualified yachting personnel and higher accommodation and catering skills).

The limited availability of qualified human resources has been identified as a challenge also in **Martinique**, in the different branches of tourism (yachting and accommodation), even if there is a local educational scheme (hotel & accommodation school in Bellefontaine city). The tourism sector in Martinique does however have a remarkable potential for proposing a competitive tourism offer. The island has strong assets at an international level, such as its image, infrastructures, beaches, safety for tourists, which are key elements to be promoted for improving the sector and attracting new investments.

In **Saint-Martin**, the potential of coastal tourism could be exploited if some key improvements are implemented, such as: (i) life-long training and professionalisation of personnel (especially in the sphere of accommodation); (ii) development of adequate infrastructures in ports (docks) and modernisation of marinas; (iii) improvement of the quality of hotel offer and services; (iv) modernisation of roads.

⁽⁵⁶⁾ Toward a blue Economy: A promise for Sustainable Growth in the Caribbean, <https://openknowledge.worldbank.org/bitstream/handle/10986/25061/Demystifying0t0the0Caribbean0Region.pdf?sequence=4>.

⁽⁵⁷⁾ Benchmarking the FDI Environment in the Caribbean. <https://openknowledge.worldbank.org/bitstream/handle/10986/25061/Demystifying0t0the0Caribbean0Region.pdf?sequence=4>.

The island has a lot of assets (image of authenticity, good conditions for yachting, French food and wine and well-preserved natural sites), but suffers from competition from the Dutch side, which has massively invested in the development of cruise tourism and related activities (hotels, shops, casinos, etc.) in order to become an attractive destination for North American customers. On the other hand, Saint-Martin has a remarkable potential for increasing its attractiveness in yachting activities, considering that a larger number of berths are available compared to the Dutch side (750 vs 400).

Although currently very limited, coastal tourism in **French Guiana** has a good growth potential. Based on the regional strategy for tourism, 7 500 jobs are expected to be created by 2024 from tourism. To achieve this objective, French Guiana should improve its position in the international market and may rely on the important flow of passengers visiting French Guiana for business purpose (for instance Kourou Space Centre). There is a need for basic education for the people involved in coastal tourism: entrepreneurship, language skills, specific technical skills (security, cooking, hotel services, etc.). There is a specific educational scheme in the accommodation industry in French Guiana, however the education of stakeholders (hotel, restaurants, etc.) would increase the resilience of the sector. Infrastructural projects are planned for blue tourism (Odyssea project) and for the development of tourism activities connected with the Amazonian forest.

1.1.5.3 Cruise tourism

For the **Caribbean sea basin**, cruise tourism is one of the market segments that has experienced the highest growth in recent years. The development of activity depends on the ability of ports to keep up with increasing vessel sizes and provide needed services. These are key investments to be undertaken for increasing the sector's competitiveness and generating new job opportunities in all economies of the area. Obviously, different strategies may be implemented in the ORs. **Guadeloupe** for instance needs to diversify the type of tourist customers, concentrating for instance on North America and not only Europe. Higher added value and employment rates could be generated by activity in **Martinique** if the island becomes a start- and end-point of cruises. As regards **Saint-Martin** and **French Guiana**, the lack of infrastructural facilities for hosting cruise vessels hinders the potential of cruise tourism in these ORs. French Guiana has the disadvantage of its geographic position, but the identification of small local cruise routes (i.e. micro-cruises) close to the coast or in the Amazonian rivers could be an important activity to be exploited in the future. Saint-Martin suffers from the competition of the Dutch part of the island, better equipped in terms of infrastructures and with huge flows of cruisers every year. For this reason, in Saint-Martin, there is a potential for attracting mega-yachts and medium-size cruise boats, as these targets are currently not covered by the island, but infrastructures need to be improved.

1.1.5.4 Shipping

The development of freight transport at **sea basin level** is expected to grow in connection with the expansion of the Panama Canal. Port infrastructures need to be improved in some territories to welcome larger vessels and to meet trade expansion. Its potential in terms of employment is high, and would require high and low skill profiles. Passenger transport is one of the fastest growing sectors in the region, and continues to contribute considerably to the local economy of Caribbean countries in general.

The potential competitiveness of the activity could be linked to the development of a customs union and the free circulation of goods within the Organisation of Eastern Caribbean Economic States ⁽⁵⁸⁾, which may provide the catalyst for the provision of enhanced local shipping services, driving the development of more services and reducing transportation costs. Moreover, a strategic plan for maritime transport services for the CARICOM single market and economy is under development, seeking to examine the Caribbean shipping industry from three perspectives: i) efficiency and adequacy of the maritime transport service and

⁽⁵⁸⁾ Inter-governmental organisation whose aims are to support the economic integration of countries in the Eastern Caribbean, support the protection of human and legal rights, and encourage good governance between countries.

infrastructure; ii) opportunities for employment for Caribbean nationals; and iii) state of environmental machinery to protect the Caribbean sea basin ⁽⁵⁹⁾.

As regards freight transport in **Guadeloupe** and **Martinique**, the potential of this activity is linked to the opening of the new locks in the Panama channel. According to stakeholders, this should constitute an opportunity in terms of employment in the region. In Guadeloupe, Port authorities estimate that the development of port infrastructures could create around 500 jobs, of which 200 would be direct jobs. Direct jobs are linked to the following categories: transit of goods (25 % of direct jobs in 2010) ⁽⁶⁰⁾, port handling (20 %) and storage (9 %). These categories include both qualified and non-qualified positions. General training in the logistics field exists locally, but is not specific to port activities.

In **Saint-Martin**, the development of freight transport is mainly linked to the capacity of the port to improve its positioning in the regional market, particularly with respect to Sint Maarten. The competitiveness of the sector could be boosted by raising human resource skills and reinforcing the port's attractiveness by increasing its capacity. Feasibility and regulatory studies are being carried out for the extension of the port, but EU, national and local support is needed for undertaking these developments. The potential in terms of job creation refers to a large range of jobs, some with low skills and other requiring a higher educational level.

As regards **French Guiana**, there is a growth potential for both employment and value added due to several projects, namely the short-sea shipping project between western and eastern French Guiana, a new maritime port in the western part of French Guiana and the project for a multipurpose offshore platform. The competitiveness of French Guiana at an international level is hampered by the low draught in Grand Port Maritime. This issue may be resolved by the proposed multipurpose offshore platform.

1.1.5.5 Marine renewable energies

Within the framework of the Regional CARICOM Sustainable Energy Roadmap, regional targets for renewable power capacity (including marine renewable energy) have been identified for the short term, 20 % by 2017, the medium term, 28 % by 2022, and the long term, 47 % by 2027 ⁽⁶¹⁾.

The Caribbean-Amazonia sea basin could be a candidate for the location of marine renewable testing and demonstration projects.

Marine renewable energy may increasingly be a viable option for many islands in the region in the coming decade, and can reduce a near-total dependency on imports of diesel and other fuels. This development will generate added value, and could provide new job opportunities.

The competitiveness of the activity is linked to:

- The potential to attract foreign investments (4 strategies were established to tackle this issue);
- Availability of public funds in some territories (or tax reduction or exemption);
- Research activities, which should be continued.

The cost of some technologies poses challenges for the development of the sector in the region.

Looking at assessments carried out in ORs, specifically as regards **Martinique**, it has been considered that the activity should have a low impact in terms of job creation (around 50) and value added (considering the limited size of the Martinique economy). However, the strategic importance of the sector is greater than the economic impact produced by this activity.

⁽⁵⁹⁾ A concept paper for the preparation of a strategic plan on maritime transport services for the CARICOM single market and economy., <http://docslide.net/documents/concept-paper-maritime-transport.html>.

⁽⁶⁰⁾ Guadeloupe Port Caraïbes, internal statistics.

⁽⁶¹⁾ Caribbean Sustainable Energy Roadmap http://www.worldwatch.org/system/files/C-SERMS_Baseline_10.29.2015.pdf.

1.1.5.6 Blue biotechnologies

In **Guadeloupe** and **Martinique**, there has been a good involvement of private operators within the framework of the call for projects on *sargassum* weed, and several projects have emerged. Nevertheless, the supply of *sargassum* weed is not regular, and the project has not yet started operationally.

In Guadeloupe, the development of marine aquaculture (and related blue biotechnologies) is limited by the possibility of being granted maritime concessions, in particular in the Grand-Cul-de-Sac Marin, which includes a marine reserve linked to the national park.

The potential for competitiveness is difficult to assess as the sector is at a pre-development stage, research capacities are limited, and high-skill profiles are still lacking. However, the involvement of the private sector could represent an opportunity for development, and the sector could benefit from FDI. Opportunities for both employment and value added could emerge if cooperation and strategic partnerships are established with academia and international pharmaceutical companies.

1.1.6 Conclusions on concrete measures by type and timeframe

Following the analysis carried out at sea basin level and in each OR included in the area, the conclusions given below emerged. Conclusions have been grouped into three sets (legislative, non-legislative and financial), depending on the type of needs and the possible intervention measures which might be undertaken to fulfil the potential of each activity at sea basin level and in each OR. A possible time frame has been indicated for each conclusion, namely (i) short to medium term, for actions which could require an implementation period of between 0-5 years and (ii) medium to long term, for actions which could require an implementation period of between 5-10 years.

More details on conclusions are available in chapter 14 of Annex 10 for the Caribbean-Ama-zonia at sea basin level and in chapter 13 of Annexes 1, 2, 3 and 4 for related ORs.

1.1.6.1 Fisheries and aquaculture

Legislative conclusions

a) Fighting Illegal, Unreported and Unregulated (IUU) fishing

Despite important political commitment in the area for combating illegal fishing, the implementation of the Agreements against IUU has not been a success. Efforts to continue the implementation of these Agreements should continue, however, setting up concrete action plans and expanding the network, and involving other territories that face similar issues in the Caribbean-Ama-zonia basin (Guadeloupe and Saint-Martin for instance). The Agreement implementation should be followed up, and be constantly monitored.

In order to increase the efficiency of these measures, control and monitoring capacities should be reinforced, by creating an innovative monitoring system (e.g. satellite, tracking tools, etc.). In this regard, Saint Kitts and Nevis is the first country to install port inspection measures of international best-practice standards. National agencies have received effective support from FAO through training and technical support to develop new fisheries, aquaculture and marine resource regulations.

All countries in the area should be involved in this long-term action, with a primary commitment of central authorities.

Geographic scope of conclusion: sea basin level, especially in Guadeloupe

b) Public-private consultation should be launched for exploring the possibility of tackling fleet renewal

The study showed that the fleets operating in each of the EU ORs are ageing, and need to be renewed. Since fleet renewal is not encompassed by CFP regulations, public-private consultations should be launched to identify possible actions and funding sources for renewing fleets. Possible actions to be undertaken are:

- Inventorying of fleets currently needing renewal, in order to 'quantify' the type of investment needed;
- Launch of consultations for exploring possible synergies for sustaining the renewal.

The consultation is a short to medium term action, and should be activated by local administrations, envisaging the involvement of EU and national administration, as well as all related stakeholders.

Geographic scope of conclusion: Guadeloupe, Martinique, Saint-Martin and French Guyana

c) Reinforcing regional cooperation for the management of the fishery resource

Cooperation is needed for improving the management of shared resources and for organising regional markets. The primary condition for strengthening cooperation at a local level is the political commitment of local and central administrations. All four ORs, in fact, are part of the Caribbean-Amazonia area, and a greater involvement in local cooperation initiatives for the management of the fishery resource should be pursued. Although this action can be launched in the short term, the effective integration of Martinique and other ORs in different local cooperation frameworks can be attained only in the medium to long term.

Geographic scope of conclusion: Guadeloupe, Martinique, Saint-Martin and French Guyana

d) Streamlined administrative procedures for aquaculture

Administrative procedures for licensing companies to produce in areas identified as favourable for aquaculture production should be simplified. This action should be anticipated by an analysis of the maximum number of concessions which could be granted in Guadeloupe, and their location. Once possible sites are identified, licensing procedures should be re-examined to reduce times for granting concessions and increase the number of requests for developing this activity. It is a short-term action that requires the inter-vention of the local administration.

Geographic scope of conclusion: Guadeloupe

Non-legislative conclusions

a) Strengthen knowledge about marine resources

As the study showed, in the Caribbean-Amazonia sea basin and specifically in each OR, there is a strong need to reinforce knowledge about fish resources and to improve the monitoring of catches, to be able to promote a sustainable management of the resource. It is a short to medium term action, that should be activated by Central and local administrations in collaboration with research institutes. The latter should play a pivotal role in this action, since the first key step to be undertaken is to reinforce research capacities, developing a continuous monitoring of stocks and catches and establishing continuous technical support and knowledge transfer to fishermen.

Geographic scope of conclusion: sea basin level, and specifically in each OR

b) Reinforce training and education and knowledge exchange on aquaculture

Aquaculture training is not easily available, and is a common constraint for the development of the industry throughout the region. Specific training sessions for project holders as well as employees are needed, and would improve the sector's resilience. Launching training sessions is a short to medium term action, and would require the active participation of all stakeholders

involved in the sector (local administrations, professional organisations, research institutes, training centres and private stakeholders). As a first step, a survey could be conducted with promoters and professional organisations to identify training needs. The setting up of working groups involving the public and private sector could help with the identification of training needs. The involvement of the Blue growth industry is a key point to develop relevant training and educational programmes for the sector. The action could be supported by structural funds from a financial point of view.

In addition to the development of training programmes, awareness campaigns on Blue Growth careers should be developed in different ORs and at sea basin level. These campaigns would be conducted with the cooperation of industry, training centres and public institutions.

Geographic scope of conclusion: sea basin level

c) Support new opportunities for the diversification of fisheries

As highlighted by OR stakeholders, the diversification of fisheries activities could offer alternative revenues for fishermen, especially in coastal tourism activities. In order to achieve this objective and explore the potential of diversifying activities, a capacity-building action to improve on board safety should be undertaken, in order to ensure the highest safety standards for tourists on board. This also requires investments for boats to make them suitable for hosting tourists. Furthermore, better communication channels should be activated for promoting these activities, and there should be cooperation between professional fishery organisations and tourism agencies (public and private). This step is essential in moving away from individual initiatives and building up long-term collaboration and a holistic strategy.

Maritime activities carried out by fishermen should also be promoted using fisheries' local action groups, in order to integrate this activity in their projects.

This action should not take a long time to be implemented (short to medium term action), but requires the active involvement of all stakeholders of the fishery and tourism sectors (local administrations, professional organisations, training organisations, fishermen, tourism agencies, etc.).

Geographic scope of conclusion: Guadeloupe, Martinique, Saint-Martin and French Guyana

d) Development of a pilot project for new fisheries

Not all possible stocks are targeted in French Guiana, and the present small-scale segment faces important challenges, such as the stagnation of fish prices, underinvestment and low diversification.

There would be a strong interest in developing pilot projects to identify new fishing techniques, viable for fishermen and sustainable for the environment. It is a short-term action which should be promoted by local administrations, but should involve professional organisations and fishermen.

Geographic scope of conclusion: French Guyana

e) Increase level of education for fishermen

The level of education of fishermen is a key issue in French Guiana and Martinique, where a very small percentage of fishermen have primary school qualifications. For this reason, there is a strong need to develop educational schemes, also for the purpose of increasing the entrepreneurial capacity of small-scale fishermen. Different steps will be implemented to develop these educational schemes: definition of programmes in collaboration with the industry, reduction of administrative burdens to obtain subsidies for the participation of fishermen, communication on training sessions, adaptation of the educational scheme to fishermen's needs and constraints.

An improvement of skills is important in several areas: fishing methods, sustainability, safety, quality, communication and diversification of sources of income (for direct sales and pesca-tourism). A first step to be undertaken is the identification of barriers that hinder the

involvement of fishermen in training. This could be done in collaboration with the industry by identifying fishermen's needs, and promoting the fact that training courses could help them to tackle and meet those needs. The setting up of a working group could be useful for adapting training sessions to fishermen's needs and constraints.

In addition to the development of educational programmes, awareness campaigns on fishery careers should be developed in different ORs and at sea basin level. These campaigns should be carried out in close synergy among the industry, training centres and public institutions.

Geographic scope of conclusion: French Guyana, Martinique, Guadeloupe and Saint-Martin

f) Structuring the sector

The fishery sector and the supply chain in general is not well structured in Saint-Martin, as the market is not able to meet local demand, due to structural gaps. For this reason, some key actions need to be undertaken which will require the active involvement of central and local administrations, but also professional organisations and the private sector (restaurants, supermarkets, etc.). Key actions are:

- Establish landings points with sanitary standards;
- Consolidate supply in terms of quality and diversity (number of species);
- Establish contracts with local supermarkets or restaurants.

This is a medium to long term action, and should be led by local stakeholders.

Geographic scope of conclusion: Saint-Martin

g) Development plan for fisheries and aquaculture infrastructure and equipment

The fishery sector in Martinique has an overall lack of infrastructures (landing sites, storage equipment, etc.). For this reason, a strategic fishery infrastructure plan should be developed. As regards aquaculture, the sector is facing some difficulties in supplying businesses with fries, and the composition of feed has had an impact on production in the last decade. Further analysis on investment opportunities will be developed.

A preliminary analysis of infrastructure needs and related equipment should be carried out, surveying and assessing feedback from sector stakeholders and elaborating a strategic plan for fishing port infrastructures. This is a long-term action, and should be promoted primarily by National and regional authorities, involving the sector's stakeholders.

Geographic scope of conclusion: Martinique

Financial conclusions

a) Improve access to credit

Guarantee systems and fiscal mechanisms should be developed and made available to project holders in order to allow them to make investments in fisheries and aquaculture sector. The action could be activated by local public funding agencies, and could be activated in a short time.

Geographic scope of conclusion: sea basin level, and specifically in each OR

1.1.6.2 Coastal tourism

Legislative conclusions

a) Promote a common Caribbean image

This action should be undertaken by governments and central administrations, in collaboration with local tourism offices of all territories in the area (as successfully tried out in the Baltic), and is a short to medium term action. Once all governments agree on this need, the first step envisages the design of a brand and a marketing strategy in order to define a common Caribbean image, encompassing all territories, and ensure the widest access to media. This strategy should also focus on the improvement of coordination and collaboration at national

and regional levels between different stakeholders (travel agencies, airlines, tour operators, hotels, etc.) in terms of promoting and advertising the Caribbean image.

Geographic scope of conclusion: sea basin level

Non-legislative conclusions

a) Creation of training courses and life-long training in coastal tourism

The lack of skilled workers in the industry at all levels has been cited as a weakness in the sea basin. In Guadeloupe and Saint-Martin, but also in French Guiana and Martinique, human resources with low qualifications are often employed in the tourism sector, especially in restaurants and accommodation activities. Considering that coastal tourism is the current main employer in the OR economies, adequate training of personnel is needed for achieving the growth potential of this activity.

As a first step, training needs should be identified. This issue should be treated in collaboration with the industry, for instance through a survey of needs to all tourism stakeholders. Based on results of this consultation, a training strategy should be elaborated, adapting it to the sector's needs (long-term training or more immediate courses).

Different levels of training will be needed:

- Specific training sessions for public and private stakeholders to exchange best practices. These training sessions could be conducted in collaboration with regional organisations.
- Training and educational programmes for stakeholders and staff involved in the industry on communication, language, use of technology, management, etc.
- Awareness campaigns should be developed to promote careers in the tourism sector.

In the longer term, these educational programmes would help to:

- Spread tourism understanding among local communities, as tourists are sometimes perceived as a factor for environmental degradation, and improve the competences and skills of local tourism stakeholders;
- Mitigate the negative effects of tourism, where the tourism sector is causing damage to the environment;
- Build institutional capacities;
- Create frameworks contributing to the development of small management enterprises.

While developing this activity, it is also important to collaborate with neighbours to exchange best practices in this specific field.

Geographic scope of conclusion: sea basin level, especially in ORs

b) Define alternative forms of tourism: more sustainable tourism activities

Tourism activities can be harmful to the environment in a variety of ways. Promoting more sustainable activities is highly recommended to reduce the impact on the local environment, which is the essential asset of the region. This conclusion requires a new approach, involving both the industry and government reconceptualising tourism, hotels and the tourism product in ways that makes it globally competitive. This new approach needs the involvement of various stakeholders. The following steps can be envisaged:

- Setting up a working group to develop guidance in sustainable tourism is a pertinent first step in identifying priorities;
- Elaboration of an action plan to achieve the set objectives (actions to carry out, expected outcomes, sources of funding, etc.).

A possible best practice to be followed in this sense would be the 'Ecotourism project' in French Guiana's Park: the priority is to support projects that respect the natural environment, in particular in the field of ecotourism, as and promote cultural heritage for sustainable local development.

The development of this new tourism model would envisage the primary involvement of central administrations, which would be able to provide a more holistic vision of possible approaches, supported not only by tourism organisations and research institutions but also natural parks in

the area. This is a medium to long term project, as it would require significant commitment from several parts of the economy.

Geographic scope of conclusion: sea basin level, but specifically in each OR

c) Nautical tourism: Creation of a working group to implement recommendations made by experts from National Authorities on the attractiveness of marinas in Outermost Regions.

Following the analysis carried out by the 'Inspection Générale de l'Administration' (IGA), the 'Contrôle Général Economique et Financier' (CGefi) and the 'Conseil Général de l'Environnement et du Développement Durable (CGEDD)' and the related recommendations issued, there is a need to create a working group to implement the recommendations for the development of nautical tourism in OR.

The working group should define an action plan based on the recommendations, and provide a follow up and monitoring of the implementation of these recommendations. The creation of the working group is a short-term action, although it should be kept operational as the different actions suggested are being implemented. The working group should be created by National authorities, and should envisage the involvement of local authorities and professional organisations.

Geographic scope of conclusion: Guadeloupe, Saint-Martin, French Guiana and Martinique

d) Support for the implementation of the strategy defined for the tourism sector

Several limits have been identified in the analysis of the tourism sector in Martinique, especially the lack of investments in the accommodation sector, lack of relations between cruise tourism and coastal tourism, the high seasonality, the lack of specific skills in different areas of tourism, and the overall lack of organisation in the sector. A regional strategy is under development in Martinique, being prepared by the Regional authority, and it is essential to implement this strategy and identify useful monitoring and follow-up systems. The development of such measures for implementing the strategy should be undertaken by the Collectivité territoriale de Martinique, together with the Comité Martiniquais du Tourisme and stakeholders involved in the tourism sector.

A similar strategy has been also developed in French Guiana, elaborated by the Comité Régional du Tourisme. In this case too, this strategy needs to be implemented and monitored during its execution.

Geographic scope of conclusion: Martinique and French Guiana

e) Improvement of cooperation with other territories

Martinique, French Guiana, Guadeloupe and Saint-Martin face challenges in common with other Caribbean territories and ORs: a high share of tourism in the local economy, importance cruise tourism, high seasonality, remoteness, lack of investments, etc. These territories, both ORs and non-EU territories, could appear as competitors, as similar tourism offers could be proposed to tourists (since they share the same or similar assets). On the other hand, cooperation on specific topics may be positive for all stakeholders and all territories in sharing experiences and improving the image and notoriety of the sea basin. This action should be promoted by local and national authorities, following the example of CARICOM cooperation projects in tourism, which has contributed to reducing conflicts among territories in the tourism sector.

Geographic scope of conclusion: Guadeloupe, Saint-Martin, French Guiana and Martinique

f) Reinforce knowledge of the sector, in particular of the nautical sector

The tourism sector, and in particular nautical tourism, is not well known in Saint-Martin, and there is limited knowledge about its economic importance. As the analysis showed, a tourism

observatory needs to be created for the purpose of filling this gap, creating knowledge and monitoring the sector. Local administrations should be the key actors to activate this initiative, which could be developed in the short to medium term.

Geographic scope of conclusion: Saint-Martin

g) Develop marina capacities and raise their attractiveness

Saint-Martin has very favourable conditions for yachting, but marina capacities could be further improved. The renovation of existing marinas (for medium-size cruise ships), development of new services (restaurants, refuelling, etc.) and improvement of the waterfront could also help to boost nautical tourism. This should be led respecting the local bio-diversity. Security in the marinas should also be reinforced. This is a medium to long term action, which should be activated by local administrations and involve local stakeholders.

Geographic scope of conclusion: Saint-Martin

Financial conclusions

a) Support improvement of the accommodation sector

The hotel offer in all ORs does not come up to international standards, especially if compared to North America and European standards. Investments are needed to support the sector, which could originate from private or public sources. Looking at the potential of coastal tourism for attracting FDI, all ORs in the area possess adequate assets for attracting these investments and improving the accommodation level of hotels.

Several countries in the Caribbean-Amazonia have stepped up their efforts at reviewing regulations in the tourism sector in order to attract FDI, mainly in hotels and restaurants (Antigua and Barbuda, Barbados, St. Lucia, Grenada, Suriname, etc.). According to a study⁽⁶²⁾ on FDI benchmarking in the Caribbean, the factor that foreign firms find the most important for their investment in tourism is infrastructure, followed by administrative procedures.

The examples of Antigua and Barbuda, Barbados, St. Lucia, Grenada, Suriname could be followed in ORs for better regulating (or de-regulating) the sector, and paving the way for attracting investments in the area. This action should be undertaken by local administrations, and could be developed in the short term.

Geographic scope of conclusion: Guadeloupe, Saint-Martin, French Guiana and Martinique

1.1.6.3 Cruise tourism

Legislative conclusions

a) Strengthen regional cooperation to improve connectivity, set up a regional cruise line strategy and increase the impact of cruise tourism

A regional cruise line strategy addressing issues of concern to the industry should be developed, mainly for:

- Improving the operating conditions of cruise lines. The objective is to increase the collective influence of destinations in negotiations with cruise companies;
- Advocating for environmental standards for cruise operations;
- Establishing mechanisms for maximising the benefits of cruise activities to national economies;
- Diversifying products (premium vacations, special cruise options, etc.) taking into account the capacities of ports in terms of infrastructure.

⁽⁶²⁾ Benchmarking the FDI Environment in the Caribbean,
<https://openknowledge.worldbank.org/bitstream/handle/10986/25061/Demystifying0t0the0Caribbean0Region.pdf?sequence=4>.

This is a short to medium term action, which should be activated by governments and central administrations (with the participation of the European Commission) and involve private sectors and cruise companies.

In this context, a first regional cruise dialogue for the Baltic was organised by the EU Commission in Copenhagen. This dialogue was aimed at fostering solutions for cruise tourism and bringing stakeholders closer together in a common effort for a more sustainable and competitive sector in the Baltic region. The participants to this first dialogue agreed on several conclusions and suggestions regarding the promotion of destinations (joint branding and communication schemes for instance), the management of port and city relations and the environment (sustainable policy in the Baltic Sea region, with the aim of mitigating the impact of cruise tourism on local inhabitants, the marine environment and the air quality). A similar forum was held for the first time for the Mediterranean region, with the support of the European Commission. This dialogue catered to a specific request from stakeholders for the promotion of structured dialogue on cruise tourism, in order to enhance synergies in the sector, targeting best practice-sharing in innovation, competitiveness and sustainability strategies.

Geographic scope of conclusion: For each OR, potentially to be extended to the sea basin

Non-legislative conclusions

a) Improving the attractiveness of Pointe à Pitre

As regards Guadeloupe, the city port waterfront needs to be improved, since it is the first point of attraction for cruise vessels in a port. The renovation of the waterfront should include the development of new services, infrastructural facilities, cultural and leisure structures (restaurants, market with local food products, etc.). An analysis should be conducted to identify specific needs and possible development options. This is a long-term action, which should be promoted by local authorities.

Geographic scope of conclusion: Guadeloupe

b) Improve port's infrastructure to ensure the safety of cruise ship arrivals

An in-depth economic and environmental impact study of the cruise sector should be carried out in order to assess the potential of the island to receive mega yachts and large cruise vessels. The study will help to define development needs and required investments, while limiting environmental impact. Infrastructure investments are needed for safety reasons (bad water conditions), with the creation of a dock and increase in the draught. This is a medium-term action, which should be promoted by central and local administrations.

Geographic scope of conclusion: Saint-Martin

c) Development of local small cruise paths (i.e. micro-cruises)

Micro-cruises have been successfully trialled in many locations worldwide, and could be undertaken with different types of ships. In French Guiana, considering the distance from main cruise routes, the identification of possible small local cruise routes close to the coast or in the Amazonian rivers could be an important activity to be exploited in the future and create new jobs and opportunities for the local economy. As a first step, possible investors interested in such cruises should be identified, to back the investment and define possible routes. Therefore, adequate promotion, including through institutional channels, should be carried out, to ensure the widest visibility for micro-cruises.

This is a medium-term action, which should be initiated by local administrations.

Geographic scope of conclusion: French Guiana

Financial conclusions

a) Investments for the expansion of port facilities to accommodate larger vessels

Investments are needed to accommodate ever larger cruise ships and increase the number of berths available. Investments should also deal with effects generated by overcrowding, since environmental issues related to waste disposal or sewage treatment, which need appropriate engineering measures, have financial implications for the development of adequate infrastructures.

This is a long-term action, which should be led by local administrations.

Geographic scope of conclusion: sea basin level

1.1.6.4 Shipping

Legislative conclusions

a) Cooperation between port administrations in the region

Collaboration is needed among territories for strengthening port logistics, service standards and technological innovation for globalised, logistically competitive and sustainable trade in the area. A network for collaborating, sharing experiences and implementing common projects should be set up. It is an action which could be launched in the short term, whose duration is expected to continue in the future. The purpose of this action is to reduce competition among ports and develop complementarities in terms of specialisation and types of flows managed. Port administrations should play a pivotal role in this action, in collaboration with private institutions and research institutions.

Similar success stories have been identified in the area, such as the Programme for the creation of the Digital and Collaborative Network of Latin American and Caribbean Ports, led by the Latin American and Caribbean Economic System (SELA) and the CAF-Development Bank of Latin America since 2014.

Geographic scope of conclusion: sea basin level

Non-legislative conclusions

a) Enhance port efficiency regarding infrastructure, safety and security and human resource skills

This action should be undertaken by Port administrations and local authorities. As a first step, feasibility studies should be carried out in order to optimise infrastructure investment opportunities. Infrastructure investments are needed in order to tackle challenges regarding the increasing size of ships, enhance security and safety and implement IT systems. Infrastructural costs could be met by joint investments by port operators and private companies. Specific studies should be launched to move away from classic methods of logistics and implement technology and IT applications to assist port operations. Furthermore, there should be training not only in the maritime and port sector but also in the logistics sector, to maintain the highest standards in port management and logistics.

Geographic scope of conclusion: sea basin level

b) Improve port infrastructures to increase Saint-Martin's market share of island trade flows

An in-depth economic and environmental impact study of the maritime sector should be carried out in order to assess the potential of Saint-Martin to attract new trade flows (from mainland France in particular). The study will help to define development needs and required investments, while limiting the environmental impact (as regards dredging in particular). The study should be promoted by national and local administrations and involve port authorities.

Geographic scope of conclusion: Saint-Martin

c) Develop human resource skills in the sphere of ship repairs

Current ship repair capacities are not sufficient to satisfy the increasing demand for leisure boats. Such service should be guaranteed in all ORs, but this emerged as a key action in Saint-Martin. Priorities for training to develop specific skills should focus on metalworking and careening, but also on electronics. Such programmes should be developed in collaboration with the industry. Further specialisation could be discussed among relevant stakeholders (from private and public sector) in a roundtable setting.

Geographic scope of conclusion: Saint-Martin

1.1.6.5 Renewable energy

Legislative conclusions

a) Strengthen cooperation in the Caribbean region

All territories in the Caribbean-Amazonia basin face similar challenges in terms of energy supply. Ocean renewable energy could be an important supply in the future, but cooperation in the area should be supported to tackle challenges related to data sharing, exchange of best practices and investment sources.

All stakeholders should be involved in this cooperation initiative, which should be promoted by the Central administration. The existing network within CARICOM could be extended, involving countries (ORs) and regional organisations. This cooperation framework should be used for tackling challenges regarding the technology for ocean renewable energy (funding sources, research capacities, etc.)

Geographic scope of conclusion: sea basin level

Non-legislative conclusions

a) Support the emergence of projects on marine renewable energies

Local administrations should advocate any useful proposal aimed at exploring the development of blue renewable energies by supporting promoters at different levels of their project implementation, namely:

- project preparation: by providing technical and legal orientation;
- investment support for small and medium projects, and developing financial engineering;
- provide training when needed.

This is a short-term action, whose implementation should be ensured in the long term. It should be activated by local administrations.

Geographic scope of conclusion: Guadeloupe

b) Strengthen cooperation with regional organisations

Central administrations should support cooperation with regional organisations (United Nations Industrial Development Organisation for instance) for backing capacity building and knowledge exchange in the field of renewable energy and energy efficiency. A success story in this field is the 'Capacity Building Programme on Renewable Energy' (in the framework of the regional project Observatory for renewable energy in Latin America and the Caribbean). This training programme provided professionals and policy makers with deep and updated knowledge on energy technologies. The objective was to boost investments on renewable energy in the region.

This is a short-term action, to be activated by central and local administrations

Geographic scope of conclusion: Guadeloupe, Martinique and French Guiana

c) Support feasibility study in French Guiana for hydrokinetic power

This sector is at a pre-development stage. The local authority (Collectivité Territoriale de Guyane) is considering the possibility of backing a study to analyse maritime streams and

assess the potential of hydrokinetic power. While the feasibility analysis could be completed in the short term, the possible implementation of the project could take longer.

Geographic scope of conclusion: French Guiana

1.1.6.6 Blue biotechnology

Non-legislative conclusions

a) Development of regional knowledge base for marine biotechnology

The establishment of centralised facilities, such as biological resource centres, should be considered for the Caribbean-Amazonia basin. Furthermore, developing strategic partnerships and international collaboration with academia and international pharmaceutical companies could offer opportunities to achieve strategic, scientific and economic gains from the largely unexplored resources of the Caribbean region.

This is a medium to long term action, which should be initiated by local authorities.

Geographic scope of conclusion: sea basin level

b) Support for research and networking on valorisation of bio-resources

The valorisation of bio-resources is at a pre-development stage, but sharing experiences between different territories could foster innovation. As a short-term objective, to be initiated by local and central administrations, a call for projects for the valorisation of bio-resources in ORs could be launched in order to support R&D on bio-resources. Cross-national networks could be created for this purpose, also involving other territories. A possible best practice to be followed in this context is the European Innovation Partnership, through which the participation of researchers and end users of innovation serve to foster the cross-fertilisation, transfer and dissemination of research activities.

Geographic scope of conclusion: All ORs

1.2 South West Indian Ocean

The sea basin is particularly relevant in fishing activities, especially for migratory tuna, with the Somali basin to the north and the Mozambique Channel being key catching areas. Coastal tourism plays an important role, especially in Seychelles and Mauritius and to a lesser extent in Madagascar and in Réunion. Seychelles and Mauritius are positioned in the market as luxury destination for European and Asian countries.

Climate change is forecast to occur in the sea basin through more severe extreme weather events (stronger cyclones) and sea level rise⁽⁶³⁾. Small islands developing states are likely to be more impacted by climate changes due to their high dependency to natural resources and external energy. OR and the sea basin, through the Indian Ocean Commission, anticipate the need for adaptation by the implementation of climate adaptation strategies through regional and territorial action plans (see last sections of Chapters 1 in Annexes 5,6 and 11).

Adopted in 2013, the EU Climate Change Adaptation Strategy⁽⁶⁴⁾ recognises that Outermost Regions are territories vulnerable to the impacts of climate change. Consistent with the French national climate change adaptation strategy, Réunion and Mayotte adopted respectively a Regional Plan for Climate, Air and Energy in 2013 and a territorial plan to climate change adaptations (Plan Climat Energie Territorial) in 2016. In Réunion, local authorities (the Conseil Régional, the Conseil départemental and community of towns) ought to implement their territorial plans to climate change adaptations based on the Regional Plan too.

Maritime economic sectors forecast to be impacted are mostly fisheries and tourism through changes of fish habitats and migration patterns especially for highly migratory fish like tuna and, for tourism, by modifications of the biodiversity and impacts to the sea basin territories such as the coasts by soil erosion.

1.2.1 Mapping of the state of art of maritime activities

In the paragraphs below the main findings are given for each maritime activity (from more traditional up to more innovative activities) identified at sea basin level and in each OR. Furthermore, the main organisations and actors operating in the maritime sector are also specified. Detailed findings of mapped maritime activities, main strategies and stakeholders for the South West Indian Ocean sea basin and related ORs are given in Annexes 5, 6 and 11, in the following chapters:

- chapter 1: mapping of all maritime activities;
- chapter 5: list of public authorities;
- chapter 6: list of maritime strategies;
- chapter 7: list of stakeholders.

1.2.1.1 Fisheries and aquaculture

The **Western Indian Ocean** is an important fishing area for migratory tuna, with the Somali basin to the north and the Mozambique Channel being key catching areas. The Seychelles is the main landing port for a large EU fleet of purse seiners (80 % of purse seine landings), with fishing being canned locally or sent to Mauritius by reefer (70 % of landings in the Seychelles) for further processing and canning. Mauritius is further from the fishing grounds, but has developed into an important regional 'seafood hub'. Madagascar is a less important port to land and tranship tuna with its port and tuna cannery in Antsiranana, but has a larger seasonal fishing ground in the Mozambique Channel. The Comoros also licenses access to overseas fishing interests, including the EU (through its distant water fishing fleet), although does not have any associated shore facilities. Catches have been steadily increasing, but it is now recognised that of the main species, yellowfin tuna, is now unsustainable, and harvest control limits are gradually being introduced by the Indian Ocean Tuna Commission (IOTC).

⁽⁶³⁾ European Commission, 2014, The economic impact of climate change and adaptation in the Outermost Regions,

http://ec.europa.eu/regional_policy/sources/activity/outermost/doc/impact_climate_change_en.pdf

⁽⁶⁴⁾ <http://climate-adapt.eea.europa.eu/eu-adaptation-policy/strategy>

Red drum farming to produce premium fish occurs in Mauritius, with signs of growth to meet a regional demand, Réunion (hatchery only) and Mayotte. Seaweed production for cosmetics is also present in Madagascar. Marine aquaculture at large scale is currently not developed in the sea basin due mainly to:

- competition with other sectors such as tourism in coastal waters (mainly lagoons);
- the remoteness of the territories from the international markets;
- production costs to reach consumers at competitive prices (compared to other fish sold on the markets); and
- current technologies still not available at affordable prices to produce fish in cyclone conditions and offshore at competitive costs compared to traditional cage technology.

Fishing in **Mayotte** consists of both industrial and artisanal fishing. The industrial fishing vessels are a distant water fishing fleet that targets tuna and does not land in Mayotte. In 2014 the local fishing fleet consisted of 800 dugout canoes, 250 small fishing boats and five small modern longline vessels (less than 10 m). Around 160 t of fish were recorded as being caught annually, mainly pelagic fish (tuna and swordfish) and reef fish (snapper and grouper). There is no industrial infrastructure dedicated to fishing activities in Mayotte. In general, the fisheries sector is still unstructured. As regards aquaculture, Mayotte used to produce about 150 t of drum fish (*Umbrina* spp.) per year. Production recently collapsed. Since 2015, the local hatchery, provider of fingerlings, is not operating anymore due to bankruptcy. In terms of markets, about 60 % of the farmed fish were exported mainly to the EU (62 t to the EU market, mainly France and Italy) ⁽⁶⁵⁾.

Fishing activities in **Réunion** can be categorised in three types: (i) artisanal fisheries, (ii) chilled longline tuna fishing and billfish fishing; and (iii) distant water fisheries (tuna fishing and toothfish fishing). Around 200 artisanal fishing vessels are based around the coast of Réunion. Targeted fish are snappers, groupers, emperors (*Lethrinus* spp.), squids, tuna, dolphinfish and marlins. Catches are mostly directed to the local market. Longliners fishing further offshore are 12-25 m long. They are not authorised to fish within the 12 nautical miles' zone from the shore, an area reserved for coastal fisheries.

Fishing of Patagonian toothfish is an important industry. The sector exported about 4 100 tonnes (live weight equivalent) of fish mostly to the US and Asia in 2013 ⁽⁶⁶⁾. The sector provides 300 direct jobs and between 1 200 and 1 500 indirect jobs according to the delegated French Bank Institut d'Émission des Départements d'Outre-mer ⁽⁶⁷⁾.

With regard to aquaculture, marine aquaculture used to produce a few tonnes of market sized drum fish a year. The outgrowing sector was in direct competition with a local drum fish producer in Mauritius, targeting and providing fish to the same markets (Réunion and Mauritius mostly). The hatchery is still operating, and provides fingerlings to Mauritius' producer, funded by local stakeholders. A small local production of spirulina (microalgae and seaweed) is emerging, gaining experience of the optimal conditions needed to produce it.

1.2.1.2 Coastal tourism

Looking at activity at **sea basin level**, tourism is a key economic activity in both the Seychelles and Mauritius and to a lesser extent in Madagascar and Réunion. Two types of tourism can be observed in the area, visiting friends and relative tourism (Réunion, Mayotte and Comoros), and leisure tourism (Mauritius, Seychelles, Maldives). Tourism in the Seychelles and Mauritius continues to grow slowly, with growth limited by the lack of available coastal sites. Madagascar, which is a much larger territory, has considerable potential for developing coastal tourism, but compared with Mauritius, Seychelles and Réunion it is hampered by poor infrastructures, economic and political uncertainty, at least in the short to medium term.

⁽⁶⁵⁾ Annex 5, § 1.1.1 — aquaculture.

⁽⁶⁶⁾ Plan de compensation des surcoûts du secteur de la pêche et de l'aquaculture de La Réunion, December 2015.

⁽⁶⁷⁾ IEDOM, 2016. Les Terres australes et antarctiques françaises — Acteur de l'économie bleue au coeur de l'océan Indien. Note expresse N° 368, www.iedom.fr.

Comoros suffers from poor infrastructures and inter-island connectivity, as well as occasional political instability.

In **Mayotte** tourism is not well developed because of its lack of hosting capacities, although the sector is undergoing structural improvement with the support of the local tourism office. The global hosting capacity is 1 108 beds ⁽⁶⁸⁾. Main leisure activities for tourists are sunbathing, diving and leisure fishing. Whale watching is also a tourist attraction during the austral winter. The hosting and catering branch, which is the main activity of the tourism sector, employed 682 people in 2012 in Mayotte, or 2.3 % of the total workforce employed ⁽⁶⁹⁾. It accounts for 7.7 % of active companies registered. According to the local Tourism committee, from 120 000 to 150 000 tourists per year are expected in 2020. To reach such a level, hosting capacity must be improved based on better quality services and sustainable development to reduce environmental impact on the shoreline and in the lagoon. Local authorities expect tourism to be supported by its marine environmental heritage, which is to be protected by means of marine park management and ecotourism.

Tourism offer in **Réunion** is broad due to the large scope of landscapes for mountain trekking and coastal and maritime activities. In Réunion tourism is therefore driven by non-coastal activities first. Accommodation is the first contributor to the tourism industry, with more than EUR 70 million of added value. 9 000 employees and self-employed workers are active in the tourism industry, making up 4 % of Réunion employment in 2006.

Also, leisure yachting is being investigated by local stakeholders (as emerged from interviews in August 2016). The leisure yachting model is switching from a property model to services provision. Réunion is likely to face this change, while the demand for ring crafts is no longer an activity indicator. Its evolution should indeed be linked with maritime and coastal tourism as part of a global offer to discover the Island. With the growth of tourism, some opportunities might exist for local development.

1.2.1.3 Cruise tourism

At **sea basin** level, global cruise tourism is currently available, with a sea basin tour or islands connection (Seychelles, Mauritius, Réunion, Mayotte, Madagascar). The coastal fringes of Seychelles and Mauritius are both key destinations. In the Seychelles, this is mainly concentrated around the north of the main island Mahé, but also on the smaller islands of Praslin and La Digue, with specialist resorts on other islands.

In **Mayotte**, about 6 000 cruise tourists were registered at Dzaoudzi port in 2008, where cruise boats stop over during their tour around the Indian Ocean (Mayotte's Port directorate). Since 2007 the number of cruise ships that stopped in Mayotte have dropped steadily, from less than 40, which was a regular annual figure in the early 2000s, to two in 2013 ⁽⁷⁰⁾. This decrease can be explained by piracy risks, which have increased in the area according to the International Maritime Bureau ⁽⁷¹⁾. With piracy attacks having decreased since then, deterred by maritime surveillance, the sea basin offer once again shows growth potential. The Longoni port management authorities are investing to attract cruise ships by upgrading its infrastructure (with public support).

Cruise activity in **Réunion** is based on 3 types of cruise offer:

- short cruise trip in Indian Ocean;
- ship connections with mainland;
- part of a worldwide tour, including a stop in Réunion.

High season for cruises is from November to April, with a peak in January. Most short cruise trips in the Indian Ocean have stopovers in Seychelles, Mauritius and Réunion. According to Île de la Réunion Tourism (IRT), calls in Réunion last about 6 hours, with an average expenditure per tourist of EUR 70 per stop.

⁽⁶⁸⁾ https://www.entreprises.gouv.fr/files/files/directions_services/etudes-et-statistiques/stats-tourisme/memento/2013/2013-11-chap3-memento-tourisme.pdf.

⁽⁶⁹⁾ IEDOM, 2015 - Annex 5 section 1.7.3.

⁽⁷⁰⁾ Annual statistics from the Mayotte Port Directorate, especially 2007, 2008 and 2013: <http://www.cg976.fr/services-en-ligne/ressources-documentaires/les-statistiques-portuaires>.

⁽⁷¹⁾ <https://www.icc-ccs.org/icc/imb>.

1.2.1.4 Shipping

Marine transport is a key sector in the **Indian Ocean basin**, whose territories require connectivity, both with other island nations, other continents (Middle East and Asia) and islands in their own territorial waters. The Seychelles has a larger inter-island ferry port in the north of Port Victoria, with regular ferry services to Praslin and La Digue islands. Victoria has also important fish and commercial quays. Mauritius has ferry or cargo ship passenger services with Réunion and Madagascar, as well as with Rodrigues Island to the east. Furthermore, it hosts a longliner fleet, as well as a container terminal and bunkering services. Madagascar has shipping lines with South Africa and Mozambique to the west, and Réunion and Mauritius to the east. It has five container terminal hubs and six other major seaports. Réunion also has a regional hub operating for one important shipping company (CMA-CGM). Passenger traffic is also running between Comoros (Anjouan) and Mayotte.

Prior to the acquisition in 2015 of cranes, stacker and special trailers for moving containers in port areas, almost all boats were dedicated to transshipment to and from Port Louis (Mauritius) or, more recently Djibouti, then Mayotte was served by feeders (small container). Now, large container ships can stop in Mayotte. Recent studies e.g. the 2015 master plan for Port Louis, suggest that demand will continue to grow, albeit rather slowly, to support overall economic development. Passenger traffic is mainly restricted to inter-island connectivity, which is especially important in the Seychelles. Since 2015, the influence of the development of the Hub in Réunion (Port Réunion) and the development of transshipment and port capacities in Mayotte (Longoni port) must be taken into account in the area for global import and export goods flows.

The Mauritius economy grew at a yearly average rate of 4 % from 2007 to 2015 ⁽⁷²⁾, and it is likely that Port Louis will continue to expand to support this growth. The Freeport area is still developing, and fish processing is diversifying to newer high value products. In the Seychelles Victoria is also expanding, partially to counter Mauritius' recent successes, especially with its seafood hub concept. In Madagascar, port development has been mostly in the private sector to support mineral export ventures.

Since 2015 the development by a single shipping company of its regional hub in Réunion (Port Réunion) and the transshipment activities and new port capacities in **Mayotte** (Longoni) have influenced the global imports and exports of goods in the sea basin. The tonnage handled at Port of Mayotte has increased by 66.5 % over the past decade, due to the importance of freight transit (transshipment) activity. If the main activity remains focused on imports (50 % of the tonnage handled in 2014, including hydrocarbons), the transit of goods is booming: the tonnage transhipped makes up 32 % of the total in 2014, against 4.3 % in 2008 ⁽⁷³⁾. As regards passengers, because of a lack of terrestrial urban transport and traffic congestion on current terrestrial roads, maritime urban transport has large potential. The Conseil départemental de Mayotte launched a project in 2014, with EU funding, to be provided with 2 new vessels for supporting passenger mobility in Mayotte. One of them has been completed in 2016 and the second one is expected to be finished in 2017. Port activities employ nearly 500 people (see Table 1 Annex 5), mainly engaged in transshipment.

As regards **Réunion**, in early 2016 its port handling capacities were put into operation to foster its role as a regional goods exchange platform to support the CMA CGM new regional hub, a concrete tool for regional services and exports. 'Le grand port maritime de La Réunion' (GPMR) is well known for maritime companies operating in the region, but it is a very 'expensive' port, like Mayotte, considering that operating costs are the most expensive ⁽⁷⁴⁾ in the South West Indian Ocean.

⁽⁷²⁾ www.tradingeconomics.co, see time series 2006-2015:
<http://statsmauritius.govmu.org/English/Documents/Historical%20Series/nationalacc/naseries/WEB%20NA%20Series%20September15.xls> (Table 2 – GDP at market price).

⁽⁷³⁾ IEDOM (2016) 2015 Mayotte. Edition 2016. 198 p. See page 127, last paragraph.

⁽⁷⁴⁾ UMIR — Union Maritime Interprofessionnelle port de la Réunion, August 2016.

1.2.1.5 Shipbuilding and ship repairs

In the **South West Indian Ocean**, none of the four countries with important ports, Seychelles, Madagascar, Mauritius, France (with Réunion and Mayotte), can compete with South Africa at a regional level, nor Asian shipbuilders globally for shipbuilding. However, there is some capacity to service the regional fishing industry. Only Mauritius has a major shipbuilding and repair capacity, mainly focused on EU and Réunion purse seiners and longliners, and has a small building capacity. No dedicated major shipbuilding capacity is available in Réunion or Mayotte. All types of repair could be provided in Réunion by training local people and benefiting from know how already available in the OR through technicians of the French Navy based in Réunion.

In **Mayotte**, there are ship repair activities. However, they focus on maintaining the public fleet of vessels for passenger and vehicle transport between Petite-Terre and Grande-Terre. Furthermore, there is a permanently saturated repair site on Petite Terre for leisure yachting. The development of the Longoni Port and, to some extent, leisure tourism, is likely to bring more local demand for ship repairs. The development of ship repair services associated with repair services for leisure yachting is planned at the Longoni port ⁽⁷⁵⁾.

Port Réunion can provide a lot of equipment for ship repairs in **Réunion**. However, no dry dock is available, and therefore ship repair is limited to slipway capacities. The GPMR is assessing the possibility of maintaining 'basic' ship repair services, which are needed in Réunion, while understanding that part of the repair services used by Réunion operators in neighbouring countries will remain in these countries ⁽⁷⁶⁾. As regards shipbuilding, according to INSEE ⁽⁷⁷⁾, building of leisure and sporting boats started recently, but this activity is performed by one major company.

1.2.1.6 Blue biotechnology

The sector is mainly at a research and development stage, and has been observed only in **Réunion**, through the Cyclotron Réunion Océan Indien (CYROI). It is a research platform for biotechnology and innovation, located at the Research and Development hub of St Denis, the Technopole. CYROI is a non-profit public structure with administrative and financial autonomy, enabling collaboration between local organisations and the private sector. CYROI is active in the sphere of marine biodiversity valorisation through its Hydro-Réunion structure ⁽⁷⁸⁾, which is a diversification structure of the former aquaculture association ARDA, and a recently opened research unit conducting marine cosmetic research ⁽⁷⁹⁾. A dedicated cluster, Qualitropic ⁽⁸⁰⁾, is also developing a tropical bioeconomy, in which marine resources are considered as an opportunity for the development of biotechnologies. Qualitropic is supported by the Conseil Régional with EU funding.

1.2.1.7 Marine renewable energies

With all countries in the **sea basin** largely dependent on imported fuel oil for power generation, there has been considerable interest in both wind power development and solar photovoltaic energy, including marine wind farms. However, past projects have suffered from cyclone damage and ongoing maintenance issues.

In the Seychelles, there is already an 8 kWh installation of eight turbines in Victoria that supplies 2.2 % of this island nation's power. Seychelles aims to produce 15 % of power from renewable sources by 2030. There is also some interest in renewable energy in Mauritius: the government says that by 2025 wind energy will account for 8 % of total electricity generation. Within this approach, the country launched preliminary studies for an offshore wind farm development, consisting of understanding cyclonic conditions, tsunamis and the potential

⁽⁷⁵⁾ MCG Longoni port management authority, Coastal tourism. Longoni port application to European Fund in July 2016, document provided to the consultant by MCG.

⁽⁷⁶⁾ GPMR, August 2016.

⁽⁷⁷⁾ National Institute for Statistics and Economic Studies.

⁽⁷⁸⁾ <http://www.cyroi.fr/recherche/hydro-reunion/>.

⁽⁷⁹⁾ <http://www.cyroi.fr/services/unite-bior-recherche-de-molecules-bioactives/>.

⁽⁸⁰⁾ http://www.qualitropic.fr/page.php?postname_fr=secteurs-marches-et-technos-cles.

impact of the site on reefs (Lexpress.mu, 13 March 2017). Mauritius is also looking at relying on locally designed wind turbine technology. Madagascar has set targets of 75 % of electricity generation and 54 % of final energy from renewables by 2020, although this will largely be from hydro power. In general, the northern part of Madagascar (around Antsiranana) and the southern part (around Taolagnaro) have wind speeds of more than 7m/s (50m high), favourable for electricity production.

Réunion has developed research and development activities in marine renewable energies since 2009. Sea water air conditioning (SWAC) is to be used to produce hot and cold air for public infrastructures. Réunion could be a pilot to develop marine renewable energies R&D in extreme weather conditions in the area, following lessons learned by marine renewable energies projects in the last ten years in the sea basin and beyond. Even though 35 % of electricity is produced thanks to renewable sources, Réunion's energy dependence rate ⁽⁸¹⁾ goes beyond 85 %, the territory being dependent on fuel and coal imports ⁽⁸²⁾.

As regards **Mayotte**, a recent study conducted by the French Agency for the Environment and Energy Management (ADEME) on assessing the potential of wave energy concluded that wave energy was still financially unsustainable in Mayotte, although having a potential, and recommended launching commercial applications of a) heat marine energy for sea water air conditioning (SWAC) and b) thermal energy conversion, through a pilot project, initially for the latter technology ⁽⁸³⁾.

1.2.1.8 Other maritime activities

The following table gives all other maritime activities identified in the sea basin, describing them for each OR (or at sea basin level). Detailed analyses carried out on these activities are reported in Annexes 5 and 6 for ORs and Annex 11 for the South West Indian Ocean as a whole.

Extraction of oil and gas

Oil and gas extraction have direct impacts on the environment and on the bio-resources. The development of such activities is not in line with sustainable blue growth. The following paragraph provides an overview of the activity in the sea basin.

At **sea basin level**, although Madagascar has some inland hydrocarbon extraction, offshore oil and gas are not currently a maritime economic activity of significance in the area, even if it is an issue in diplomatic relationships in the Mozambican channel, between France and Madagascar (Îles Éparses ⁽⁸⁴⁾ and Exclusive Economic Zones associated). It is also necessary to take into account France's geographic position in the Indian ocean and its diplomatic relationships with Madagascar (co-management expected on oil and gas resources). Another co-management agreement with Mauritius for Ile de Tromelin was signed with France in 2010. With current low oil prices, it is doubtful that offshore exploration in the deep oceanic waters of this region will be important for some time. O&G prospecting licences have been assigned by the French government ⁽⁸⁵⁾ in the Mozambican channel (Juan de Nova). Mayotte could be used as logistics support for oil and gas extraction in the Channel, and the Longoni port management authorities are investigating this potential within the port development.

⁽⁸¹⁾ See EUROSTAT definition: http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Energy_dependency_rate.

⁽⁸²⁾ Observatory of Energy, Réunion, <http://energies-reunion.com/wp-content/uploads/2016/07/BER-Grand-Public-2015-BD.pdf>.

⁽⁸³⁾ ADEME, 2015, Etude de potentiel hydrolien à Mayotte. Carried out by Hydro-Gen and Energie de la Lune.

⁽⁸⁴⁾ French overseas territory belonging to the French Antarctic and Austral Territories — TAAF.

⁽⁸⁵⁾ <http://lejournaldemayotte.com/une/du-petrole-aux-eparses-mayotte-aux-premieres-loges-de-la-bataille-de-lor-noir-qui-sannonce/>.

Extraction of salt
<p>Salt extraction from coastal ponds has traditionally been of importance in the South West Indian Ocean, but its high land footprint in areas often preferred for coastal tourist development means that salt ponds are rapidly disappearing, especially in Mauritius, but also in Madagascar, Réunion, Mayotte and Comoros. As regards Mayotte, production may remain artisanal, with a lack of investments to develop industrial production, or because there are conflicts with other activities for new sites.</p> <p>In Réunion, salt extraction occurred at a commercial level in St Leu and in Pierrefonds near the airport of Réunion. The sector is currently marginal, with few professionals being active. Local production cannot meet the Réunion's demand for salt (salt is imported). Increased commercial production with experimental production by solar use is a potential to investigate, although the sector is in competition with other coastal economic activities for land availability.</p>
Desalinisation
<p>Desalination in Mayotte is only for drinkable water production. It is a limited production, with a plant located in Pamandzi on Petite Terre. A second desalination unit is about to be developed by 2019 with public funds to respond partly to severe water shortages at the end of the annual rainy seasons.</p>

1.2.1.9 Main organisations and actors operating in the maritime sector

In this paragraph, the main public and private stakeholders operating in the sea basin and in each OR are given, highlighting for each of them the related role in the relevant policies and maritime activities.

Table 5 – List of main organisations and actors operating in the South West Indian Ocean sea basin

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
Indian Ocean	African Union	Public actor	All maritime sectors	Intergovernmental organisation fostering the development and implementation of Panafrican policies by sectors between its country members.
Indian Ocean	Indian Ocean Commission	Public actor	All maritime sectors	Intergovernmental organisation fostering the development and implementation of Panafrican policies, including blue growth, by sectors between its country members (Indian Ocean countries: Comoros, Madagascar, Mauritius and Seychelles).
Indian Ocean	COMESA — Common Market for Eastern and Southern Africa	Public actor	All maritime sectors	Intergovernmental economic organisation strengthening regional market integration.
Indian Ocean	IORA — Indian Ocean Rim Association	Public actor	All maritime sectors	Intergovernmental economic organisation strengthening regional market integration.
Indian Ocean	SADC — Southern African Development Community	Public actor	All maritime sectors	Intergovernmental organisation. Regional integration of SADC members and poverty eradication in Southern Africa through economic development and ensuring peace and security. 15 Member States: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.
Indian Ocean	UNECA — United Nations Economic Commission for Africa	Public actor	All maritime sectors	Mainstreaming blue economy into national development plans of African countries (see UNECA, 2016. Africa's blue economy: A policy handbook).
Indian Ocean	'Conseil maritime ultramarin du bassin sud océan Indien'	Public actor	All maritime sectors	French council in charge of monitoring and coordinating French blue growth public policy in the Indian Ocean.
Indian Ocean	Indian Ocean Tuna Commission (IOTC)	Public actor	Fisheries	Regional fisheries management organisation (RFMO) — management of tunas and fish associated with tuna catches in the Indian Ocean on behalf of its contracting parties.

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
Indian Ocean	SIOFA — South Indian Ocean Fisheries Agreement	Public actor	Fisheries	RFMO managing fish stocks in the high seas (excluding tuna and associated species managed by IOTC) Members: Australia, Comoros, Cook Islands, European Union, France, Japan, Republic of Korea, Mauritius, Seychelles. Headquarters in Réunion.
Indian Ocean	Ifremer	Public actor	Fisheries and aquaculture	French Marine Research Institute involved in marine research and fisheries research (including data collection on fishing activities in French territories and of EU French flagged vessels in the Indian Ocean).
Indian Ocean	PMAESA — Port Management Association of Eastern and Southern Africa	Public actor	Ports	Non-profit, inter-governmental organisation made up of Port Operators, Government Line Ministries, Logistics and Maritime Service Providers and other port and shipping stakeholders from the Eastern, Western and Southern African and Indian Ocean regions. Note: France, Réunion and Mayotte are not members.
	Association of Ports of the Indian Ocean Islands (APIOI)	Public actor	Ports	The aim of the association is to provide a basic platform for member countries - through cooperation, collaboration, competition, dialogue/information sharing and, to some extent, specialisation - to face mounting challenges regionally and internationally in the liner shipping, cargo transportation, handling and other maritime/port-related industries. Port authorities of Madagascar, Mauritius, Mayotte, Réunion and Seychelles are all members
Indian Ocean	Cruise Indian Ocean Association	Private-public actors	Cruise tourism	Promoting cruise tourism in the Indian Ocean. Executive committee of the CIOA: Kenya, Tanzania, South Africa, Mauritius, Réunion Island (France). Note: Countries are represented by port authorities and their tourism bodies within this regional circuit.
Réunion	Préfecture (représentation locale de l'État)	Public actor	All maritime sectors	Representation of the French State in Réunion, in charge of coordinating the national blue economy strategy in the French territories.
Indian Ocean	DMSOI — Direction de la Mer Sud océan Indien	Public actor	Fisheries (and sea basin maritime surveillance and safety in general)	DMSOI's global missions:
	French Maritime Directorate in the southern Indian Ocean			<ul style="list-style-type: none"> Maritime surveillance and maritime safety a) in the sea basin on behalf of France and other countries in the Indian Ocean and b) in the Indian Ocean French territories; Participation in implementation of the sea and coastal national strategy in the French territories in the Indian Ocean within an integrated regulatory approach between the different maritime sectors based on the French blue book in the Indian Ocean Its headquarters are in Réunion (France).
France	AFD — Agence française de développement	Public actor	All maritime sectors	French development agency (all sectors) working in French overseas territories and less developed countries with offices in different locations in the sea basin, including in Réunion and Mayotte.
France	Conseil régional	Public actor	All maritime sectors	Development of the 'Réunion' Region, in particular with EU regional funds. Representing the French Region (elected officials).
Réunion	Conseil départemental	Public actor	All maritime sectors	Representing the department of Réunion (note: Réunion is both a French department and a

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
	(former name Conseil général before 2015)			region).
Réunion	Cluster maritime français de la Réunion	Private actor	All maritime sectors	Maritime Cluster in Réunion, promoting the Réunionese maritime sector.
Réunion	Temergie	Private actor	Marine renewable energy	Cluster representing renewable energy companies in Réunion.
Réunion	Qualitropic	Private actor	Blue biotechnology	Cluster on tropical bioeconomy (including blue biotechnology).
Mayotte	Préfecture de Mayotte	Public actor	All maritime sectors	Representation of the French State in Mayotte.
Mayotte	Conseil départemental (named Conseil général before 2015)	Public actor	All maritime sectors	In charge of the public development strategy in Mayotte in collaboration with the Préfecture (absence of a Regional Council in Mayotte).
France	INSEE — Institut national des statistiques économiques	Public actor	All maritime sectors	Statistical data collection and analysis on behalf of the INSEE, has a regional office in Réunion with a sub-office in Mayotte.

1.2.2 Identification of most important maritime activities

Maritime-based economic activities contribute significantly to the overall economy of the South West Indian Ocean. Of these, **coastal tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** play a major role in the overall sea basin economy, given that (i) all these activities have been identified in all countries and ORs and (ii) they present the highest development level in almost all territories.

Since quantitative data for maritime activities are not uniformly available in all territories composing the sea basin, the following table analyses the intensity of each maritime activity in each territory of the South West Indian Ocean.

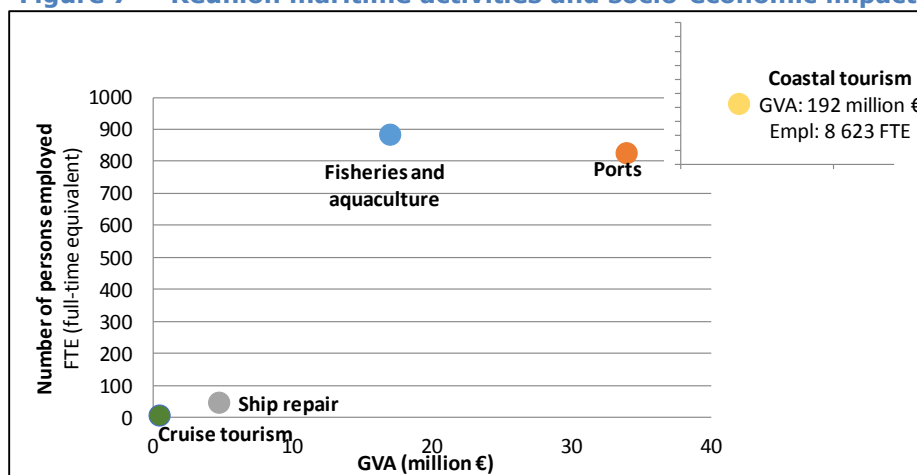
Table 6 – Map of maritime activities identified in the South West Indian Ocean sea basin

Group	Sectors	Réunion	Mayotte	Madagascar	Seychelles	Mauritius	Comoros
Living resources	Fisheries and aquaculture	XX	XX	XX	XXX	XXX	XX
	Blue biotechnology	X (m)				X	
	Extraction of oil and gas			X			
Non-living resources	Extraction of salt	X (m)	X (m)	X		X (m)	X (m)
	Desalination		X (m)		XX	XX	
Shipping	Maritime transport	XXX	XX	XX	XX	XXX	X
	Ports (including dredging)	XXX	XX	XX	XXX	XXX	X
Shipbuilding	Shipbuilding			X		XX	
	Ship repair	X (m)		X		XX	
Tourism	Coastal tourism	XX	X	X	XX	XXX	X
	Cruise tourism	X	X	X	X	X	
Marine renewable energy (MRE)	Marine wind energy				X	X (m)	
	Other MREs	X (m)					

Legend		Activity not identified on the territory
	X	Low development of the activity on the territory
	XX	Medium development of the activity on the territory
	XXX	Strong development of the activity on the territory

Looking at the blue economy of each OR, it was seen that three activities have the highest socio-economic impact on local economies (coastal tourism, ports and fisheries and aquaculture), as the charts below show, while **ship repair** proved to be strategic as a satellite activity in support of the development of other sectors.

Figure 7 – Réunion maritime activities and socio-economic impact



Source: our elaboration of INSEE data. 2012 data. Maritime transport and shipbuilding are not included because of confidentiality.

In Réunion, the top three maritime activities with the highest socio-economic impact are coastal tourism, fisheries and aquaculture and ports. Shipbuilding and ship repair plays a marginal role, but is considered strategic for the development of other maritime activities.

Cruise tourism presents a low value, but is expected to rise in coming years. Furthermore, it does not include effects generated by the activity on satellite businesses.

Table 7 – Mayotte maritime activities and socio-economic importance

Sectors	Mature vs pre-development activity	Social/economic importance
Fisheries and aquaculture	Mature but in difficulty	Importance in terms of employment, although the sector is not highly profitable.
Extraction of salt	Pre-development (marginal)	Salt extraction is made artisanally by a group of women. Limited importance in terms of value added.
Desalination	Pre-development (marginal)	Limited, with only one plant working.
Maritime transport	Mature	Important for daily workforce flows between the two islands
Ports (including dredging)	Mature	Important in terms of employment (4 % growth per year of the Longoni Port activities mainly due to population increase in Mayotte).
Ship repair	Pre-development	Low at present, but with high potential.
Coastal tourism	Mature	Important, registering increases of tourists and their length of stay.
Cruise tourism	Pre-development (marginal)	Very low, with very few stops in a year time.

Source: our elaboration on the basis of analysis and interviews carried out in Mayotte

Data on GVA, employment and turnover were not available for Mayotte. For this reason, alternative information has been used for filling this gap. For more details on methods used, see chapter 1 of Annex 5.

Looking also at future potential in terms of the creation of job opportunities and value added, these four activities showed important potential, considering that at present they constitute the backbone of the local economies in all South West Indian Ocean territories. On the other hand, three activities at a pre-development stage showed a remarkable growth potential in the near future, and could create important job opportunities and value added to the sea basin economy, i.e. **cruise tourism**, **renewable energy** and **blue biotechnology**.

1.2.3 Findings of the needs analysis and best practices survey

The purpose of this paragraph is to report, for the most important identified maritime activities, the main findings of the **analysis of synergies and conflicts** between maritime activities. Furthermore, the main results of the **gap analysis** for the most important maritime activities will be also reported at sea basin level and for each OR, classifying them as 'legislative', 'non-legislative' and 'financial'.

At the end of the paragraph, **key best practices and flagship projects** have been also reported for all activities, selecting them from the Annexes.

1.2.3.1 Fisheries and aquaculture

- **Main results from 'Synergies & conflicts' analysis**

At **sea basin level**, the sustainable and integrated development of the fishery sector could be a key driver for port development and onshore processing, and shipbuilding and ship repair could also benefit from the development of the fishery sector, especially in Mauritius and Seychelles for tuna fishing. Specifically in **ORs**, potential synergies have been identified between the fishery and tourism sectors, since the development of practices such as pesca-tourism could support investments in the sector. Synergies have also been identified with protection of the marine environment and maritime surveillance against piracy and illegal fishing. Another potential synergy has been identified with blue biotechnology, since it would allow the use of by-products originating from the fishery sector. No major conflicts have been identified.

- **Main results from the Gap analysis**

In the **South West Indian Ocean** sea basin, the analysis highlighted a number of **non-legislative gaps**. First of all, small-scale fishermen lack the skills to run business more efficiently and to diversify their fishing activities. Furthermore, in the sea basin, there is a low level of weak knowledge of fish stocks exploited by small-scale fisheries (including tuna-associated species caught by artisanal fishermen in the sea basin) and non-tuna fish stocks in general. Furthermore, fishing activities proved to be unattractive for young people in the entire sea basin. Also, local specialist skills for stock husbandry, hatchery operation, farm management and veterinary skills are scarce or absent, and there is a limited local capacity for research into environmental carrying capacity needs and the impact of aquaculture development on the local marine environment.

Non-legislative gaps have been identified in **Mayotte**. Unfair market competition was detected between informal ⁽⁸⁶⁾ boats and similar boats complying with safety standards. Informal boats do not meet safety standards, and should be upgraded not only to improve working conditions on board, but also to cancel the competitive advantage they have compared to 'formal boats'. The qualifications of fishermen proved to be insufficient in terms of understanding business management, fisheries management and safety at sea. Furthermore, it should be considered that tuna longliners have a limited range of operation, limiting fishing opportunities and therefore the profitability of the activity. As regards aquaculture, technicians are not available in Mayotte. They are recruited from expatriates who do not stay in Mayotte

⁽⁸⁶⁾ The term is used locally to distinguish boats complying with the safety standards and those that ought to meet them.

in the long term. From a **financial** point of view, there is a lack of private investments to modernise the longline fishing fleet.

The same **financial gap** has been detected in **Réunion**, considering that the industrial fishing fleet is ageing. There is a risk of the industrial fishing sector disappearing in the medium term or relocating to neighbouring countries, such as Madagascar. **Non-legislative** gaps have also been identified. The first regards the professional skills of fishermen, who lack the practical knowledge to implement safety at sea rules, business management skills and basic fishery management practices. Furthermore, there is a lack of newcomers in the sector to replace the ageing 'workforce'. The reduced attractiveness of the sector thus limits generational turnover.

1.2.3.2 Coastal tourism

- **Main results from 'Synergies & conflicts' analysis**

At present, synergies between coastal tourism and other activities have not been identified. On the other hand, potential synergies could emerge with fisheries, through the development of pesca-tourism (ecotourism and cruise tourism), and also with environment protection (which is not actually an economic activity), considering that protected areas could be one of the elements making up the tourism offer of any territory in the area. The same synergies have been found at sea basin and at OR levels. No major conflicts were identified.

- **Main results from the Gap analysis**

In the **South West Indian Ocean**, a number of **non-legislative gaps** emerged hindering the development of coastal tourism. First of all, there is a lack of good infrastructure such as roads, energy, and accommodation in rural areas, especially in some territories such as Madagascar, Mayotte, and Comoros. Consequently, infrastructure enabling tourists to visit attractive sites outside main towns is also lacking. Furthermore, staff skills are limited: there is a poor knowledge of internationally used languages in tourism, mainly but not exclusively English (especially in Réunion and Mayotte) and training resources are not diversified enough to respond to the growing need of quality workers in the sector (e.g. in Mauritius). In general, the tourism offer in the area is very scattered and fragmented, and no coordination exists at national and sea basin levels.

Beyond the gaps identified above at sea basin level, which are also valid for both ORs, **Mayotte** presents overall weak qualities and a lack of diversity of accommodation and related locations, since accommodation facilities are usually in the main towns. As regards **Réunion**, there is insufficient protection against shark attacks for nautical activities. While attacks happened mostly when and where people ignored warning signs and the warnings of locals, the reasons for these increasing attacks are not fully understood. Recent research considered that they were likely due to the presence of brackish water areas around the coast of Réunion, which attract sharks during their reproduction cycle (for nursing) and starving sharks reaching these nursery areas after their long migration (see Annex 'Mayotte' for more details). Understanding shark attacks is therefore another key step to preventing the conditions that may cause these attacks.

1.2.3.3 Cruise tourism

- **Main results from 'Synergies & conflicts' analysis**

In the **South West Indian Ocean sea basin**, synergies between coastal tourism supply and cruise tourism demand is very strong, considering that (apart from accommodation) cruisers are interested in the same attractions made available to tourists. On the other hand, considering the limited size of territories in the sea basin, and especially of their ports, conflicts between different port users emerge (fisheries, shipbuilding, ship repair, etc.), which need to be managed to allow a harmonic development of the sector.

Similar barriers have been identified in **Mayotte** and **Réunion**. Maritime sectors using port services (quays), in particular maritime transport, ought to cooperate or to agree on mechanisms with port management authorities to develop the port with the minimum level of conflicts. In Mayotte, the project to develop the Longoni port may reduce this conflict for users in the future. In the short term, solutions need to be found by port management authorities with port users for cruise tourism to be allowed to expand without any barrier for growth.

- **Main results from the Gap analysis**

In general, in the entire sea basin, port infrastructures presented some gaps (**non-legislative gaps**) in meeting the growing demand for cruise tourism in the sea basin. Furthermore, there is still a weak integrated approach of developing coastal and cruise tourism and adopting a holistic vision of cruise tourism in the entire sea basin.

Adequate infrastructures were also lacking in **Mayotte** and **Réunion (non-legislative gap)**. While the situation is about to change with the second development phase of the Longoni Port (Mayotte) with public support, Réunion is still lacking space at the port to sustain a harmonious development of cruise tourism. Furthermore, the gap analysis identified a lack of communication to cruise tourists regarding available leisure activities in Réunion. There is also a trend that cruise tourists book activities with the tour operators of the ship (the cruise tourists buying 'activity packages') reducing the use of a local workforce where the ship stops. There is therefore a need to attract tourists in carrying out land activities coordinated by or with the support of local tourism offices to increase local economic benefits.

Finally, in Réunion there is a lack of integrated development of the workforce within the entire supply chain of the tourism economy to favour a sustainable development of cruise tourism. No links between education systems and the industry have been found.

1.2.3.4 Shipping

- **Main results from 'Synergies & conflicts' analysis**

While synergies between ports and maritime transport, cruise and coastal tourism and the fishery sector represent the backbone of the blue economy, conflicts between ports and coastal tourism have been identified, since the former can impinge the latter in terms of use of space. This conflict is rather frequent in places where spaces are limited, for instance in all territories included in the sea basin (excepted Madagascar). Areas should be managed carefully to ensure sustainable and harmonic development of activities sharing the same areas.

No specific major conflicts or synergies have been identified in **Mayotte** and **Réunion** between ports and maritime transport and other activities.

- **Main results from the Gap analysis**

At a regional level, although some ports were seen to be highly specialised as transshipment hubs, there is still weak regional short sea shipping (**non-legislative gap**) to facilitate exchanges between sea basin countries. In general, in all countries of the South West Indian Ocean, maritime transport has only limited generational turnover, especially if the activity requires long periods spent away from home. In Comoros and Madagascar, poor infrastructure facilities have been detected.

In **Mayotte**, port infrastructures are being developed to respond to natural demand caused by demographic growth, to finally meet the full potential of the sector. On the other hand, as highlighted by Mayotte Channel Gateway, Mayotte became an EU outermost region only recently, requiring the adaptation of port infrastructures under EU and national norms (**legislative gap**). This is slowing down the rapid development of the Longoni port. Furthermore, considering that Mayotte has to hire trainers from abroad, non-EU citizen trainers required by the Port Management Authority of Longoni

to train staff are having difficulties entering Mayotte easily due to strict visa requirements ⁽⁸⁷⁾.

As regards **Réunion**, the main gap identified is the lack of local specialists on the environmental impact of tropical ports. Indeed, there is a weak understanding of environmental impact in the upstream phase of development of ports projects and of the specific nature of the tropical location of Réunion (for instance regarding the natural contents of sediments, such as the natural nickel content of soil in Réunion). Related research on the environmental impact of tropical ports is required, which should take into account this local specificity.

1.2.3.5 Shipbuilding and ship repair

- **Main results from 'Synergies & conflicts' analysis**

Shipbuilding and ship repair can provide important services to other maritime activities, and therefore synergies exist and can be considered as 'pivotal' for the sustainable development of other sectors (e.g. fishery, transport, yachting, etc.). Conflicts can emerge regarding the management of spaces, since ship repair activities also require some equipped areas in the port (e.g. dry docks), overlapping with other activities. Similar synergies and conflicts can be found in Mayotte and Réunion too, although this activity in both islands is rather limited.

- **Main results from the Gap analysis**

Looking at the activity from a **sea basin** point of view, it is impossible for a local shipbuilding activity to compete with Asia and South Africa, due to the limited population pool and the need to import all raw materials for shipbuilding (**non-legislative gap**). Furthermore, the high costs of work are a hindrance to heavy ship repair services development in **Réunion** and **Mayotte** compared to neighbouring countries, leading potential demand for services to look for more competitive offers. In addition to infrastructural gaps regarding repair activities, in Réunion, leisure yachting repair is currently carried out by craftsmen. In general, there is a low level of professionalism of the leisure yachting repair sector.

1.2.3.6 Blue biotechnology

- **Main results from 'Synergies & conflicts' analysis**

Blue biotechnology is still a pre-development sector in the sea basin and in Réunion; however, potential synergies with the fisheries and aquaculture sector and marine renewable energies could be created, since the sector could make use of fisheries and aquaculture resources and deep-sea water pumped by SWAC technologies for its biotechnology applications (energy sources, cosmetics, etc.). Local research institutes studying these subjects are the CYROI and the cluster Qualitropic ⁽⁸⁸⁾.

- **Main results from the Gap analysis**

As regards **Réunion** in particular, the gap analysis revealed the lack of a robust tool to transfer and share knowledge, innovation ideas and information between the different sectors (aquaculture, R&D, industry). Organisations already exist (a maritime cluster, a specific cluster, Qualitropic, etc.). The development of a maritime research pole should be investigated, based on proposals initially drafted with the support of the Regional Council. Furthermore, collaboration with the private sector is scarce, and should be improved, considering the availability of funds that this sector may have and the capacity to attract investments.

⁽⁸⁷⁾ Mayotte Channel Gateway, comm., October 2016.

⁽⁸⁸⁾ See § 2.1.6.

1.2.3.7 Marine renewable energies

- **Main results from 'Synergies & conflicts' analysis**

Although the sector is not developed in the sea basin and in Mayotte, and marginally existing in Réunion, conflicts may occur with maritime activities located near or in the area where marine renewable energy installations are located (for instance with trawl fisheries).

- **Main results from the Gap analysis**

The gap analysis carried out on Réunion's marine renewable energies remarked the lack of local skilled human resources. In fact, since it is a new sector, local technical human resources mastering renewable energies (and especially marine) technologies are not present. Furthermore, the technologies available (those existing and originating from other experiences) are not adapted to cyclonic conditions causing marine renewable energies systems to fail. However, such conditions are an asset for R&D, for experimental research in difficult environmental conditions.

1.2.3.8 Main best practices and flagship projects surveyed

In this paragraph, main best practices and flagship projects surveyed in each OR and at sea basin level are reported. More details are available in chapter 3 of Annexes 5, 6 and 11.

1. **ORs concerned:** sea basin level.

Name of the practice: regional conference on blue growth organised by the Indian Ocean Commission — IOC⁽⁸⁹⁾ (under the Presidency of France in 2016).

Objectives: development of regional cooperation for blue growth in the Indian Ocean sea basin.

Maritime activities concerned: All.

Results achieved: preparation and organisation of the conference on 12-13 December 2016 in St Denis (Réunion) by the Préfecture and the Conseil Régional of Réunion which enabled the drafting of 30 recommendations as background to a regional strategy expected to be submitted to the IOC by the end of the first semester of 2017. Recommendations included:

- Collaboration between the IOC⁽⁸⁹⁾ and the UN Economic Commission for Africa (UNECA) to use the initiative of the IOC blue economy as an emblematic programme of sub-regional coordination for the UN agency;
- Dissemination to Member States of the practical guide on the blue economy published by UNECA in April 2016 (see 6.1 in Annex 11 for further details);
- Support for the 'whale road' project coordinated by the Regional Council of Réunion and as well as actions to enhance the ecotourism potential of the sea basin, possessing an exceptional biodiversity, although threatened and requiring protection;
- The exchange of data, expertise and lessons learned in the fields of renewable energy and ecosystem management;
- The strengthening of port capacity for the improvement of trade and the development of new activities, including growing cruise tourism;
- The continuation and amplification of IOC actions for regional connectivity, including sea and air plans;
- The effective involvement of IOC and its member countries in the project to combat the trafficking of natural assets (flora and fauna) with funding from the 11th European Development Fund.

⁽⁸⁹⁾ The IOC is an intergovernmental organisation that consists of five African Indian Ocean nations: Réunion (as an overseas region of France), Comoros, Madagascar, Mauritius and Seychelles. The organisation is involved in a collaborative development of the Indian-Ocean space as a framework of regional integration and cooperation of the Member States between each other and with other partners (see <http://commissionoceanindien.org/a-propos/qui-sommes-nous/>).

Reasons for considering it as best practice or flagship project: the activity is a milestone within a cascade of EU and French initiatives to implement sea basin strategies for blue growth since 2007 ⁽⁹⁰⁾. In particular, it carries on from the IOC note to prepare this conference with EU funding ('élaboration d'une note conceptuelle en vue de l'organisation d'une conférence régionale sur l'économie bleue'). Also, the cascade of initiatives could be duplicated in other sea basins.

2. **ORs concerned:** Réunion.

Name of the project: Project 'Pôle industriel Bois Rouge', St André.

Objectives: Development of an environmentally friendly port hub as a complement to the Port Est of the Grand Port Maritime de la Réunion for container transshipment.

Maritime activities concerned: Cross-sectoral project.

Results achieved: To date, drafting of feasibility project documents.

Reasons for considering it as best practice: development of an environmentally friendly port hub as a complement to Port Est for container transshipment. The construction of this port is expected to contribute to the sustainable blue growth of the OR within an integrated approach of maritime activities on this new port site. The project, if going forward, could provide experience in developing eco-ports within other sea basins, and is an initiative that is relevant for the development of the blue economy in Réunion. For instance, the port site as a web of shipping activities intertwined with renewable energy activities, waste product valorisation plants, education and IT activities.

3. **ORs concerned:** Réunion.

Name of the project: SWAC project in the Réunion territory of the Communauté intercommunale du Nord de La Réunion (CINOR).

Objectives: to reduce dependency on fossil energy sources (marine renewable energy).

Maritime activities concerned: Marine renewable energies.

Results achieved: to date: drafting of feasibility study documents.

Reasons for considering it as best practice or flagship project: new project in the sector using seawater air conditioning technology based on experience gained in previous similar projects in Réunion. The initiative is of interest, demonstrating that some marine renewable energies technologies in Réunion (and Mayotte) have commercial potential, while others tried in recent years have less potential due to extreme weather conditions and still non-adapted or non-mastered technologies under these conditions.

1.2.4 Findings concerning most relevant drivers and growth barriers

In this paragraph, the main findings of the analysis of 'Growth drivers and barriers' for the most important maritime activities are reported, classifying them as 'legislative', 'non-legislative' and 'financial'.

1.2.4.1 Fisheries and aquaculture

Legislative drivers have been identified that could support the sustainable development of the fishery sector in the South West Indian Ocean. The first is tuna fisheries management through the Indian Ocean Tuna Commission (IOTC). The existence of internationally binding conservation and management measures should improve sustainable tuna fishing in the area. Another legislative driver is the fact that EU public funding does not allow the building of new EU fishing vessels. This approach,

⁽⁹⁰⁾ That is since the Commission proposal of an integrated maritime policy ([COM \(2007\) 0575](#)). See in Annex 6 section 3 item 1 for the related French initiatives: from a national blue book for blue growth in 2009 to the development of sea basin maritime councils in 2016 complemented by a national strategy for the sea and the coasts in February 2017.

bound within the EU the Common Fisheries Policy, is designed to avoid heavy public subsidies to artificially sustain the sector. This measure could reduce overcapacity and overfishing and favour sustainable fishing where the EU fleets operate. An additional driver is the obligation of vessels catching toothfish and associated species in French Antarctic and Austral Territories to land in Réunion. A **non-legislative** driver which could sustain the development of the fishery sector is the broad availability of good infrastructures for tuna landing and processing (especially in Seychelles and Mauritius, but also Madagascar) and for toothfish and associated species in Réunion. Furthermore, fisheries training and research centres are available in the sea basin, especially in Réunion and South Africa, smaller research centres in other sea basin States.

Nevertheless, important **legislative barriers** that could hinder the development of the sector in the area (or hinder some countries) include the risk of unfair competition between countries if fleet development rules and fishing management rules are different among fishing States targeting the same fish stocks. At a local level, specific rules (management of spaces) are needed to avoid conflicts with other maritime activities sharing the same areas (e.g. ports). Again on the subject of the fishery sector, a **non-legislative barrier** is the lack of knowledge in terms of stock status, in particular for non-tuna species and stocks exploited by small-scale fisheries. As regards aquaculture, the distance of the sea basin from high value markets impacts the development of large scale marine aquaculture production, especially considering that the cost of cyclonic-resistant infrastructures to farm marine fish in the open sea is very high.

As regards **Mayotte**, the analysis of growth drivers and barriers highlighted several **non-legislative drivers** that could sustain the development of the fishery sector. First of all, Mayotte is located along the tuna migration road or near tuna fishing grounds in the Indian Ocean sea basin, creating a competitive advantage for sustainably exploiting this resource. Furthermore, the support of French research institutes from Réunion and mainland France could further bolster the development of the sector. However, a better knowledge of the fisheries stocks and fishing activities in Mayotte is necessary to improve their management.

As regards aquaculture, the main **non-legislative driver** is the interest of a local operator in trying to re-launch the local red drum aquaculture by managing the red drum hatchery on behalf of the local public authorities. Nonetheless, staff needed to technically operate the hatchery will have to be recruited externally. Generally speaking, hatchery production is poor, and needs to be rebuilt.

The analysis also highlighted **legislative barriers** to growth of the fishery sector, mainly the unfair competition between small fishing boats conforming to EU safety standards and similar boats not conforming. Furthermore, as underlined by local stakeholders in Mayotte requesting the application of an exclusivity zone based on the CFP, the fisheries agreement between the EU, representing Mayotte, and Seychelles, authorises Seychelles tuna fishing vessels to operate in Mayotte waters, hindering possible development of the activity in Mayotte. **Non-legislative barriers** identified concerned the fact that business and accountability skills of small scale fishermen are poor. Furthermore, the lack of local terrestrial infrastructures to process tuna caught in the sea basin represent a barrier that is difficult to challenge due to the competitive and mature development of tuna processing facilities within the sea basin (Seychelles, Mauritius and Madagascar). In this regard, the weak **financial** capacity of local operators for developing a local longline fishing fleet is one of the main barriers identified.

A similar **financial barrier** has been pinpointed in **Réunion**, where financial incentives and heavy investments are required to sustain the local fleet, which is ageing and in competition with other operators based in neighbouring countries. As reported by local public and private stakeholders, the rules of the EMFF and CFP, not authorising the co-funding of shipbuilding, create a further limit (**legislative barrier**)

to the development of the sector, especially taking into account the specificity of the OR.

A **non-legislative barrier** is the average age of active fishermen and the difficulty in renewing the workforce. On the other hand, the Réunion toothfish industry could be an important driver for attracting new resources and young people. Furthermore, the presence of research institutes undertaking fisheries and marine research in Réunion (the French Research Institute for Exploitation of the Sea — Ifremer and the Institute of Research for Development — IRD) could be an additional boost to fishery development (**non-legislative driver**), exploring new possibilities in tuna fishing. Research could also support aquaculture, which may also benefit from the availability of red drum larvae and technical knowledge for the hatchery industry. From a **financial** point of view, the EMFF supports red drum production (hatchery) and helps to diversify production to other marine and freshwater species.

On the other hand, a competing red drum production based in Mauritius could undermine the development of aquaculture in Réunion (**non-legislative barrier**). Moreover, the low availability of local workforce skilled in marine aquaculture and low labour market attractiveness could hinder the further expansion of the sector, considering also that there is a lack of natural protected areas against cyclonic conditions.

1.2.4.2 Coastal tourism

Coastal tourism in the **South West Indian Ocean** could be boosted by the presence of tourism boards in several countries which foster development of the sector with public support (**non-legislative driver**). The most important **non-legislative barrier** is the logistics to reach the sea basin. Compared to other sea basins with similar attractiveness, transportation costs from the main markets of origin of tourists to these Indian Ocean destinations are prohibitive and exclusive.

Specifically, as regards **Mayotte**, coastal tourism could significantly be boosted (**legislative drivers**) by exploiting the exceptional marine biodiversity and its protective regulations ('Parc marin de Mayotte'), which could also contribute to the development of ecotourism. To this end, a young population, even one with low skills, could be educated and trained to respond to demand in the sector, especially of this type. On the other hand, tourism growth in Mayotte could be hindered by the high costs of flights to reach the destination, and by the lack of adequate accommodation offer, in terms of personnel and structures (**non-legislative barrier**). From a **financial** point of view, small-medium enterprises have low financial capacity to modernise their offer. This barrier does not help the sector to upgrade its offer to higher standards.

The analysis of growth drivers and barriers also revealed important **non-legislative drivers in Réunion** which could support the development of the sector. The first is the insular situation, with a rich marine and terrestrial biodiversity for coastal tourism activities combined with non-coastal activities in Réunion. The OR also has a noteworthy offer of ports for the development of yachting activities. On the other hand, the lack of an integrated approach (**non-legislative barrier**) for the development of tourism has so far hindered the maximisation of these drivers.

As regards both Mayotte and Réunion, the lack of an adequate workforce with even basic language knowledge (i.e. English mostly) represents an important barrier to the development of the sector, especially in view of the overall objective of attracting international flows from main markets (Russia, China, etc.). No links between the industry and the educational system have been observed, hindering the creation of adequate resources for meeting the demand for skilled professionalism in the sector.

1.2.4.3 Cruise tourism

At **sea basin level**, there are many (**non-legislative**) drivers pushing operators to invest in this area, one of which is the complementarity of landscapes and

biodiversity, which could offer competitive cruise packages. Furthermore, in EU ORs, the presence of health services and waste management at ports in compliance with international standards (EU standards) is an asset for cruise agencies and for international tourism at the sea basin level. On the other hand, some barriers have been identified, among which the most relevant is the need to adapt quay infrastructure and ancillary services to cruise ships in ports in the sea basin. This barrier has been identified most of all in **Mayotte** and **Réunion**, where current port infrastructures do not allow the adequate management of cruise vessels, and the provision of services to tourists on land. However, in Mayotte, a strategy adopted at a local level aims to develop cruise tourism to increase local employment and value added for the Mayotte economy. The Longoni port management authority (MCG) considers cruise tourism to be one of the main segments that needs to be improved in the near future.

1.2.4.4 Shipping

As mentioned in § 2.1, the entire **sea basin** — and some areas in particular — is located in an advantageous position along the main maritime routes of freight goods from Asia to Africa and the Middle East. This important **non-legislative driver** could further support the development of the area as a transshipment hub in international transport networks. Overall public engagement to support the development of the port system has been detected, but weak coordination among ports in the area could limit the development of the sector, as it generates competition instead of complementarities (especially in the role of transshipment).

With regard to **Mayotte** in particular, although significant investments have been undertaken and more are planned to modernise the port of Longoni, the activity is strongly jeopardised by the **limited financial** capacity to support investments or attract additional investments to consolidate the Longoni port project as a regional hub. To this end, it should be noted that the Longoni port still has to be certified by International Ship and Port Facility Safety and Security (ISPS), to be internationally recognised as a safe port.

Réunion is a call along the maritime transport route of goods from Southern Africa to Asia, representing the main **non-legislative driver** for growth of this sector. Grand Port Maritime de la Réunion is ISPS certified. Although expensive compared to other neighbour countries with lower labour standards, the local workforce is available and of quality (recognised as such in the sea basin). There are good growth prospects for the activity in the future thanks to important planned development projects (see § 1.2.5.4 below). On the other hand, the lack of knowledge about the specific soil and tropical conditions hinder the development of ports in Réunion. If necessary and legally possible, the local regulations on environmental impact assessment and monitoring should be adopted, over national regulations.

1.2.4.5 Shipbuilding and ship repair

At **sea basin** level, infrastructure to be dedicated to shipbuilding activities exists in Mauritius, South Africa, Madagascar, for building fishing vessels, patrol vessels, small maritime transport vessels (**non-legislative driver**). Furthermore, there are repair capacities for each type of vessel at sea basin level, although they are not always adequate for repairing all types of vessel or damage. As mentioned above, shipbuilding and repair activities need space for their development, and the lack of these areas in ports hinder the development of the sector (**non-legislative barrier**). It should be noted that the development of specialisations in some territories may generate losses of local skills in the medium term.

In **Mayotte**, the availability of a young workforce to respond to a potential demand for medium-skilled positions for local ship repair services represents an important **driver** to the growth of the activity, even if young people should be trained and attracted by this sector.

In **Réunion**, the advance of the yachting sector might represent an important **non-legislative driver** to the growth of the sector, entailing the development of

specialisation in this repair niche. However, the lack of training structures represents another limit for the development of the sector.

1.2.4.6 Blue biotechnology

One of the main drivers, which could support the development of the sector in the sea basin and especially in **Réunion**, is the availability of funds (from EU and from the Indian Ocean Commission) to support research. On the other hand, Réunion and Mayotte do not currently have the possibility of leading EU calls for proposals on blue growth for the South West Indian Ocean sea basin (**legislative barrier**), since the sea basin is not covered directly by funding possibilities. Current option is for the ORs to respond under a leading organisation working in another sea basin recognised in these calls for proposals, however these leading organisations are based in non-tropical sea basins, with different assets.

In general, skills availability is limited only to Réunion, while resources to be used for this activity are abundant in the entire sea basin.

1.2.4.7 Marine renewable energies

At **sea basin** level, R&D supported by the Indian Ocean Commission is a main **driver** to the growth of the sector, envisaging Réunion as an experimental platform for marine renewable energies. Furthermore, the presence of an internationally renowned laboratory on the atmosphere and cyclones in Réunion (LACY) could drive research in this sector at a regional level (providing the funds required to run more projects are available). On the other hand, the lack of knowledge on situations under extreme weather conditions (characteristics of waves and currents under these conditions) hinder the development of new installations and projects, which should be backed by deep knowledge of weather conditions for each possible installation site. Moreover, there is a lack of highly qualified skills and regional research cooperation in the sea basin.

Looking at **Réunion**, a main **financial** barrier has been identified, namely the lack of large private financial support following several pilot project failures. Nevertheless, some pilot projects using the SWAC technology have been launched or are about to begin. The commercial use of marine renewable energies needs to be further analysed in order to identify possible viable and sustainable business models for locally developing the sector commercially.

1.2.5 Findings on activities with highest potential

In this paragraph, the main findings of the analysis on the potential of the main maritime activities identified are given, assessing for each of them the potential in terms of value added, employment and competitiveness. The detailed analysis is given in chapter 9 of Annexes 5, 6 and 11.

1.2.5.1 Fisheries and aquaculture

Several countries and territories in the **South West Indian Ocean** sea basin have tuna fishing fleet development plans which might have an important impact on employment in local communities. Mauritius, Madagascar and Seychelles are well positioned to continue to benefit the most from large-scale tuna fishing in the sea basin for the purse seine tuna fishing fleet (and Asian longline fleets), landing or transshipping their catch in these three countries. Réunion and Mayotte benefit to some extent from landings of their local fleets. Furthermore, the diversification of wild species caught could generate additional opportunities, although this possibility needs to be better explored. Exponential growth of the processing sector to add value to raw products is not expected, but improving local value added is likely to be an objective of operators catching fish then selling it at a national level within the sea basin.

As regards marine aquaculture, the insular situation of the countries in the sea basin and weather conditions prevents the possibility of developing large-scale aquaculture

and producing low-cost products. Some potential for additional employment could be expected by a steady growth of activity in Mauritius (red drum production).

As for **Réunion**, the key constraint in the sector is competition with other neighbouring countries to catch fish, especially with the likelihood of a quota system being imposed in the future.

To sustain the fishing sector in Réunion, the regional committee for fisheries (CRPMEM) recommends:

- the renewal of the current longliners storing catches fresh on board;
- the development of a frozen longline fishing fleet to increase their radius of operation. The development of such a fleet would be in direct competition with the current EU purse seiners fleet catching tunas, freezing on board and active in the region, but not landing fish in Réunion.

The situation is similar in **Mayotte**, where local stakeholders recommend developing the local longline fishing fleet (a few vessels) to be able to catch tuna further offshore and safely, even if the development of such a fleet would be in direct competition with the current EU purse seiners active in Mayotte.

In Mayotte, the potential of fishery activity should meet the following challenges:

- the inadequacy of the catch and profitability of offshore fishing activity (training of seafarers, type of vessel, fishing gear, etc.);
- strong regulatory constraints on the means of production currently requested, particularly due to delays in the compliance process for the existing fleet (reporting companies, ships and marine; medical traceability, etc.);
- low profitability of the business, limiting opportunities for investment and modernisation;
- difficult conditions in the fishing trade (low wages, harsh working conditions, undeclared work, etc.).

Furthermore, an independent study funded by the EU Parliament ⁽⁹¹⁾ suggested a few measures for fulfilling the potential of the sector, namely:

- a new derogation to fleet management rules established under the CFP when capacity ceilings are not met;
- increase of certain fleet segment capacities for fleet targeting fish stocks without compromising their sustainability;
- Re-organisation of fleet segmentation;
- Increase in aid intensity for operations concerning engine replacement.

As regards aquaculture, local public engagement has been detected in re-launching the sector, locating a suitable local hatchery manager. However, the competitiveness of the sector is linked to the capacity to produce (or import) fingerlings to make them available for local production by meeting a suitable market price for outgrowing producers in the market.

In general, fishery activity in **Réunion and Mayotte**, although not attractive for young people, has a medium job creation potential. In Réunion, local value added would also take advantage of current facilities, the experience of local actors in fishing and selling fish products in local and international markets, and possible new fishing grounds for non-tuna species and for toothfish. Mayotte would benefit from the fishing and trading experience of local actors too.

Also, aquaculture could also generate some positive effects on employment and value added in the medium to long term. The attractiveness of the activity is expected to be

⁽⁹¹⁾ F&S, 2016. Research for PECH Committee — The management of fishing fleets in Outermost Regions. An independent study carried out on behalf of the EU Parliament.
[http://www.europarl.europa.eu/RegData/etudes/STUD/2016/585901/IPOL_STU\(2016\)585901_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/585901/IPOL_STU(2016)585901_EN.pdf).

boosted by identifying new products and markets (spirulina and microalgae) and offering new possibilities to fishermen and young people.

1.2.5.2 Coastal tourism

Coastal tourism provides an important amount of jobs in the **sea basin**. The development of employment and value added is to be expected, as there is still some potential for growth and the professionalisation of the sector. Security and safety issues in countries (sharks, but also piracy) has had a negative impact on attracting tourists, and travelling to the sea basin is still costly compared to other destinations with similar geographic conditions. This limits the fulfilment of growth potential of coastal tourism in the area.

More in general, coastal tourism in the sea basin could be the real driving force for the improvement of local economies, especially in ORs that might benefit from the consolidated positions of some countries in the area (Seychelles, Mauritius) in the international tourism market. To achieve this objective, the development of coastal tourism requires investments for increasing services provided and developing a wide range of activities, more or less connected with the maritime sector, but always aimed at meeting growing demand from tourists.

Coastal tourism could also have an impact on the **Mayotte** economy, both in terms of creating new jobs and value added. 'Attractiveness' is based on its environmental heritage, providing a diversified supply of assets within the sub-basin. It could be possible to achieve this objective only with a big effort on environmental protection and hosting capacities.

The volcanic landscape of **Réunion** is an exceptional asset for the development of coastal tourism. The OR should find its place within the sea basin and aim for the high end of the market by diversifying and being complementary to its neighbours' offer. Among coastal tourism activities, leisure yachting has the most interesting potential, considering the assets currently owned by Réunion in terms of ports and the potential increasing demand for yachting and sailing services.

More than generating direct employment and value added, the development of coastal tourism in both ORs could imply the creation of multiple benefits stemming from other activities (spillover effect).

1.2.5.3 Cruise tourism

The sector in the **South West Indian Ocean** (including ORs) has a great growth potential, and international cruise companies are increasingly willing to invest in this area. However, a valid offer should be structured in order to appropriately meet cruisers' needs. This objective could be achieved only by increasing cooperation among islands of the sea basin and drafting a diversified and complementary offer to cruise companies.

Looking at **Mayotte** and **Réunion**, the competitiveness of the sector largely depends on the attractiveness of private investments based on suitable port infrastructures and the enhancement of environmental assets. The latter should be aimed at extending cruiser stops on land and incentivising cruisers to increase the expenditure level. The incentives should be based on providing a diverse and complementary offer of local tourism activities adapted to the territories (e.g. ecotourism in Mayotte) combined with good health services (cruise ships need health services in the sea basin, which are of good quality in both of these territories).

As regards Réunion, around 50 000 cruise tourists are expected in 2020/2025. To reach such a level, actions must be coordinated with the public harbour authorities, the Grand Port Maritime in Réunion⁽⁹²⁾, to enhance cruise boat capacity, and with local tourism and transport sectors.

(92) Ports de France – presentation : <http://www.port.fr/article/presentation-des-ports-francais>.

1.2.5.4 Shipping

At **sea basin** level, maritime transport has a good potential in terms of job creation if the growth of the population is confirmed, and if transshipment activities continue to be further refined (e.g. by achieving complementarities) using these ports for major companies' transport purposes. However, part of the crew employed in maritime transport is recruited outside the sea basin. The potential for local employment could increase by incentivising maritime transport companies to recruit seamen located in the basin. The value added that the activities (ports and maritime transport) might generate are obviously important, considering they are used for feeding internal markets with imports, and maritime transport is the main trade channel for exporting goods from the sea basin.

Looking at ORs, the potential for raising the competitiveness of port systems at an international level is high, also considering the support provided by EU and French funding to develop infrastructures. With regard to **Réunion** in particular, the 'Bois Rouge' project on the eastern coast of the Island includes a new sea port infrastructure supplied with LNG. Port facilities are to be dedicated to bulk carriers and ro-ro ships and LNG delivery. The project is an opportunity to develop marine thermal energy and blue technologies (cosmetics and medicine), the sugar industry, waste valorisation, a data centre and an engineering school unit. The global cost is estimated at EUR 1 billion, with a full exploitation capacity in 2025 and 2,500 new direct jobs. Financial support from the EU 'Juncker plan' is expected to be requested. Another project in Réunion, the '80 ha area' (a free trade zone) is planned to add value to imported products landing in Réunion for re-export.

In **Mayotte**, the development of maritime transport is expected to generate an impact on employment and value added, especially through the expansion of short sea shipping to reduce traffic on terrestrial roads and through the successful development of the Longoni port as a regional hub. The Longoni port shows some potential in becoming a robust regional hub for goods transported by sea in the north of the Mozambique Channel and by attracting possible port activities related to oil and fuel extraction. The latter activities would require rigorous environmental impact management in their development.

1.2.5.5 Shipbuilding and ship repair

At **sea basin** level, the potential impact of this activity in terms of job creation is not so high. It should focus on the construction of fishing vessels, patrol vessels and small transport ships. The most important potential in terms of employment could be represented by the leisure boat segment, although it would face the strong competition of Asian or African markets. For this reason, the shipbuilding sector is not expected to grow substantially in the sea basin. On the other hand, the need to maintain a minimum level of ship repair services in all ports in the sea basin is fundamental for ensuring the development of transport hubs or other forms of maritime transport.

With regard to **Mayotte**, the development of ship repair services is expected in the port development plan of the Longoni port, and may generate some marginal effects on employment by maintaining minimum repair services in the island.

On the contrary, in **Réunion** the growth of port activities and leisure yachting will require minimum local ship repair services that are complementary to heavier ship repair services available in neighbouring countries. Attracting investors and operators will be key to developing the sector in the medium to long term.

1.2.5.6 Blue biotechnology

While the activity is expected to grow in the future, at least in Réunion as leading actor in the sea basin, the impact on local employment (high-skilled jobs) at **sea basin** level should not be so large compared to maritime sectors like tourism, fisheries and ports. On the other hand, in the long term, the development of blue biotechnology

on a large scale could generate indirect employment in other sectors, but at this stage it is too premature to assess the concrete potential.

As regards **Réunion**, its potential in this activity is linked to the valorisation of these resources for food production (microalgae culture and aquaculture), care (bioactive substance) or energy (biofuel). Considering the experience already gained in this activity, the OR could act as one of the leading actors in the sea basin for the development of blue biotechnologies in the Indian Ocean.

The potential impact on employment could be much more relevant, considering the advantage that the OR has in terms of research and the marine biodiversity potential of Réunion. However, the competitiveness of the sector — at least with research as it is at present — is linked to its ability to attract private investors.

1.2.5.7 Marine renewable energies

In the short term, marine wind energy has a low potential, due to cyclonic risks in the **sea basin**: the technology is currently not adapted to such conditions for offshore wind farming (with the exception of land reclamation in Mauritius and public engagement in Seychelles). Offshore marine wind farming may have higher potential in the islands' sea basin in the medium term when technology has been developed to build wind farms supporting cyclones and robust maritime spatial planning is in place to avoid conflict among users, including marine biodiversity protection (for instance in Mayotte). In terms of added value, the impact in the short term is expected to be marginal, considering that technologies are developed outside the sea basin and cooperation on research and development is absent (or weak). Some added value might derive from maintenance and repair services for tools and plants, but only in the medium to long term.

In **Réunion** the impact in terms of job creation is low in the medium term (since it is only concentrated in research activity) but could be high if the activity enters a commercial scale of production. The impact for local economies would be considerable, as it would reduce dependency on fossil fuels. Réunion should explore the possibility of developing special plants to be installed in the location under extreme weather conditions. This would increase the competitiveness of research activities in Réunion, which would have a niche market in this emerging segment of the blue economy.

1.2.6 Conclusions on concrete measures by type and timeframe

Following the analysis carried out at sea basin level and in each OR included in the area, the conclusions reported below emerged. Conclusions have been grouped into three sets (legislative, non-legislative and financial), depending on the type of needs and possible intervention measures which might be adopted to fulfil the potential of each activity at sea basin level and in each OR. A possible time frame has been indicated for each conclusion, namely (i) short to medium term, for actions which could require an implementation period of between 0-5 years and (ii) medium to long term, for actions which could require an implementation period of between 5-10 years.

More details on conclusions are available in chapter 14 of Annex 11 and in chapter 13 of Annexes 5 and 6.

1.2.6.1 Cross-sectoral conclusions

Non-legislative conclusions

a) Development of a coherent approach for developing the maritime sectors in the sea basin (i.e. Maritime Cluster and a private-public exchange platform)

Several maritime sectors expressed their concern about the need for a coherent approach to developing the sea basin maritime sector. Also, the EU ORs in the sea basin are French territories only. The development of a sea basin exchange platform

and an EU Maritime Cluster covering the Indian Ocean sea basin could provide support for coordinating development policies in the area.

This action should be coordinated by the Indian Ocean Commission. It should involve local public authorities and stakeholders of the maritime sectors, including among others the 'Conseil maritime ultramarin du bassin Sud océan Indien' ⁽⁹³⁾. It is a short-term action for a long-term approach, whose results (i.e. sea basin clusters) should keep on working in the future.

The following steps should be undertaken:

- a) development of a blue economy platform of exchange at the sea basin level between public and private stakeholders with open public access and restricted access to specific information;
- b) creation of a sea basin network of national maritime clusters;
- c) pilot development of an EU Maritime Cluster based in Réunion with EU stakeholders interested in investing or operating business within the Indian Ocean Sea Basin. Such a cluster could be an EU projected cluster based on the current Maritime Cluster in Réunion.

As best practices of Maritime clusters, the Maritime Clusters in France and the European network of maritime clusters are two possible examples to be followed.

Geographic scope of conclusion: sea basin level

b) Training and education for employment: strengthening collaboration with the industry to respond to ever-changing needs through regular public-private workshops and awareness campaigns

Several maritime sectors demonstrated the need to improve employability by professional training in Mayotte and Réunion and to a wider extent at the sea basin level. Technologies are changing quickly, especially in the blue biotechnology and the marine renewable energy sectors, but not only. It is also important to replace older employees in different maritime sectors.

Continuous input and proactive initiatives from the blue growth industries in preparing and regularly modifying educational programmes supported by the European Structural and Investment Funds is recommended, being crucial to keeping training and curricula up to date to develop the blue economy in the ORs and at the sea basin level to its full potential.

The proposed development of specific clusters, workshops and cooperative awareness campaigns by blue economy industries (directed at local public authorities, schools, and universities) at the OR and sea basin level in annexes 5, 6 and 11 respond to this cross-sectoral measure.

Geographic scope of conclusion: sea basin level, Mayotte and Réunion

1.2.6.2 Fisheries and aquaculture

Legislative conclusions

a) Support for the development of a longline tuna fishing fleet

Mayotte plans to develop a longline tuna fishing fleet (centred around 25 longliners of less than 20 m) to be active in Mayotte waters and beyond.

Local stakeholders request that the commercial and sustainable development of the current and future local fleet registered in Mayotte be met by:

⁽⁹³⁾ French maritime council in the Indian Ocean Sea Basin created in 2016 under the joint presidency of Réunion, Mayotte and French Antarctic and Austral Territories.

- a) authorising fishing within the 100-nautical mile inshore zone in Mayotte waters exclusively to this fleet (CFP Article 5 item 3 of the Regulation (EU) 1380/2013);
- b) since the fleet renewal is not encompassed by the CFP regulation, a public-private consultation should be launched for identifying possible actions and sources of funding for renewing the fleet. Possible actions to be undertaken are:
 - i. inventorying of fleets currently needing renewal, in order to 'quantify' the type of investment needed
 - ii. launch of consultations for exploring possible synergies for sustaining the renewal.

This is a short-term action, and local public authorities in association with fishermen representatives should play a key role in launching and managing public consultations. The involvement of the European Commission would support consultations.

Geographic scope of conclusion: Mayotte

Non-legislative conclusions

a) The coherence of public support within the sea basin should be better recognised and understood by stakeholders located in the ORs.

Local stakeholders (both local public and private stakeholders from different maritime sectors), in Réunion and Mayotte expressed their concern that public support from the EU and EU Member States to neighbouring countries might conflict with — or otherwise undermine — efforts to develop the ORs in the Indian Ocean.

Possible measures to define more coherent strategies in the fishery sector at the sea basin level could be:

- 1) regular round tables and information exchanges between EC services (for instance DG MARE and EuropeAid) and EU and EU MS developing agencies for project design and monitoring;
- 2) stakeholder consultations, including stakeholders in the ORs during the project cycle, especially during project design;
- 3) enhanced communications and exchange with stakeholders on the coherence of public support to neighbouring countries and to ORs.

A possible best practice to follow in this regard is the Consultations with Mayotte and Réunion stakeholders on sustainable fisheries partnership agreements (SFPA) between the EU and non-EU countries in the sea basin.

Geographic scope of conclusion: sea basin level

b) Monitoring fish stock status

Fish stock status is still unknown, and should continue to be monitored to support sustainable fishing, covering both tuna and non-tuna species (esp. straddling stocks). The measure should be activated by IOTC, for tuna species and by the SIOFA for non-tuna species. EU funds could support this action.

Geographic scope of conclusion: sea basin level

c) Development of marine aquaculture (red drum)

The sector is going through a difficult time in Mayotte, with its red drum hatchery going bankrupt. The local public authorities in association with local private actors are trying to re-launch the hatchery, hence the whole aquaculture sector, by recruiting a local hatchery manager (a local manager to run the hatchery in the absence of local hatchery technical skills). Re-launching production is expected by local stakeholders providing fish to the local market and to EU markets.

A feasibility and market study should be launched to assess the market and the financial medium to long term viability of the project (including health management

due to the insularity of the island). It is a short-term action, which should be initiated by local public authorities.

Geographic scope of conclusion: Mayotte

d) Monitoring of artisanal fishery activity

The artisanal fisheries sector needs to be monitored taking into account all active fishing boats, including those not complying with safety standards (unofficial fishing boats). Current data collection to monitor fishing activities in Mayotte does not include the monitoring of the unofficial fleet. The unofficial fleet has to meet legal standards, but its upgrade will not be achieved rapidly.

Activities on top of the current Fishery Information System should be envisaged, collecting data on unofficial fishing boat activities. Furthermore, a study should be launched to investigate the possibility of slightly increasing the capacity of the Direction de la Mer Sud Océan Indien (DMSOI) in Mayotte for the surveillance of small-scale fisheries in terms of human resources.

This is a short-action term (medium-term approach), and should be undertaken by local public authorities (Préfecture – DMSOI) in association with Parc Marin de Mayotte in charge of fisheries information in Mayotte.

Geographic scope of conclusion: Mayotte

e) Improvement of professional skills in the sector using structural funds

The fisheries and aquaculture sector lacks the professional skills to carry out day-to-day activities especially in terms of business management, but not only (see also safety standards). The professionalisation of small-scale fishermen should therefore be fostered, by providing training on business management and safety at sea.

This action could be carried out in the short term (medium-term approach) and could be supported by structural funds from a financial point of view. The action should be coordinated by local public authorities (Préfecture – DMSOI) in association with representatives from the sector.

Geographic scope of conclusion: Mayotte

f) Reducing the risk of the fishing fleet disappearing

The longline tuna fishing fleet in Réunion is ageing. The fleet needs to be renewed, to be able to safely reach fishing grounds in Réunion (otherwise there is a risk that the fleet will disappear in the medium term, replaced by vessels located in neighbouring countries such as Madagascar). However, this would require a considerable investment to ensure that a Réunion-based longline fleet remains economically viable in the region, and to prevent alternative investments in lower-cost locations such as Madagascar, with the loss of local jobs in Réunion. Workshops attended by local public and private stakeholders with representatives of the EU could be organised to investigate openly all additional public actions that can be triggered to support the fleet.

This action should be implemented by French public institutions in association with private stakeholders, and could be implemented in the short term.

Geographic scope of conclusion: Réunion

1.2.6.3 Coastal tourism

Legislative conclusions

a) Creation of a whale sanctuary

For two-thirds of observed whales in the sea basin, Réunion is a transit zone on their migratory routes, before breeding. For the other one-third, Réunion represents a

breeding and calving area, and is probably their natural migration destination. A whale sanctuary is to be set up as a protected area, rules are to be defined to regulate activities and enable activities such as whale watching.

The first step to be undertaken is the regulation of traffic with dedicated measures (maritime highways), to reduce the impact on whales of vessels transiting in the area. The second step would be to define rules to create and manage marine protected areas and maritime highways⁽⁹⁴⁾. Therefore, support for the classification of the site as a World Heritage site should be envisaged, to give international visibility to the zone.

This is a short-term action to be coordinated by Public authorities, and should involve private actors from the areas of Maritime transport, cruise tourism, and other actors involved in the supply chain.

Geographic scope of conclusion: Réunion

Non-legislative conclusions

a) Development of public-private dialogue and partnerships

The identity of coastal tourism in the area should be boosted through a series of possible actions to be coordinated by the Indian Ocean Commission and implemented by ministries in charge of tourism in the countries of this sea basin (acting closely with ministries responsible for the environment). First of all, exchange platforms or round tables should be set up, enabling private and public organisations — including those from other sectors where necessary — to meet at a regional (see section 0 too) and national level, identifying urgent and medium-term needs.

Geographic scope of conclusion: Sea basin level

b) Improving professional staff qualifications and creating liaisons between education and industry

One of the main needs of the area is to train personnel involved in the tourism sector of the sea basin. Courses for training these resources should be made available in the different territories of the sea basin. Language skills should be improved in the sector, targeting the languages most used by tourists (English, Chinese, Russian). Links between the educational and training systems and the industry should be created, in order to allow the supply of training to better meet professional demand. For instance, the development and implementation of exchange programmes between English and French speaking countries in the region could be undertaken, involving the industry when possible. The action could be implemented in the short to medium term, and could be supported by structural funding.

Geographic scope of conclusion: Sea basin level

c) Development of ecotourism

Tourism in Mayotte is based on and expected to be developed by ecotourism. To respond to demand, a 'supply' chain approach is required (from reaching and leaving Mayotte, to leisure activities and accommodation services), improving in particular accommodation quality and capacity.

This is a medium-term action, and should involve local public authorities, the Comité Départemental du Tourisme de Mayotte in association with private actors and investors. The following possible steps could be envisaged for implementing this action:

- 1) Diversification of accommodation quality, especially outside main towns by (i) analysing in detail needs, potential and interested investors and (ii) developing

⁽⁹⁴⁾ For further details see also IRD, 2015 analysing the socio-economic impact of whale watching in Réunion and Madagascar (reference in appendix 1 of the Annex 6 'Réunion').

- an action plan with actors in the sector. The diversification of leisure activities could include pesca-tourism (adding to income earned by fishermen).
- 2) Training to improve accommodation staff, in particular languages skills.
 - 3) Creation of a working group to implement recommendations made by experts from National Authorities on the attractiveness of marinas.

Geographic scope of conclusion: Mayotte

d) 'Supply chain' (integrated) approach to developing the tourism sector in Réunion

The sustainable development of tourism needs improvements along the entire 'supply' chain, from the port (cruise tourism), to airport logistics, the overall tourism offer in Réunion, skills of the local workforce, communication to attract tourists reluctant to visit Réunion following regular shark attacks over the past ten years.

In order to implement this conclusion, an action plan could be implemented defining measures as follows:

- 1) protecting two or three additional beaches and nautical activities against shark attacks (St Leu especially due to its international renown for surfing) – recommended as an urgent action;
- 2) workforce skills development including language skills (developing training programmes);
- 3) development of an integrated tourism offer in order to valorise natural assets;
- 4) leisure yachting development plan: set up a working group to implement recommendations made by experts from National Authorities on the attractiveness of marinas;
- 5) promotional campaigns to promote tourism in Réunion. Target: Europe (continuation of EU support) and Asia (emerging market).

This is a short-term objective, initiated by local public authorities and involving private actors of coastal and cruise tourism and stakeholders from the transport sector.

Geographic scope of conclusion: Réunion

1.2.6.4 Cruise tourism

Non-legislative conclusions

a) Adoption of an integrated approach for the development of cruise tourism

The development of cruise tourism in the sea basin requires an integrated and coherent approach, namely a regional strategy in terms of infrastructure, services and supply chain using the diversity of offer from different cruise destinations in the South West Indian Ocean. The EU should continue to co-fund platforms of information and views at the sea basin level through a) regional workshops and conferences; and b) indirect support to existing or newly created regional private associations to promote sustainable and safe tourism to participate to those workshops and conferences.

A specific regional strategy to develop cruise tourism at sea basin level should therefore be drafted (agreed between public and private stakeholders) in line with the regional blue economy strategy of the IOC ⁽⁹⁵⁾ too.

The measure, which can be launched in the short term, should be activated by the IOC, and supported by National tourism associations and port authorities through a regional organisation representing them (for instance through the Cruise Indian Ocean Association, CIOA).

Geographic scope of conclusion: Sea basin level

⁽⁹⁵⁾ See section 2.3.8 best practice 1.

b) Improvement of the cruise tourism supply chain

Cruise tourism is developing in the sea basin, with some stops in Mayotte and Réunion. To meet this demand, the supply chain is to be improved in all aspects, from offer on land to workforce skills. A preliminary analysis of needs, potential and interested investors should be carried out and, based on such findings, an action plan be developed with actors in the sector. The following measures should therefore be addressed:

- 1) workforce skills development, including language skills (developing training programmes);
- 2) minimising user conflict at ports, defining urgent needs to be met (quay space and related services) while enabling a sustainable increase in cruise tourism;
- 3) definition of an integrated approach at sea basin level within the supply chain;
- 4) working sessions, workshops and conferences to favour the networking of public and private stakeholders within the supply chain to exchange lessons learned and experiences and foster decision makers within the private and the public sector.

This is a short-term action, which should be activated by local public authorities in association with private actors and investors.

Geographic scope of conclusion: Mayotte and Réunion

1.2.6.5 Shipping

Legislative conclusions

a) New visas policy for trainers

Port staff are to be regularly trained. Specific trainers are recruited outside Mayotte, and as a consequence some of them are non-EU citizens. Delays in obtaining visas for Mayotte can be an issue when carrying out urgent training (a concern raised by MCG, the Longoni port management authority). A short study should be launched to assess legal ways to provide short-term access (visas) to Mayotte (not to all the EU) to trainers who are non-EU citizens. This is a short-term action which should be undertaken by local public authorities in association with the Mayotte Channel Gateway (MCG).

Geographic scope of conclusion: Mayotte

b) Application of a simplified or adapted legal framework for the development of infrastructure of general and public interest

Mayotte had to integrate EU legislation in its territorial development by becoming an EU OR recently. Local, national and EU regulations and related procedures can create an administrative burden for port development. For instance, the application of different environmental rules on natural risk management and marine submersion risk management during the port development process could generate overlapping and administrative burdens. Some local development plans can even become out-of-date before they come into force, such as the local urbanisation plan or the regional development scheme.

A study should be launched to investigate the possibility of applying 'Projet d'Intérêt Général (PIG)' (projects of general interest) procedures for the development of port infrastructures in Mayotte. These procedures enable a simplified or adapted legal framework for the development of infrastructures of general and public interest.

This is a short-term action to be activated by the MCG in collaboration with local public authorities.

Geographic scope of conclusion: Mayotte

c) Review of environmental rules for environmental impact assessment in ports

The local port management authorities in Réunion expressed their concern about the legal framework in terms of environmental impact assessment requirements. For instance, the maximum authorised level of nickel being too low in Réunion, the element being present naturally in the soil of Réunion, slowed down the port development.

A study should be launched to set derogations to the legal framework based on the latest information available. Furthermore, specific environmental expertise should be developed in Réunion to enable a thorough understanding of specificities of tropical ports. Attracting such expertise in Réunion or developing such remote expertise should be investigated too.

This is a short-term action which could be activated by GPMR (Le grand port maritime de La Réunion) in collaboration with local public authorities.

Geographic scope of conclusion: Réunion

Non-legislative conclusions

a) Development of short sea shipping in Mayotte

Short sea shipping around Mayotte main towns shows growth potential due to the geography of Mayotte (two islands already connected but requiring additional maritime roads among other main towns) and its congested road network.

A two-step action could be envisaged for developing short sea shipping in Mayotte:

- 1) Launch of a study to investigate the economic and financial feasibility of developing maritime roads within the Islands to transport goods, but also passengers, by consulting potential investors and local stakeholders active in the sector. Should a private development project be ready, investigate further its financial sustainability and potential public support.
- 2) Support to promote clean ship use with low carbon emissions in maritime transport, including short sea shipping activities, by co-funding research projects, commercial ships and promotional campaigns regarding the sector.

This is a medium to long term action, which should be developed by local public authorities (Conseil départemental and Préfecture).

Geographic scope of conclusion: Mayotte

b) Assessment of the possible role of Mayotte in oil extraction logistics and environmental impacts

Oil exploitation in the Mozambique Channel may be a reality in the near future, however these activities would be likely to require environmental impact minimisation. Mayotte could serve as a supply port for vessels involved in this new oil extraction sector. A study (or two separate studies) should be launched to evaluate the environmental impacts of this development and the potential and feasibility for Mayotte to become a supply port for oil exploitation in the Mozambique Channel. This is a short-term action to be activated by local public authorities.

Geographic scope of conclusion: Mayotte

c) Increase in port infrastructure for transshipments and imports of goods in Réunion

Following a population increase, the demand for goods will increase in Réunion, and consequently there will be an increase in the volume of maritime transport. Furthermore, port transshipments in Réunion are expected to continue increasing too. One maritime transport operator has located its sea basin facilities in Réunion.

Financial support is needed to develop port facilities in Réunion, for instance, by supporting new port sites, particularly the eco-port project 'Bois Rouge'.

Geographic scope of conclusion: Réunion

d) Development of free trade zones near port facilities

This action should be investigated to steer high value added imported products towards re-exports in the sea basin. Based on current projects (for instance the '40 hectares area'), it is necessary to investigate the feasibility and rationale (through a study) for supporting the creation of free trade zones near port sites in Réunion.

This is a short-term action, which should be launched by local public institutions and involve the GPMR in association with private stakeholders represented for instance by the Regional Agency for the development, investment and innovation (NEXA).

Geographic scope of conclusion: Réunion

1.2.6.6 Shipbuilding and ship repair

Non-legislative conclusions

a) Support for the development of shipyards

With the anticipated increase in sea vessel traffic and development of fisheries, maritime surveillance, maritime leisure and marine energy, there is a regional need for sustainable shipyards. In order to meet this need, regular networking of ports and shipyard owners at the sea basin level should be envisaged, by supporting the development of a platform of exchange and regional workshops between private and public stakeholders to identify and update needs and sources of funding for heavy investments (private and public). Furthermore, the development of new shipbuilding technologies (green technologies) should be supported by innovative co-funding projects.

This is a medium to long term action, which should be activated by the ports of the Indian Ocean in association with shipyard owners at the sea basin level. A potential coordination of actions could be entrusted to the Observatoires Villes Ports de l'Océan Indien (based in Réunion).

Geographic scope of conclusion: Sea basin level

b) Development of ship repair skills

Maritime sectors requiring ship repair services need the presence of skilled ship repair staff in several locations in the sea basin (for fishing vessels, maritime patrol boats and container ships). For instance, the Grand Port Maritime de la Réunion is planning to identify repair needs at the OR level as complementary services to repair services already in place in other neighbouring countries for a sustainable and competitive presence of these services. Possible measures to undertake actions could envisage the following:

- a) launch of a market study to evaluate competitiveness and requested skill levels within the sea basin (short-term measure);
- b) co-funding or funding of training programmes to train technicians or newcomers in the sector in different ports of the sea basin (medium-term measure);
- c) evaluation or re-evaluation of needs for specific workforce (and infrastructure) at the sea basin level on a regular basis to update the training programme and infrastructure requirements (long-term measure).

The potential coordination of such an action may be entrusted to the Observatoires Villes Ports de l'Océan Indien based in Réunion.

Geographic scope of conclusion: Sea basin level

c) Development of ship repair activities in Mayotte

Current ship repair services are i) either for public maritime transport or ii) available but working beyond their capacity. Light repairs are expected to be developed by the Longoni port. As a first step, a feasibility study for the development of ship repair activities should be launched. Secondly, potential private investors should be supported in applying for public funds for their development projects (including ship repairs for leisure boating).

Local public authorities should activate the action.

Geographic scope of conclusion: Mayotte

d) Exploring the potential development of the leisure boat building sector

Leisure boating is expected to grow in Réunion and in the sea basin. There is a potential for leisure boat building. For this reason, further analysis should be carried out to identify leisure boat building potential and companies based in the sea basin or beyond that could act as potential investors, and to highlight leisure port authorities and leisure port users in Réunion. The action should be activated by local public authorities in association with port authorities.

Geographic scope of conclusion: Réunion

e) Development of ship repair industry in Réunion

Ship repair activity is a key ancillary service to vessel-dependent maritime sectors (coastal tourism including leisure boating, cruise tourism, fisheries, maritime transport, etc.). Heavy ship repair is based in neighbouring countries; light ship repair services are however to be kept in ports in Réunion. A study is about to be launched by the Grand Port Maritime de la Réunion to identify needs for light ship repair services. Leisure boating may have the potential to develop in Réunion.

Further support is needed to develop the sector by ensuring adequate training for updating the skills of personnel involved in the sector, by organising sea basin workshops (to develop coherent ship repair services at the sea basin level) and by co-financing feasible projects from private investors or public management authorities for light ship repair services to meet demand from vessel-dependent maritime sectors (including repair services for leisure boating).

The action should be developed in the medium term, and be led by port authorities, in association with the actors of vessel-dependent maritime sectors.

Geographic scope of conclusion: Réunion

1.2.6.7 Blue biotechnology

Non-legislative conclusions

a) Capacity building in Indian Ocean and Réunion to launch research initiatives in Blue biotechnology

Blue biotechnology in the Indian Ocean has potential, by developing the already existing research and development structures in Réunion with a sea basin leadership. However, public support for blue biotechnology projects should be more diversified, by extending support beyond ERDF, enabling R&D with partners outside EU territories and adapting to R&D in tropical areas. Support for regional and international workshops among public and private stakeholders should be ensured to foster the co-funding of blue biotechnology projects at a sea basin level. The final aim is to develop local capacity to respond directly to EU calls for proposals on the funding of blue biotechnology projects in tropical environments.

This is a short to medium term action, to be activated by local public authorities in the different territories and by the Indian Ocean Commission, in association with other international cooperation agencies such as the World Bank.

Geographic scope of conclusion: Sea basin, with Réunion as leading actor

1.2.6.8 Marine renewable energies

Non-legislative conclusions

a) Structural development of marine renewable energies in the sea basin.

Marine renewable energies activity in the sea basin is at a research and development stage, and with few commercial applications in Seychelles and Réunion. The sea basin countries should be encouraged to participate in regional research and development projects for marine renewable energies commercial applications (with a medium-term strategy for Réunion to become a hub for research, development and innovation at the sea basin level and beyond). Considering the vital importance of energy supplies in the islands, the sector could represent a useful, alternative and clean source of energy. Possible actions to be undertaken for fostering research in Marine renewable energies are:

- 1) development of a regional exchange platform or round table putting together public and private stakeholders interested in developing this type of technology in the sea basin;
- 2) support with site identifications for pilot projects that the EU and EU investors could co-fund;
- 3) investigation of the potential and needs for creating a marine renewable energies cluster in the sea basin, which could coordinate efforts in the area for developing research in the sector and the possible commercial exploitation of production facilities.

This is a short-term action with a medium to long term approach; the Indian Ocean Commission has been identified as the leading actor, jointly with the Marine Renewable Energies cluster in Réunion Temergie.

Geographic scope of conclusion: Sea basin, with Réunion as leading actor

b) Development of adequate technologies for meeting local weather conditions

The sea basin faces extreme weather conditions. marine renewable energies technologies need to be adapted to these conditions for their commercial development on a medium to large scale. A first short-term action should be the collection of data on extreme weather conditions of cyclones (current and wave data), using research buoys. Adapted technologies should therefore be developed (long-term action) at suitable costs compared to other energy sources.

The action could be activated by the Indian Ocean Commission jointly with the MRE cluster Temergie and the research institute Lacy, based in Réunion.

Geographic scope of conclusion: Sea basin, with Réunion as leading actor

c) Research to develop sea water air conditioning (SWAC) and ocean thermal energy conversion (OTEC) in Mayotte

Mayotte is increasing its use of renewable energies by producing solar energy, and the development of marine renewable energies is also being investigated, more specifically SWAC and OTEC. While OTEC costs are considered as being too high for being viable, in the short to medium term, these costs may become more accessible. Two steps are envisaged to explore the potential of these energies in Mayotte:

- 1) Feasibility study or pilot projects to deepen knowledge of the feasibility of SWAC — and to some extent OTEC technologies — and their practical implementation (short-term action);

- 2) Networking to investigate the possibility of using other marine renewable energies technologies through regular exchanges with public and private stakeholders at national, sea basin and international level.

Local public authorities should activate the conclusions, especially measure 1), while measure 2) should be activated at a broader level, involving also the IOC, with the proactive participation of Mayotte.

Geographic scope of conclusion: Mayotte

d) Support for training workforce in Réunion

Marine renewable energy (MRE) development in Réunion would require R&D projects, even if several pilot MRE projects failed. Pilot commercial applications of seawater air conditioning technologies are being implemented. The conditions in Réunion are suitable for international R&D and for seawater air conditioning development for commercial applications in the EU OR. The EU should continue to support MRE projects and R&D in Réunion by co-funding multi-annual programmes, preferably including workforce training (engineers, oceanographers, boilermakers and welders) and enhancing links between researches and industry.

Geographic scope of conclusion: Réunion

1.3 Macaronesia

The sea basin is of strategic interest due to its political, geographical and cultural links to the EU, Africa and South America and it is particularly relevant for maritime transport, ports services, coastal and maritime tourism. It provides natural advantages for aquaculture, blue biotechnology and blue renewable energies. Advanced R&D in the ORs is an asset for the development of the diverse sectors.

Under an environmental point of view, the Macaronesia sea basin is facing an increase in temperature, a rise in sea level and reduction of the average annual rainfall. Concentration of rainfalls in certain periods might cause landslides. Strong sea storms, in combination with the sea level rise, might cause floods of potential damage for coastal areas and tourists and maritime infrastructures. Ports and maritime transport might be particularly affected, posing a threat to blue growth in the area. Marine biodiversity might also be affected by temperature and sea level rise ⁽⁹⁶⁾.

The fishing activity might face changes in fishing patters due to the disappearance of traditional target species and arrival of tropical species. The fishing industry in Cape Verde might suffer more from climate change. Adaptive actions are being considered and priorities should be established for coastal protection, water, energy, amongst others. Cooperation with Cape Verde is also being formalised ⁽⁹⁷⁾.

1.3.1 Mapping of the state of art of maritime activities

In the paragraphs below the main findings are given for each identified maritime activity (from more traditional to more innovative activities) at sea basin level and in each OR. Furthermore, the main organisations and actors operating in the maritime sector are also given. Detailed findings of the mapped maritime activities, main strategies and stakeholders for the Macaronesia sea basin, related ORs and the republic of Cape Verde are reported in Annexes 7, 8, 9 and 12 in the following chapters:

- chapter 1: mapping of all maritime activities;
- chapter 5: list of public authorities;
- chapter 6: list of maritime strategies;
- chapter 7: list of stakeholders.

The inclusion of Cape Verde in this section aims to provide a more comprehensive view of the sea basin and the opportunities for growth and cooperation in the archipelagos.

1.3.1.1 Fisheries and aquaculture

Marine commercial fishing has a long tradition in the **Macaronesia** sea basin. Activity is characterised by the predominance of small-scale activities, with vessels smaller than 12 m in length. Fishing activity has shown declining trends in terms of the number of vessels and fishermen, due to the reduction of OR fleets, fleet capacities and fishing opportunities. Fishing activity in the republic of Cape Verde is an important branch of the economy, and is one of the leading sectors in terms of exports. Activity is mostly based on fish and shellfish of high commercial value, exported fresh, frozen and canned. In 2008, the sector employed 10 500 people.

As regards aquaculture, the waters of the archipelagos enjoy good conditions for the development of aquaculture, with the right minimum and maximum temperatures throughout the year. This allows fish to reach commercial size earlier than in other regions. The Canary Islands is the leader in the region. Activities have the problem of insularity, substantially increasing transport costs. EU compensation for transporting these goods plays a key role in reducing transport costs.

⁽⁹⁶⁾ http://ec.europa.eu/regional_policy/fr/information/publications/studies/2014/the-economic-impact-of-climate-change-and-adaptation-in-the-outermost-regions.

⁽⁹⁷⁾ <http://www.lavanguardia.com/local/canarias/20161121/412041021748/lanzarote-y-cabo-verde-aliados-cambio-climatico-y-sostenimiento-medioambiente.html>.

With regard to processing, the Azores has an important tuna canning activity. In the past, an important canning industry existed in the Canary Islands, but activity ended in the early 2000s. Madeira's canning industry also disappeared in the early 2000s. There are processing activities in Cape Verde, owned by foreign companies established in the archipelago. They produce frozen and canned fish and shellfish. In relative terms, the Cape Verdean processing industry is the most important in Macaronesia. This constitutes one of the most important sectors of the Cape Verdean economy.

In the **Azores**, the only fleet segment dedicated to a specific species is the tuna fleet that operates during part of the year, taking advantage of the migration of tuna in the Atlantic. Fishing of deep-water species is multi-specific, i.e. vessels are not specialised for the use of a single type of gear, and the fleet is composed mainly of vessels less than 9m long, making up 65 % of the total fleet (in number). Currently there is no marine aquaculture in the Azores, mainly because natural and weather conditions are not favourable. The processing of fish products is concentrated in units producing preserved tuna, for exports only. Considering limited consumer demand for fresh fish, this industry is the main purchaser of production of the regional tuna fleet.

The archipelago of **Madeira** is conditioned by natural characteristics, in particular the narrow continental shelf, which limits available habitats for coastal and demersal species and fishing methods. Furthermore, the waters around the Archipelago are extremely deep and have very low productivity. The main exploited species consist of deep-water fish and migratory pelagic fish: black scabbard fish makes up almost 46 % of Madeiran landings in value terms, and tuna and tuna-like species around 42 % of the total value of landings. The fishery sector is predominantly artisanal. As regards aquaculture, it is an activity with a slight economic weight but with a high potential, due to favourable climatic and environmental conditions. In order to meet the need of creating a technical infrastructure for the development of aquaculture, the Regional Government of Madeira created in 2000 the 'Centro de Maricultura' in Calheta. Today, the Centre produces juveniles for active companies, and has a nursery where native species cultivation techniques are being developed.

Marine fishing is an economic activity with a long tradition in the **Canary Islands**. The most important resources harvested in the archipelago waters are small pelagic species such as Atlantic chub mackerel (21 % of landings), sardinellas (18 %), skipjack tuna (16 %), parrotfish (5 %), yellowfin tuna (4 %). Around 87 % of the fleet is dedicated to artisanal activities with diverse fishing gears, while the remaining boats are trawlers, longlines and purse seiners. As regards aquaculture, in 2015 aquaculture production totalled 7 648 tonnes, with a value at first sale prices of EUR 34 million. The activity is almost entirely based on the culture of sea bass and sea bream reared in sea cages. In 2011, the sector started to produce microalgae, Senegalese sole and shrimps. Processing activity consists mainly of processing fresh and frozen fish for distribution, freezing and production of cured and smoked fish. During the 1980s and 1990s, the Canary Islands possessed a large canning industry, which processed fish and shellfish captured by the Canarian fleet in the Canarian-Saharan fishing ground. In the year 2000, Morocco imposed strong access restrictions on the fishing ground, and this led to the closure of the canning industry and a substantial reduction of the fishing fleet. The processing activity has almost disappeared in the archipelago.

1.3.1.2 Coastal tourism

Tourism is a well-established activity in the Canary Islands and Madeira, where this activity — which goes beyond coastal tourism as it includes many non-maritime activities — accounts for a high share of GVA and employment. For Madeira, it accounts to almost 21 % of GVA and 20 % of employment ⁽⁹⁸⁾, while for the Canary

⁽⁹⁸⁾ Our elaboration of data from the Instituto Nacional de Estatística, Sistema de contas integradas das empresas.

Islands tourism makes up 31.4 % ⁽⁹⁹⁾ of total GVA and 34.5 % of total employment ⁽¹⁰⁰⁾. By contrast, tourism activity is quite recent in the Azores and Cape Verde. In Cape Verde tourism, and especially coastal tourism, is gaining in importance, and accounts for 50 % ⁽¹⁰¹⁾ of the services sector, which in turn makes up 60 % of the economy of this archipelago ⁽¹⁰²⁾. This means that the Cape Verdean tourism sector should account to 30 % of the national GVA (data for 2013). A recent publication ⁽¹⁰³⁾ providing data on travel and tourism together considers that this share in the national economy might be even higher (around 44 %), including direct and indirect effects. This proves the increasing importance of tourism in Cape Verde that can be, together with Canary Islands tourism, the most representative in the region in terms of socio-economic importance.

Coastal tourism shows great potential all around the Macaronesia sea basin. The old tourism model of sun and beach is gradually giving way to a new model of tourism that takes advantage of the marine environment and its resources and the coastal culture. New tourism modes include nautical activities, whale and bird watching, pesca-tourism and marine gastronomy, among others.

In the **Azores** tourism offer is more nature-oriented, and has been increasingly identified as a recommended destination in international tourism circles. Accommodation is dominated by traditional hotels. In general, the number of hotels has been growing in recent years. This growth has been accompanied by an increase in the number of tourists. The development approach adopted by Regional Authorities in recent years, focused on market diversification, mitigation of seasonality and the development of services, such as congress areas, golf and nautical tourism, investments in four and five-star resorts and rural tourism. Taking advantage of the unique characteristics of the region should be a pillar of development in the Azores, including nature tourism, rural tourism, nautical tourism and cruise tourism.

For **Madeira**, tourism is the most important sector of the regional economy. The environment and landscape, as well as the distinctive nature of the region, are crucial for tourism. Tourism demand has changed in recent years. The traditional tourist visiting Madeira usually comes from Northern Europe (UK and Germany), has an advanced age and large purchasing power, and looks for rest in hotels. Nonetheless, in the last 10 years there has been a gradual reduction in the average age of tourists visiting Madeira, and therefore a change in requested tourism activities. Nowadays, the connection between nautical sports and recreational maritime activities and tourism is strong in Madeira, and activities such as whale watching, scuba-diving, surfing, body boarding, windsurfing, stand up paddling, recreational fishing,

⁽⁹⁹⁾ Source for total GVA of Canarias:

<http://www.datosdelanzarote.com/itemDetalles.asp?idFamilia=10&idItem=4250>, GVA for tourism: IMPACTUR (2014). Estudio Impacto Económico del Turismo en Canarias. Exceltur. Gobierno de Canarias. <http://www.exceltur.org/wp-content/uploads/2015/06/IMPACTUR-Canarias-2014.pdf>. It should be noted that the figures provided in the IMPACTUR report include also estimate of non-maritime activities directly linked to coastal tourism such as travel agencies, souvenir stores, car rentals; and others indirectly linked to the tourism sector e.g. energy, water, consultancy services, etc. The inclusion of these data in the IMPACTUR report explains the different share of the tourism sector in the overall regional economy.

⁽¹⁰⁰⁾ IMPACTUR (2014). Estudio Impacto Económico del Turismo en Canarias. Exceltur. Gobierno de Canarias. <http://www.exceltur.org/wp-content/uploads/2015/06/IMPACTUR-Canarias-2014.pdf>.

⁽¹⁰¹⁾ Source of the tourism share in the Cape Verdean economy:

<http://www.proexca.es/Portals/0/Documents/EstudiosMercado/Africa/EI%20Sector%20Turismo%20en%20Cabo%20Verde%202015.pdf>. Notice that the source indicates that this share should be around 60%. Considering that the boundaries of the tourism activities are unclear especially regarding the lack of updated data on the country's economy a 'conservative' estimation is considered (50 %).

⁽¹⁰²⁾ Banco de Cabo Verde. Boletim de Estatísticas, July 2016.

⁽¹⁰³⁾ Travel & Tourism Economic Impact 2017 Cape Verde. <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2017/capeverde2017.pdf>.

underwater archaeology, sailing, visits to Desertas Islands, etc. have experienced a steady increase.

As confirmation of the island's potential and promotional efforts in recent years, Madeira was chosen to host the sixth round of the Extreme Sailing Series Ocean Race, which for safety reasons was moved from Turkey to the Atlantic Ocean. This event represents an excellent opportunity to promote Madeira as a destination for nautical tourism, and strengthens the international reputation of the region.

Tourism is also the main economic activity in the **Canary Islands**. In terms of employment, tourism accounted for 34.5 % of total employment. In all islands of the archipelago, tourism is an important economic activity, but the kind of tourism differs from island to island (beach in Gran Canaria and Fuerteventura, landscape in Lanzarote and Tenerife).

Nautical tourism is another important branch of coastal tourism. Infrastructures have been developed, offering a total of 7 226 berths, distributed in 32 sport harbours. The archipelago is becoming an international centre of nautical tourism.

1.3.1.3 Cruise tourism

Cruise tourism is one of the most important maritime activities in Macaronesia. In **Madeira**, cruise tourism is able to offset traditional tourism seasonal cycles. Indeed, the cruise passenger season is mainly in the period between October and April (85 %). Peak demand occurs in December, as a result of strong demand driven by tour packages offered for the New Year holidays. In terms of reception conditions, the tourist Port of Funchal has recently been reorganised for cruise passenger traffic. In 2010 the New Maritime Terminal was opened. The Terminal is able to receive up to three cruise ships.

Cruise tourism in the **Canary Islands** is also highly relevant. In 2015, the number of cruise passengers was 2.19 million (16.4 % of all tourists). Tenerife and Gran Canaria have the largest share of cruise tourists (79 %). Las Palmas is the port base for most of the movements of cruisers in the Canarian archipelago. The sector was resilient during the worst years of the crisis, and its growth has been steady (¹⁰⁴).

The **Azores** position in the cruise sector relates mainly to the annual repositioning of cruise ships between North America and Europe. Every year in the autumn, indeed, many important cruise ships are 're-located' from the Mediterranean (in which the cruise season is mainly concentrated in Spring-Summer) to the Caribbean Sea (in which the cruise season is mainly in Autumn-Winter). During the cross-Atlantic trip, cruise ships stop off in the Azores. These stopovers are mainly concentrated in October and November. In 2015 the ports of the Azores recorded 138 cruise ship stop-offs, and 117 784 passengers, around 40 % more than in 2014. Despite this promising increase, passenger flows are largely from neighbouring territories (Canary Islands and Madeira).

1.3.1.4 Shipping

Looking at activity at **sea basin level**, the strategic position of the four archipelagos in the Atlantic Ocean offers advantages for the development of freight maritime transport. The fragmentation of the territory makes ferries the most important means of passenger transport in terms of the number of passengers. The largest and best equipped ports are located in Azores, Madeira and Canary Islands. Large investments have been made to turn these ports into competitive infrastructures able to take advantage of the strategic location of the archipelagos.

With regard to **Azores** in particular, inter-island passenger transport is provided by two companies, and is conditioned by seasonality and weather conditions. The number

(¹⁰⁴) As reported in the study on cruise market in the Canary Islands prepared by private consultants: Estudio del mercado del turismo de cruceros en Canarias. Temporada 2014-2015. EDEI Consultores S.A. 2013.

of ferry passengers has gradually been increasing, with a positive impact on economic indicators for this activity. As regards freight maritime transport, the archipelago is linked to the Portuguese mainland through three freight companies transporting containers. The remaining freight traffic concerns the transportation of liquid and solid bulk. In recent years the activity has declined in terms of goods loaded and unloaded, although there was a partial recovery in 2015 ⁽¹⁰⁵⁾. The region has invested in the last decade in port infrastructures and facilities, with the aim of stimulating economic activities that depend on maritime traffic. Port potential is also linked to sailing and yachting activities. At present, there are a number of marinas that can support flows, but continuous modernisation and reception facilities (with higher number of berths) should be planned.

One ferry operator is active in **Madeira**, connecting Madeira Island and Porto Santo Island. At present, there is no passenger maritime connection with the mainland, so the region depends entirely on air transport. Despite its social relevance and needs, ferry passenger transport is characterised by the high seasonality of tourism in Porto Santo, and its growth potential proved to be limited. There are currently five companies dealing with freight transport between the mainland and Madeira. Movements of freight in Madeira ports have decreased by around 34 % in the last five years ⁽¹⁰⁶⁾. Activity supports the free trade zone in Caniçal, and overall supplies of the Madeira archipelago have lost their support and service status in the Atlantic.

In the last decade port infrastructures have been the subject of an important investment modernisation programme. This investment programme reorganised all harbour infrastructures, leading to a specialisation of the most important ports. Several marinas are available in Madeira, but Funchal is the most important. It is permanently overloaded, and there is a long waiting list for renting berths. Considering that Madeira has a strategic position in the Atlantic area, being a crossroads of Atlantic Ocean routes, this lack of mooring places is negative for the development of the sector on the Island.

In the **Canary Islands**, the maritime transport sector comprises two subsectors, passenger transport using ferries, and coastal freight water transport. In 2015, Canarian ports moved nearly 8 million passengers in the ports of Santa Cruz de Tenerife and Las Palmas, which represents an all-time high. With regard to freight, Canarian ports moved 36 million tonnes, 31 % less than in 2007. Moreover, there are over 75 monthly shipping services connecting the Canary Islands with the countries of West and North Africa. Investments are being made in the ports such as the construction of a new dock and storage facilities for grain and other food products in Las Palmas port. These investments will provide services to South American exporters. Investments are also made for the cruise activity quay e.g. enlargement of Puerto del Rosario.

Canarian ports include spacious and modern basins, with large storage and operation capacities, multiple container and rolling traffic terminals, a large refrigerator storage capacity and excellent facilities for passenger traffic and cruise ships. The port infrastructure is completed by a wide variety of repair companies covering both technical and safety demand from international companies.

1.3.1.5 Blue biotechnologies

In **Madeira** one micro company is investing in the blue biotechnology market, dedicating itself to the production of natural extracts obtained from marine macroalgae. The company promoted, in conjunction with the University of Madeira, the project 'Bioprospeção de Macroalgas Marinhas para Cultivo e uso da Matéria-

⁽¹⁰⁵⁾ See Annex 7, § 1.3.3.

⁽¹⁰⁶⁾ APRAM, Administração dos Portos da Região Autónoma da Madeira, SA. See also Annex 8, § 1.4.3.

Prima na Produção de Extractos' (BPMA) funded by the programme INTERVIR⁽¹⁰⁷⁾, aimed at bioprospecting and producing seaweeds for obtaining natural extracts.

In 2006, a pilot project was launched, consisting of a biofuel production plant using microalgae in Porto Santo Island. It was a pioneering project aimed at replacing fuel used in the production of electricity on the island with biofuel of marine origin with the intent of making Porto Santo a green island. According to interviewees, the project did not work as envisaged. Indeed, there were problems using this technology at industrial levels. The plant still exists, but it works at a micro level.

In other ORs, the activity is still at a pre-development stage. No information has been surveyed. It is worth noting that production of microalgae is taking place in Canary Islands. This activity, a branch of the aquaculture sector, is regarded as the basis for future blue biotechnological activity.

1.3.1.6 Marine renewable energies

In **Azores**, in Pico Island, there is one of the first wave energy plants in the world, OWC type (oscillating water column connected with a Wells turbine). The plant is a pilot project and has been designed by the Instituto Superior Técnico in collaboration with the Queen's University of Belfast and the University College Cork. Technical problems cropping up so far and the marginal volumes of energy produced do not allow wave energy to be considered as a promising activity for the short to medium term.

In the **Canary Islands**, the regional government is requesting from Spain the recognition of competences in relation to marine renewable energies. The regional government is devoting funds to the Plataforma Oceanográfica de Canarias (PLOCAN), which has great potential to become a world reference as a platform for the development and testing of marine technologies. The natural oceanographic conditions of the archipelago provide the opportunity for transforming the Canary Islands into an international laboratory for the testing of new blue energy developments. Interviewees, however, consider that there is still a long way to go to turn blue energy into a commercial sector in the archipelago.

1.3.1.7 Other maritime activities

The table below gives all other maritime activities identified in the sea basin, describing them for each OR (or at sea basin level). Detailed analyses carried out on these activities are given in Annexes 7, 8 and 9 for ORs and Annex 12 for Macaronesia as a whole.

Extraction of aggregates: operation of gravel and sand pits
Extraction of aggregates has direct impacts on the environment and on the bio-resources. The development of such activities is not in line with sustainable blue growth. The following paragraph provides an overview of the activity in the sea basin. This activity is conducted only in the Portuguese archipelagos of Azores and Madeira . In Azores the activity consists of sand extraction, while in Madeira the activity comprises gravel and sand extraction. In both cases activity has limited economic weight, and employs few people. This activity does not offer good prospects due to the decline of demand and high investments required to carry out the activity (see Portuguese OR reports).
Desalination
This activity is carried out almost entirely in the Canary Islands. There is one plant in Madeira , which seems sufficient to satisfy local demand. The activity is being developed in Cape Verde . No official data are available on the number of plants currently operated in the Cape Verdean archipelago. Development of the activity is receiving international support. In turn, the Canary Islands are among the world leaders in the desalination of seawater. The large sector comprises 320 plants. This activity has been one of the factors allowing tourism development in the Spanish archipelago. This activity consumes large amounts of electricity produced from fossil fuels. This

⁽¹⁰⁷⁾ Programa Operacional de Valorização do Potencial Económico e Coesão Territorial da Madeira (Operational programme for the promotion of the economic potential and for the territorial cohesion of Madeira) created within the European Regional Development Fund.

condition substantially increases costs, producing an environmental impact. Experiences are ongoing in the Canarian archipelago to use on-land wind energy in desalination plants.

Shipbuilding and repair

Shipbuilding is a marginal activity in the **Macaronesia** sea basin. In the **Azores**, the activity consists of the construction of fishing vessels. In the **Canary Islands** there is no steel vessel building activity. Wooden vessels are still constructed, but the activity is in decline. Ship repair activity is also in decline in **Azores**, and consists of the repair of fishing vessels and recreational boats. The activity, especially ship repairs, could represent an important development possibility, considering the potential increase of yachting and sailing boats calling for services in Azores. Ship repair activity in **Madeira** is concentrated in Funchal, with a number of companies involved in the repair of engines, electric and electronic parts and mechanical repairs. Its development is linked to the increase in yachts and sailing boats calling in at the islands and to the management of spaces in port areas. Ship repairs in the **Canary Islands** have declined, with the problem of access to third-country fishing grounds. Revision, repair and maintenance of oil platforms of the Gulf of Guinea carried out by shipyards in the Canary Islands have contributed to the reactivation of shipyard activity during the last five years, although the drop in oil barrel prices has slowed down the growth of the sector. In turn, the growth of nautical activities offers opportunities for the reactivation of the sector, e.g. fitting out & repair of nautical craft.

1.3.1.8 Main organisations and actors operating in the maritime sector

In this paragraph, the main public and private stakeholders operating in the sea basin and in each OR are reported, highlighting for each of them their role in the relevant policies and maritime activities.

Table 8 – List of main organisations and actors operating in the Macaronesia sea basin

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
Sea basin	Maritime Cluster of Macaronesia	Cluster representing all maritime sectors.	All maritime sectors	To promote growth and sustainable employment, according to the maritime strategy for the Atlantic.
Sea basin	International Commission for the Conservation of Atlantic Tunas (ICCAT)	Regional Fisheries Management Organisation (RFMO)	Fisheries	ICCAT is an inter-governmental fishery organisation responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas.
Azores	Direção Regional dos Assuntos do Mar	Public actor	All maritime sectors	It helps to define regional policy in the maritime sector of the Azores, the sustainable management of maritime space, ocean exploration, licensing of sea and water uses, protection of coastal borders, as well as guiding, coordinating and controlling their execution.
Azores	Direção Regional das Pescas	Public actor	Fisheries and aquaculture	It helps to define regional policy in the areas of fisheries and aquaculture, including industry and related activities, as well as guiding, coordinating and monitoring their implementation.
Azores	Direção Regional do Turismo	Public actor	Tourism	To ensure implementation of the policy defined by the Regional Government for the tourism sector.
Azores	Direção Regional dos Transportes	Public actor	Maritime Transport	It help to define and implement regional policies in the areas of air, sea and land transport.
Azores	Serviço Regional de Estatística dos Açores	Public actor	All maritime sectors	Regional statistics.
Azores	Portos dos Açores, SA	Public actor	Ports	Management of ports.
Azores	Observatorio	Private	Tourism	To promote the analysis, dissemination and

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
	Turismo Açores	actor		monitoring of tourism trends.
Azores	LOTAÇOR	Private actor	Fishery	Management of auctions.
Azores	IMAR — Universidade dos Açores	Private actor	Marine research	Transversal Research on maritime activities.
Azores	Centro do Clima, Meteorologia e Mudanças globais, Universidades dos Açores	Private actor	Marine research	Research in the fields of insular climatology and meteorology, maritime climate and meteo-oceanography, physical and chemical properties of the atmosphere, hydro-climatology, agro-climatology and Bioclimatology.
Canary Islands	Agencia Canarias de Innovación y Sociedad de la Información (ACIISI)	Public actor	R&D, innovation, capacity building for all productive sectors, including the marine and maritime sectors	The ACIISI is responsible for implementing public policies and programmes in research, technological development, business innovation and the information society. This agency oversees the implementation of the RIS3 strategies in the Canary Islands, where the Blue Growth strategy is framed. The fields of competence of ACIISI are: Research; Innovation; Information Society; Development of human capabilities and innovative research; scientific and technological infrastructures; Support of the Coordination Commission of Science, Technology and Innovation.
Canary Islands	Consejería de Turismo, Cultura y Deportes	Public actor	Tourism	This Consejería (ministry) oversees the planning and promotion of tourism in the Canary Islands.
Canary Islands	Consejería de Agricultura, ganadería, pesca y aguas	Public actor	Fisheries and aquaculture	The Consejería (ministry) of Agriculture, Livestock, Fisheries and Water prepares and implements government policy for agriculture, fisheries, food, and land surface and underground waters. It is responsible for implementing the CAP and CFP in the Canary Islands.
Canary Islands	Port Authority of Las Palmas	Public actor	Port	Public institution that manages five ports: La Luz, Salinetas, Arinaga, Marbles and Puerto del Rosario; in 3 different islands: Gran Canaria, Lanzarote and Fuerteventura.
Canary Islands	Port Authority of Santa Cruz de Tenerife	Public actor	Port	Public institution that currently manages the ports of Santa Cruz de Tenerife, Santa Cruz de La Palma, Los Cristianos, San Sebastian de La Gomera and La Estaca.
Canary Islands	Canary ports	Public actor	Port	Planning, operation and management of the port system owned by the Canary Island Government.
Canary Islands	PROEXCA	Public actor. Promotion of exports	All maritime sectors	To improve the competitiveness of Canarian enterprises through support for their internationalisation and to attract investments to the archipelago.
Canary Islands	Instituto Tecnológico de Canarias (ITC)	Public actor. R&D.	R&D (renewable energies, desalination, biotechnology)	The ITC conducts Research, Development and Innovation at a regional level. ITC supports the Island's integral development through the implementation of practices and deployment of R&D projects in renewable energies, desalination of seawater, biotechnology, among others.
Canary	Maritime	Cluster	Maritime	The cluster aims to promote the

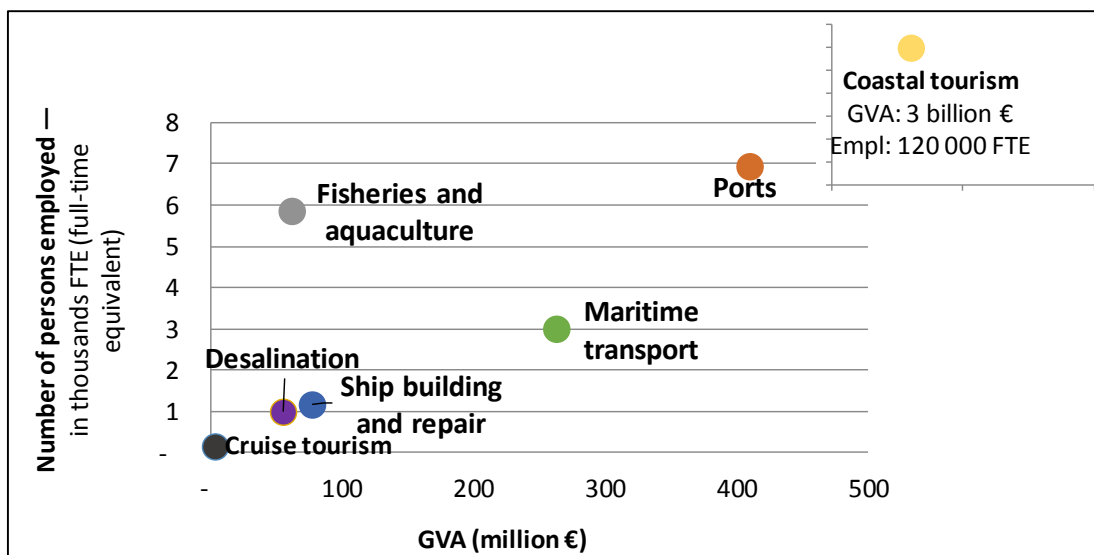
OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
Islands	Cluster	representing the maritime sectors of Canary Islands.	sectors : ship repair, aquaculture, fishing, nautical sports, recreation, tourism	development and international competitiveness of the Canarian maritime sector. The sectors include ship repair, infrastructures and maritime transport, aquaculture, marine biotechnology, fishing, nautical sports and recreation, R&D in renewable offshore energies, and auxiliary maritime services.
Canary Islands	PLOCAN (Plataforma Oceanográfica de Canarias)	Public actor. R&D	R&D (renewable energies, oceanography, aquaculture)	Its mission is to develop cost-effective combinations of services such as observatories, test beds, underwater vehicles support, information technology, and training and innovation hub. Its activity is focused on renewable energies, underwater robotics, safety and security, ocean observation, environmental impact and pollution control or technologies associated with harnessing marine resources.
Canary Islands	Universidad de las Palmas de Gran Canaria (ULPGC)	Public actor. Education, R&D.	R&D (aquaculture, biotechnology, marine sciences)	The ULPGC's research fields include marine science, computer, telecommunications and electronic technology, economics, development cooperation, renewable energies, environmental conservation and tourism, among others.
Cape Verde	Ministry of Agriculture and Environment	Public actor	Fisheries and aquaculture	This ministry is responsible for the development and regulation of the environment and primary industries in Cape Verde.
Cape Verde	Ministry of Economics and Employment	Public actor	All maritime sectors	The ministry is responsible for the development and regulation of economy and employment in Cape Verde.
Cape Verde	SIA (Environmental Information System)	Private sector	All maritime sectors	The task is to plan and manage the development and seek the optimal and integrated use of natural resources and national environmental policy, coordinating cross-sectoral systems having an impact on ecological sustainability and protecting natural biodiversity, environmental education, participation and information to the public, non-governmental organisations and companies.
Cape Verde	Maritime Cluster of Cabo Verde	Private sector	All maritime sectors	The country has set a Strategic Agenda for the Maritime Cluster, with a small and dedicated organisation (the Cluster) set up to promote the maritime sector in the broadest sense.
Cape Verde	University of Cape Verde	Public actor. Education, R&D.	Education, all maritime sectors	The University of Cape Verde is a public institution of higher education located in Praia, Cape Verde.
Madeira	Direção Regional da Economia e Transportes	Public actor	Ports, cruising, ferry transport, Nautical sports, air transport	To ensure the implementation of policies defined by the Regional Government for the sectors of Commerce, Industry, Energy, Quality, Transport and Mobility.
Madeira	Direção Regional de Pescas	Public actor	Fisheries and aquaculture	To ensure implementation of the policies defined by the Regional Government for the fisheries and aquaculture sectors.
Madeira	Direção Regional do	Public actor	Tourism	To ensure implementation of the policies defined by the Regional Government for the

OR/sea basin	Name of the authority	Type of actor	Maritime sector(s)	Main roles and responsibilities
	Turismo			tourism sector.
Madeira	Direção Regional do Ordenamento do Território e Ambiente	Public actor	Sea policy: safety, tourism, sport, education, R&D, protection of environment , sustainable exploitation of resources	To ensure implementation of the policies defined by the Regional Government for Sea policies.
Madeira	Direção Regional de Estatística	Public actor	All	Regional Statistics.
Madeira	Centro maricultura da Calheta	Public actor	Aquaculture	To assist with the development of a marine aquaculture industry in the Autonomous Region of Madeira.
Madeira	Observatório Oceânico da Madeira	Private actor	R&D	Research and monitoring of the ocean.
Madeira	Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação de Madeira	Private actor	R&D	Private non-profit association that aims to strengthen collaboration and links between its members in the scientific and business communities and to promote and support research and development.
Madeira	Universidade da Madeira Centro de estudos da Macaronésia	Private actor	Marine research	Research into biotechnology and biological resources.
Madeira	Administração dos Portos da Região Autónoma da Madeira, SA	Private actor	Ports	To manage port infrastructures in order to ensure access and the movement of persons and goods.
Madeira	Sociedade de desenvolvimento da Madeira, s.a.	Private actor	Shipping and investment promotion	Responsible, on behalf of the Regional Government of Madeira, for the management, administration and promotion of the International Business Centre of Madeira (IBC).

1.3.2 Identification of the most important maritime activities

Maritime-based economic activities contribute significantly to the overall economy of the Macaronesia sea basin. Of these, **coastal tourism, cruise tourism, shipping** (maritime transport and ports) and **fishing and aquaculture** play a major role in the overall Macaronesia economy, given that (i) all these activities have been identified in all countries and ORs and (ii) they present the highest level of development in almost all territories. Regarding cruise tourism, indicators underestimate the real weight of the activity, since the indirect effects on local economies cannot be appropriately estimated.

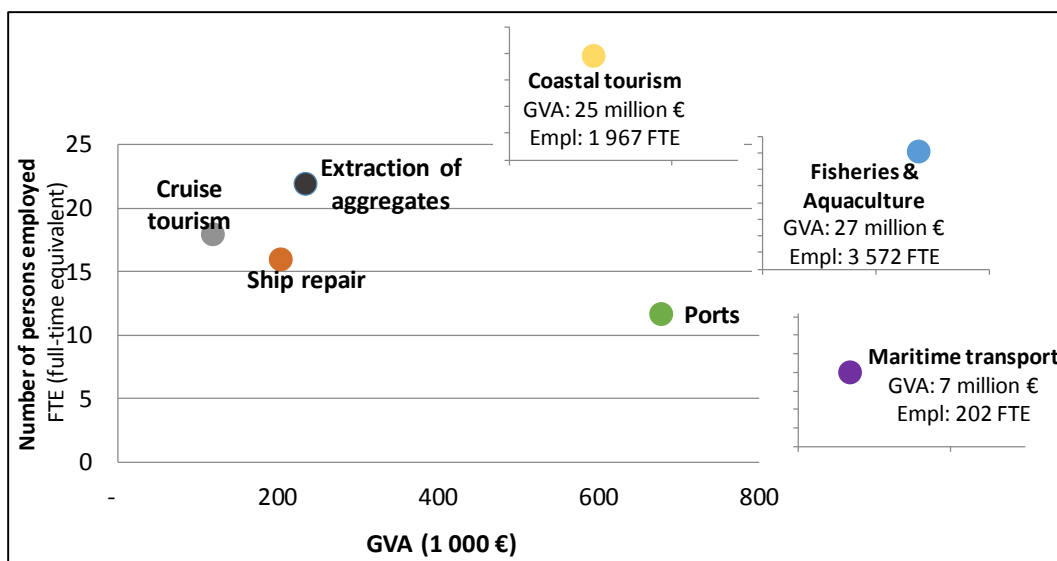
Figure 8 – Map of maritime activities identified in the Macaronesia sea basin



Source: see chapter 1 of Annex 12. 2014 data. For Shipbuilding and repair data refer to 2013.

Looking at the blue economy of each OR, these four activities have the highest socio-economic impact on local economies, as the charts below show (except for cruise tourism).

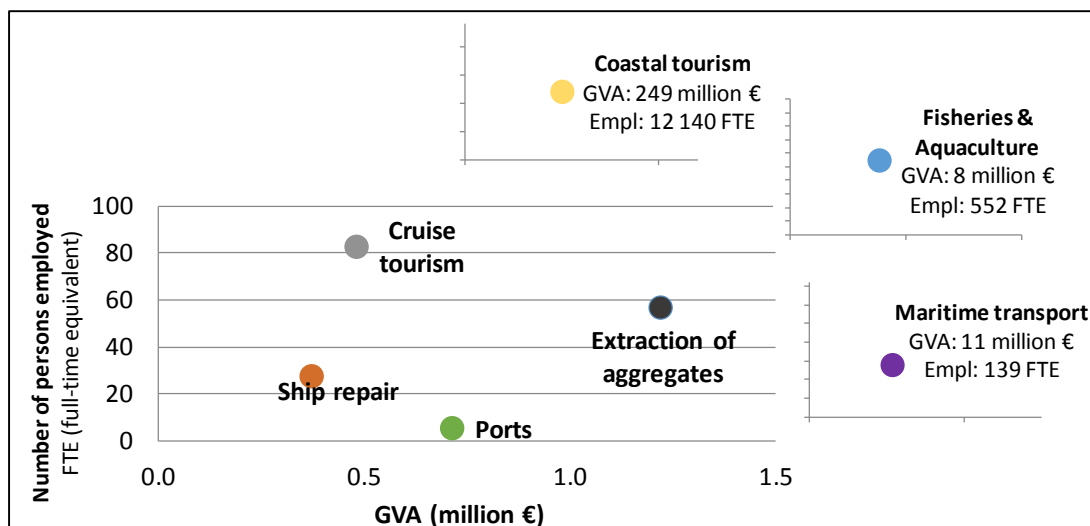
Figure 9 – Azores maritime activities and socio-economic impact



Source: our elaboration of INE – Instituto Nacional de Estatística, Sistema de contas integradas das empresas. 2014 data. Port employment data underestimate real employment.

In the Azores, the maritime activities having the highest socio-economic impact are fisheries and aquaculture, coastal tourism, maritime transport. Port activity has a remarkable impact in terms of value added, but in terms of employment, the real impact is underestimated. Extraction of aggregates and ship repair have an impact on employment, but are less relevant in terms of value added. Cruise tourism presents a low value, since it does not include effects generated by activity on satellite businesses.

Figure 10 – Madeira maritime activities and socio-economic impact

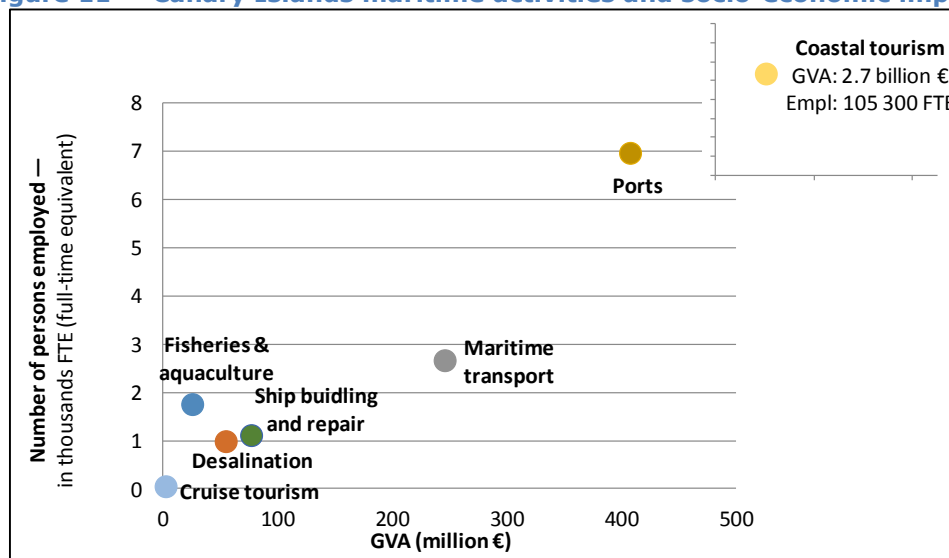


Source: our elaboration of INE, Sistema de contas integradas das empresas. 2014 data. Port employment data underestimates real employment.

In Madeira, the top three maritime activities having the largest socio-economic impact are fisheries and aquaculture, coastal tourism, maritime transport.

Other activities play a marginal role. Port employment is underestimated, while cruise tourism does not include indirect effects generated by satellite businesses.

Figure 11 – Canary Islands maritime activities and socio-economic impact



Sources: INE, ISTAC, MAGRAMA. 2014 data, except shipbuilding and repair (2013)

In the Canary Islands, coastal tourism is by far the most important maritime activity. Ports and maritime transport have also an important role, together with fisheries and aquaculture (at least in terms of employment). All others play a marginal role. Again, cruise tourism does not include indirect effects generated by satellite businesses.

Looking at future potential in terms of job creation and creation of value added, fisheries and aquaculture, cruise tourism, coastal tourism and shipping showed an important potential, considering that at present they constitute the backbone of the local economies of the Macaronesia sea basin ⁽¹⁰⁸⁾. On the other hand, two activities at a pre-development stage showed a remarkable growth potential in the near future

⁽¹⁰⁸⁾ For more details on future potential, please see Annex 12, chap. 9.

and could create important job opportunities and value added for the sea basin economy, namely **renewable energy** and **blue biotechnology**, although very limited information is available.

1.3.3 Findings of the needs analysis and best practices survey

The purpose of this paragraph is to report, for the most important maritime activities identified, the main findings of the **analysis of synergies and conflicts** between maritime activities. Furthermore, the main results of the **gap analysis** for the most important maritime activities will be reported at sea basin level and for each OR, classifying them as 'legislative', 'non-legislative' and 'financial'.

At the end of the paragraph, **key best practices and flagship projects** have been also reported for all activities, selecting them from the Annexes.

1.3.3.1 Fisheries and aquaculture

- **Main results from 'Synergies & conflicts' analysis**

In the **Macaronesia** sea basin, and more specifically in all ORs, important synergies have been identified between the fishery sector and coastal tourism, since the latter appears as a concrete alternative for diversifying the sources of incomes and increasing profits. On the other hand, the entry of fish captured by recreational fishers generates unfair competition with the professional sector, causing also additional and poorly monitored pressure on stocks.

In the **Azores**, the creation of marine protected areas reduces fishing areas already limited by natural constraints. Furthermore, the high variability in catches may hamper investments in the downstream processing industry.

Similar conflicts have been also identified in **Madeira**, where the conservation needs of marine biodiversity, together with the growing demand for natural resources and the creation of marine natural parks, generate conflicts with fishing activity, which suffers from a lack of biomass. Moreover, infrastructures dedicated to fishing activities are located in small ports, and are limited. They compromise the expansion of fishing activity, and cause undesirable interference with the movement of freight and passengers, as the movement of passengers is growing.

As regards the **Canary Islands**, fisheries and aquaculture have strong synergies in terms of sharing of marine space and port facilities. This has given rise to cooperation in the provision of Cofradías services to the aquaculture sector. However, concerns about the ecological impact of fish escapes from sea cages have been raised by the fishing sector.

Round tables have been promoted by insular governments to facilitate dialogue and cooperation, which include other activities such as recreational fishing. The regional government has created the advisory council of fisheries and aquaculture to promote a better governance of the fisheries sector, involving aquaculture, recreational fishing and scientific and academic institutions.

Finally, it should also be considered that the expansion of the aquaculture sector may contrast with other uses of the seas, such as coastal tourism.

- **Main results from the Gap analysis**

In the **Macaronesia** region, the gap analysis highlighted the lack of an effective monitoring, control and surveillance apparatus, for conducting surveillance of fishing activity in the waters of the sea basin in order to deter IUU fishing (**legislative gap**). In all territories of the sea basin, crews are aged, and in many cases, do not hold appropriate professional qualifications (**non-legislative gap**). Sound studies on abundance of deep water species are required, supported by a robust system of fisheries data collection. Technical developments to exploit deep-water species are required for supporting possible diversifications of targeted species.

A gap identified in the Canary Islands and Madeira is the lack of infrastructures to add value to algae production. Added value could be generated by exploiting biotechnology processes for achieving advantages in market niches i.e. cosmetics, food, pharmacy, etc.

A **financial gap** identified for each OR is the lack of private investments, and a parallel dependency on structural funds has been pinpointed. National public investment is scarce for the development of the fisheries sector in Cape Verde, which relies heavily on FDI.

In **Azores**, several **non-legislative gaps** have been identified. First of all, the poor qualifications of fisherman, with limited business management capacities, which hinder diversification possibilities offered in the OR (with maritime tourism). The sector is not attractive to young people, and there are difficulties in recruiting workers. Furthermore, infrastructures for supporting the development of storage types other than fresh are lacking, or concentrated only in the tuna segment, and there are no links between research and the sector (for stock management and product and process innovation).

Similar gaps have been identified in **Madeira (non-legislative gap)**, such as the limited knowledge about important issues, such as fish stocks and marine biology ⁽¹⁰⁹⁾, limited business management skills of fishermen, hindering diversification possibilities, lack of knowledge about on-board safety measures for fishermen and the lack of infrastructures dedicated to fishing activities.

Moreover in Madeira, traditional vessels used are small and aged, and do not ensure appropriate working conditions and safety measures on board.

In the **Canary Islands**, legislative, non-legislative and financial gaps have been identified. The fishery sector demands the allocation of a higher regional quota for the bluefin tuna, which is considered a species of high importance for the small-scale sector (**legislative gap**). As regards aquaculture, administrative processes are extremely long due to a scarcity of available space and environmental concerns. The granting of new concessions depends on the approval of the regional management plan for aquaculture (PROAC), , which has been under discussion during the last four years. Another **non-legislative gap** for the growth of aquaculture production is the difficulty in treating fish diseases due to the cost of importing medicines, transport times and customs procedures. This is related to the insularity and remoteness of the region ⁽¹¹⁰⁾.

The Canary Islands showed up — as identified in other territories of the area — weak generational replacement, likely due to the reduction of the fleet and the lack of economic attractiveness of the fleet (**non-legislative gap**). The main **financial** constraint in the Canary Islands is the excessive dependence on EMFF. Banks and other financial intermediaries do not offer ad hoc instruments for this activity. In addition, fisheries in general face high transport costs due to remoteness, insularity and double insularity. Compensation instruments seem to only partially cover the problem of transport costs.

1.3.3.2 Coastal tourism

- **Main results from 'Synergies & conflicts' analysis**

For the **Azores**, the synergies and conflicts analysis showed that coastal tourism sector is highly dependent on air transport. Furthermore, the existence of adequate connections among islands ensure a greater mobility of tourism flows, therefore

⁽¹⁰⁹⁾ Economic zone under ARM jurisdiction is insufficiently known, especially as regards the ecosystems of the deep sea and possible other species to be exploited.

⁽¹¹⁰⁾http://www.ipacuicultura.com/noticias/en_portada/33177/la_sanidad_acuicola_como_factor_clave_para_la_supervivencia_y_desarrollo_del_sector.html.

synergies between ferry passengers and coastal tourism are key for the expansion of coastal tourism.

Synergies between coastal tourism and ports have been identified in **Madeira** and, to a lesser extent, with ferry passenger transport: the former supports nautical tourism, the latter the movement of tourists among islands. On the other hand, coastal tourism generates high pressure on coastal areas in the Funchal area, since all accommodation and in general, coastal tourism activities are located in Funchal. In addition, protected areas and related restrictions outside this area increase the concentration of maritime tourism activities in Funchal.

Similar conflicts regarding the use of space have been identified in the **Canary Islands**. The expansion of coastal tourism has implications for other economic activities, such as fisheries and aquaculture e.g. use of the space and use of port facilities. In the future, conflicts might emerge between this sector and marine renewable energies due to the lack of marine space (narrow continental shelf).

Tourism has strong links with desalination activity. In fact, this has contributed to the development of tourism in many areas of the archipelago.

- **Main results from the Gap analysis**

At **sea basin** level, the gap analysis identified one main **non-legislative gap**, namely the poor qualifications of human resources involved in the sector. Training activities are being conducted to respond to demand, but there seems to be a lack of a steady offer of training. All ORs suffered from this gap. It is worth mentioning that visas are required for the transit of people between Cape Verde and the EU ORs, and viceversa. This may particularly affect ORs tourism and Cape Verdean students and workers willing to complete education and training in the ORs. This requirement may discourage transit of people due to the fees and other expenses associated with the granting of visas. The length of the visa granting procedures may also discourage visitors, especially for the case of business.

Furthermore, in the **Azores**, the planning and regulation of maritime space dedicated to recreational tourism is lacking, hindering the harmonious development of infrastructures for supporting nautical and sporting activities. The overall development of maritime tourism in the Azores should follow sustainability models, for the purpose of constantly ensuring a trade-off among (i) the development of different activities making up tourism, (ii) the creation of support infrastructures (e.g. ports, marinas, and other facilities) and (iii) the protection of environmental resources.

As regards **Madeira**, the main **non-legislative gap** identified (apart from staff training) regards the lack of mooring places in marinas for meeting the demand of ships stopping off at Madeira, especially for larger vessels. Security in marinas is limited, and there is an overall lack of space dedicated to ship repair activities and the dry parking of vessels. From a **financial** point of view, the accommodation sector is strongly indebted, preventing future reinvestments or modernisation of structures.

As regards the **Canary Islands**, a **legislative gap** has been identified concerning the development of legislative efforts to provide a legal framework for new activities. For example, pesca-tourism requires regulatory frameworks in order to avoid unreported activities, which can take the form of recreational fishermen doing pesca-tourism in recreational boats. Regarding cetaceans watching, the activity is regulated since 2000⁽¹¹¹⁾. It is worth mentioning that it is illegal to conduct the cetacean watching for tourism purposes without the proper permissions.

Energy and water supplies are two of the major problems generated by increasing tourist demand. These issues have been addressed successfully in recent decades, but

⁽¹¹¹⁾ Decree 178/2000 on the regulation of cetacean watching.

http://www.gobiernodecanarias.org/opencmsweb/export/sites/medioambiente/piac/galerias/des_cargas/Documentos/Biodiversidad/Cetaceos/Documentos_complementarios/Legislacion/Decreto-178-2000-0bs-cetaceos.pdf.

more could be done to have a higher availability of resources and guarantee sustainability.

1.3.3.3 Cruise tourism

- **Main results from 'Synergies & conflicts' analysis**

In the entire Macaronesia sea basin, vertical integration between cruise ship operations and other business interests could create synergies among activities and open the door for product diversification, for example by emphasising the link between cruise terminal operations and shore-based activities (i.e. shore excursions or cruise port resorts). On the other hand, cruise tourism is gaining an increasingly important role in port traffic, especially in congested ports such as Funchal (**Madeira**).

Drivers for the growth of the sector have been identified in infrastructural terms. **Madeira, Azores** and **Canary Islands** have increased plants and equipment for managing cruise ships, even if more efforts should be made to keep structures updated and consolidate cruise traffic (see results from the gap analysis below).

- **Main results from the Gap analysis**

In **Madeira** cruise ships are hosted in the new terminal built in Funchal. However, considering the attractiveness of Porto Santo, this island lacks of adequate berth facilities and other services for receiving cruise ships.

Similar infrastructural upgrades are needed in **Azores**, although recent developments in Ponta Delgada have raised the level of hosting facilities. Higher service standards are needed to improve the attractiveness of the sector, and should be extended to all (or at least more) islands of the archipelago.

The gap analysis for cruise tourism in the **Canary Islands** showed up the problem of seasonality (which has been observed in other ORs in the sea basin) and the lack of urban services and ad-hoc tourism offers for cruisers stopping in the archipelago. Furthermore, as also emerged in relation to coastal tourism, the lack of language skills is also considered a strong constraint, which needs to be overcome for raising the level of tourist offer.

1.3.3.4 Shipping

- **Main results from the 'Synergies & conflicts' analysis**

In general, considering the insularity of all territories in the **sea basin**, maritime transport and ports are of vital importance for the economic development of the sea basin. Networks of ports in the Macaronesia region are cooperating in the context of projects forming part of the Transnational Cooperation Programme for Madeira, Azores and Canarias (MAC programme) to improve coordination and knowledge transfer. Synergies between shipping and cruise and coastal tourism are also evident, since port infrastructures represent the backbone of nautical services and cruise ships.

In the **Azores**, passenger transport supports coastal tourism by providing inter-island transport services, while freight transport is (also) linked to demand trends generated by tourism flows. In general, the existence of adequate port infrastructures is deemed a basic requirement for the development of the blue economy (transport, cruise, coastal tourism, fishing, etc.).

The same synergies can be found in **Madeira** and the Canary Islands. In the former, synergies with coastal tourism in Porto Santo could offset the high seasonality of tourism on the island. Furthermore, the creation of the Funchal Cruise Terminal in the Funchal port is an added value for cruise tourism. On the other hand, conflicts over the use of maritime space still exist — although port specialisation is a practice that has been adopted — mainly because nautical tourism and recreational tourism are recording exponential growth, and need more space to deal with increasing demand.

As regards the **Canary Islands**, port expansion, or reorganisation, may have some implications for other activities such as fisheries, aquaculture or coastal tourism

(especially nautical services). Sound maritime spatial planning should be conducted in order to mitigate these conflicts.

- **Main results from the Gap analysis**

In the **Azores**, in terms of human resource qualifications in the sector, shipping and logistics management skills should be improved (**non-legislative gap**). The Sea School, which should soon be opened, could be the most appropriate venue for training personnel in shipping management. The frequency of ferry service connections between islands is not adequate to meet transport demands, especially in view of potential increases in tourist flows. Port infrastructures, although recently improved, need to be further adapted to cruise shipping and nautical tourism trends, considering that berth facilities for larger vessels are inadequate.

As regards **Madeira**, infrastructures in Porto Santo are not adequate for meeting passenger flows and hosting cruise stopovers on the island (**non-legislative gap**). As also seen in the Azores, there is a lack of qualified resources in shipping and logistics management and operational personnel in Madeira, needed for raising the quality of services provided.

From a **legislative** point of view, spaces in port areas are not managed and exploited in the most effective way, and conflicts could emerge when new activities need to be set up in port areas.

The main gap identified in the **Canary Islands** regards human resources for the sector (**non-legislative gap**). Generational turnover, particularly in relation to crews, is reported as a threat to the future of the activity, as young generations are not interested in seafaring careers, or in working in port areas. Although the sector possesses highly trained personnel, diversification and expansion of activities will require qualified personnel, especially in relation to offshore activities. Furthermore, the analysis spotted an overall lack of financial instruments for supporting maritime transport and port developments. The sector relies heavily on ERDF.

1.3.3.5 Blue biotechnology

There is no marine biotechnology activity as such in the sea basin. However, algae production in Madeira and the Canary Islands has a great potential to provide a basis for biotechnology activity aimed at providing inputs for the food, cosmetic and pharmacy sectors.

1.3.3.6 Marine renewable energies

The development of blue renewable energies in contexts characterised by high insularity is obviously considered strategic. However, the activity is at a pre-development stage, and initial projects carried out have not proved to be promising alternative sources of energy for the near future.

1.3.3.7 Main best practices and flagship projects surveyed

In this paragraph, the main best practices and flagship projects surveyed in each OR and at sea basin level are given. More details are available in chapter 3 of Annexes 7, 8, 9 and 12.

1. **ORs concerned:** Canary Islands, third country: Cape Verde.
Name of the project or practice: ALGABIOMAC.
Maritime activities concerned: Blue biotechnology.
Objectives: The main objective is the development of activities of exploitation, production, processing and promotion of seaweed (macro and micro) in Macaronesia. Other objectives are the development of cooperation actions and strategies in research, technological development that enable the viability and exploitation of these resources and of biotechnology companies.
Results achieved: Assessment, determination and extraction of bioactive substances, both microalgae and macroalgae regions of Macaronesia;

evaluation and technical and commercial characterisation of supercritical extraction of natural pigments, antioxidants (carotenes) and fatty acids (omega 3 and 6) of microalgae and macroalgae for the development of new industries; study of technical and commercial viability of the production of micro and macroalgae in Macaronesia; establishment of research networking in the region and training of specialists.

Reasons for considering it as flagship project: The project promotes R&D and technological development in order to provide a basis for future biotechnological activity. The project addresses one of the main needs in the field of Blue Growth, which is to determine the technical and commercial viability of the extraction of bioactive substances. This activity has the potential to add value to current microalgae production. The projects promote scientific and technical cooperation at the level of the entire sea basin, but similar initiatives could be extended to other ORs.

2. **ORs concerned:** Canary Islands, third country: Cape Verde.

Name of the project or practice: MAC PROF-CV.

Objectives: To evaluate potential new deep-water resources in Cape Verde, and to provide the basis for sustainable management and gastronomic evaluation.

Maritime activities concerned: Fisheries.

Results achieved: A deep-sea evaluation survey was conducted on the abundance of striped soldier shrimp and black scabbard fish in Cape Verde waters. In addition, the project conducted culinary events to promote the consumption of these and other fisheries resources.

Reasons for considering it as flagship project: This project is innovative since it explored potential resources to diversify the fishing activity and promote the further development of fisheries in Cape Verde. This initiative could be replicable in other contexts, where new or underexploited resources of potential commercial interests are available. The strategy employed in this project follows a step-wise process where sound evaluation takes place before starting exploitation. The project aimed not only to identify fishing resources but also to assess the viability of promoting their consumption. Further projects aimed at developing deep-water fisheries could address the building of capacity in data collection, management and control and surveillance. This is a need to be addressed in further initiatives to ensure sustainable exploitation of resources that due to its nature are especially vulnerable to overexploitation.

3. **ORs concerned:** Canary Islands, third country: Cape Verde.

Name of the project or practice: CANAUTIC.

Objectives: The platform for 'Canary Islands – Cape Verde Cooperation in nautical sports, socioeconomic and environmental diagnosis in relation to nautical activities', is aimed at promoting the sustainable local development of coastal areas of Cape Verde, while establishing a framework for the rational use of the coastal zone based on social, economic and environmental criteria.

Maritime activities concerned: Coastal tourism, Ports.

Results achieved: Socio-economic study of the Cape Verde nautical sector. Catalogue of Cape Verde nautical activities and advice for the development of the regulatory framework for nautical activity.

Reasons for considering it as flagship project: The project is a breakthrough in evaluating the potential of the Cape Verde nautical sector, and makes a meaningful contribution to its institutional development. The project could be replicable in other regions where nautical activity is incipient, if cooperation frameworks are in place with more developed regions to establish knowledge transference in technical and policy and regulatory matters. Cooperation between these two regions is active in marine and maritime matters e.g. the Maritime Cluster of the Macaronesia. The experience of the

- Canary Islands' project counterpart in an archipelago with physical similarities has facilitated the characterisation of the nautical activity in Cape Verde.
4. **ORs concerned:** Canary Islands, third countries: African countries.
Name of the project or practice: Las Palmas — Puerto humanitario.
Objectives: To coordinate resources and create synergies with international organisations to place the port of Las Palmas on the map of global humanitarian aid.
Maritime activities concerned: Ports.
Results achieved: General Assembly of African Women in the Port and Maritime Sector; creation of a master's degree in humanitarian logistics to be provided by the University of Las Palmas.
Reasons for considering it as flagship project: Las Palmas is one of the main ports in the region and has high relevance as a hub for humanitarian aid and in the field of knowledge transfer in port matters.
 5. **ORs concerned:** Canary Islands.
Name of the project or practice: *Grupo de Investigación en Acuicultura*.
Objectives: The group promotes a strategic vision of the aquaculture sector with products of high nutritional quality, innovation with sustainable diets, selection of species and multitrophic polyculture, encouraging a model of social and biotechnological development based on local species.
Results achieved: The group has developed and registered eight services, which comprise: analysis of nutritional value of aquatic organisms; models and genetic tools; histopathologic diagnosis; production of eggs, larvae and juveniles of diverse species; sensorial analysis of aquatic products; formulation and elaboration of feed; design and execution of aquaculture essays, among others. These services are offered to researchers, research and academic institutes and the private sector.
Maritime activities concerned: Aquaculture.
Reasons for considering it as flagship project: The group is an innovative good practice that capitalises scientific knowledge, know-how on productive processes and state of the art infrastructures to provide a wide array of products and services to the private sector and to researchers and other research institutions. Thus, not only does it back up industry with scientific expertise but it also builds capacity in the research and development realm. The model of the research group could be replicable in other contexts provided scientific expertise and adequate infrastructures are in place.
 6. **ORs concerned:** Azores.
Name of the project: POPA: Azores Fisheries Observer Programme.
Objectives: 'Dolphin safe' certification.
Maritime activities concerned: Fisheries.
Results achieved: 'Dolphin safe' certification.
Reasons for considering it as flagship project: in terms of innovation, the project has certified tuna fished in Azores, adding value to fishery production. This project should also be considered as effective and efficient, since it has generated a concrete output (i.e. sustainable fishing of tuna and tuna certification), and will also continue in the future. Furthermore, the project is also reproducible and transferable to other contexts.
 7. **ORs concerned:** Azores.
Name of the project: Marca Açores.
Objectives:
 - to promote and valorise Azorean products in domestic and foreign markets;
 - to encourage and promote a greater participation of regional companies in national and international strategic events;
 - to disseminate the Azores brand as a synonym and guarantee of quality;
 - to increase the visibility, consumption and notoriety of the products and services produced in the Azores at international level;

- to promote the expansion of the export-based economy by investing in all sectors that offer competitive advantages to sustain economic growth in the medium and long term;
- to gradually increase the value of exports and regional GDP.

Maritime activities concerned: All business in Azores.

Results achieved: The Azores brand has allocated around 1 500 labels to food products, services, establishments and crafts. There has been a significant increase in sales.

Reasons for considering it as flagship project: The project can be considered innovative, as it introduced a promotional brand for supporting the positioning of Azores production in national and international contexts. It produced an efficient and effective way of promoting Azores, assigning the label to a large number of products and services. The project will continue in the future. In general, the association of a product or service to a local brand is transferable and reproducible in other contexts.

8. **ORs concerned:** Madeira.

Name of the project or practice: Centro de Maricultura da Calheta.

Objectives: To develop production methods for biological juveniles of *sparus aurata* and certification according to EU regulations.

Maritime activities concerned: Aquaculture.

Results achieved: Still ongoing. It provides technical support to local producers with training and specialisation courses. It has a nursery of around 400 000 juveniles per cycle, with 3 or 4 cycles per year. It provides support for the sector and is an important basis for fulfilling the potential of aquaculture in Madeira.

Reasons for considering it as best practice or flagship project: the Centre introduced an important innovation in the archipelago, since it provides juveniles for farming activities. Therefore, considering the effective and efficient support to local farms, the Centre should also continue in the future. The creation of such a Centre is pivotal for developing farming activities, and is transferable and reproducible in other contexts.

1.3.4 Findings concerning the most relevant drivers and growth barriers

In this paragraph, the main findings of the analysis on 'Growth drivers and barriers' for the most important maritime activities are given, classifying them as 'legislative', 'non-legislative' and 'financial'.

1.3.4.1 Fisheries and aquaculture

Macaronesia — and ORs in particular — present several drivers that could lead the development of the sector in the future. There are, for instance, institutes conducting sound R&D, with ORs possessing R&D capabilities and training infrastructures, medium and higher education is available, national strategies for fisheries and aquaculture development are being carried out. Furthermore, cooperation at the level of the entire sea basin is being conducted to develop new fisheries e.g. deep-sea fishing.

On the other hand, the fleet proved to be aged (**non-legislative barrier**), implying negative effects crews' habitability and safety on board. OR markets prefer fresh fish, and this may impose a barrier for the development of the processing industry. As for aquaculture, the long administrative processes required for obtaining concessions are regarded as a strong limitation for ORs. From a **financial** point of view, there is a lack of credit granted by private financial intermediaries, also for renewing fishing vessels.

The Azores offers good conditions for attracting investments in aquaculture, through the 'accelerated licensing procedure' for installing plants and making them operational (**legislative driver**). Incentives are also available for commercial aquaculture (**financial driver**). Furthermore, both for fishery and aquaculture products, the presence of the 'Azores brand' is a useful instrument for promoting Azores production in the international market (**non-legislative driver**).

While the existence of scientific research could support the sector in terms of improving the quality and sustainability of water resources, the low academic qualifications result in a reduced management capability, and limited interest in diversifying activities (**non-legislative barrier**). There is a large number of small family businesses with weak management capacity. Pressure on deep-water species by artisanal fleet is noteworthy and the lack of rules for regulating the activity is a legislative barrier for the sustainable development of the activity.

Infrastructures and facilities in fishing ports, landing places and auction markets are out-of-date, and the conditions for quality preservation, control and traceability are inadequate.

In both the Azores and Madeira aquaculture sector, another barrier is the difficulty in accessing veterinary medicines for farmed species, which limits the ability to tackle possible fish diseases promptly.

As regards **Madeira** aquaculture, the availability of the Centro de Maricultura is pivotal for the development of the sector (**non-legislative driver**). It produces juveniles for active aquaculture companies, and is engaged in several R&D projects for the development of aquaculture in the ARM waters. On the other hand, heavy regional administrative burdens for the licensing and concession of spaces hinder the attraction of new investments (**legislative barrier**). Furthermore, the high transport costs between island and continental markets due to insularity (e.g. imported fish feed; exported aquaculture fish) reduce the competitiveness of the sector.

As regards the fisheries, an important growth driver is the presence of synergies with other maritime sectors, especially tourism (for possible diversification of activities) and ship repairs, but several gaps have been also identified, as reported in § 1.3.3.1. Among others, the reduced skills of fishermen in business management represent one of the main barriers that hinder the growth of the sector and the profitability of fishing activities.

In the **Canary Islands**, a great potential for the exploitation of deep-water species has been identified as a driver for allowing the growth of the sector. Research and development, especially that conducted by the research group of the *Universidad de las Palmas de Gran Canaria* (ULPG) has also shown the technical viability for the aquaculture production of high value species such as corvina. Technical viability in Senegalese sole and shrimp production has been demonstrated, and the first experiences have taken place in the region recently (**non-legislative drivers**).

Other species are also important for the sector in the OR, e.g. Bluefin tuna, which however offer restricted fishing opportunities (**legislative barrier**). Moreover, a general difficulty has been the regulation of the expansion of recreational and IUU fishing activities. While the fishery sector could be driven by the processing industry, this industry has lost its competitiveness, and has limited growth prospects (**non-legislative barrier**). Furthermore, the sector in general is not deemed interesting and attractive to young generations, with negative consequences on the availability of a local workforce.

With regard to aquaculture in particular, direct foreign and regional investments are discouraged by the long administrative time frames needed to obtain aquaculture concessions (**legislative barrier**).

1.3.4.2 Coastal tourism

The growth drivers and barriers analysis for the **Azores** showed up an availability of professional and specialisation schools in Azores, which could support the improvement of qualifications of staff employed in the sector. Another important **non-legislative driver** — but specifically referred to sailing and yachting — is the geographic position of the Azores, which makes the archipelago an ideal stopover for cross-Atlantic sailing and yachting trips. This could generate positive effects on coastal tourism not only due to the direct impact of sailors on the economy, but above all for the promotional consequences that these flows could generate. On the other hand,

inadequate infrastructures for large recreational vessels could hinder this driver (**non-legislative barrier**), especially if there is no synergic development of port infrastructures (**legislative barrier**).

Both in Madeira and Azores, an overall lack of cooperation between industry and the educational and training system has been identified, hindering the ability of training centres to meet the demand for qualified personnel from the sector.

In **Madeira**, conflicts among maritime activities in harbour areas could emerge due to a lack of space and a lack of maritime spatial planning (**legislative barrier**). With regard to nautical tourism, constraints have been observed in terms of sea access equipment and infrastructure to support nautical and recreational activities (**non-legislative barrier**). Furthermore, accommodation facilities and related services are concentrated in Funchal, and this factor limits the development of other areas. From a wider point of view, an integrated marketing tool (see § 1.3.5.2 for more details) for promoting coastal tourism in international market is lacking. This tool should also serve to coordinate the tourism offer and better adapt to demand.

As mentioned above, the **Canary Islands** highlighted a lack of adequate qualifications to meet the increasing and differentiated demand from coastal tourism (**non-legislative barrier**). There is indeed a general difficulty in adapting training programmes to the emerging needs of this sector, e.g. nature watching, nautical services. Furthermore, high seasonality hampers professionalisation in the activities performed. On the other hand, the archipelago offers a wide set of emerging activities in which the marine environment and its living and non-living resources are the main source of experiences (**non-legislative driver**). New cultural attractions, such as experiencing the way of life of coastal communities e.g. net making, *carpintería de rivera*, etc. are important drivers to be exploited for boosting the sector and generating a higher impact on the local economy.

1.3.4.3 Cruise tourism

At **sea basin** level, the existing level of cooperation among territories is a good driver for the growth of the sector; this **non-legislative driver** may be the most appropriate tool for tackling seasonality, but also for addressing the real needs of cruise lines when they call and stop in a port (in relation to the supply of port, urban and tourist services on land).

The lack of a structured offer at sea basin and at OR level could endanger the consolidation of cruise tourism in the area as one of the main components of the blue economy. Although investments have been made for improving facilities, coordination with cruise shipping lines should be sought, in order to adapt the tourism offer to cruiser demand.

In **Madeira**, a **legislative barrier** that could hinder the development of further port structures is the lack of a holistic vision of blue economy development in the port area, in terms of: (i) identification of appropriate structures and related positions to be developed; (ii) adoption of spatial planning practices; (iii) diversification of cruise ship landing points.

As regards **Azores**, the improvement of infrastructures in Ponta Delgada should be supported by other actions, spreading adequate infrastructures to more islands and offering other opportunities to cruise lines than a simple stopover during seasonal repositioning (**non-legislative action**).

Seasonality and lack of urban services and ad-hoc tourism offer for stop-overs are regarded as **non-legislative barriers** in the **Canary Islands** regarding this activity. Furthermore, the offer of urban attractions and services for cruisers stopping at the islands is considered inappropriate. Nonetheless, in the Canary Islands private initiatives, such as Association Cruises in the Atlantic Islands, put together relevant stakeholders with the aim of promoting new routes in the sea basin and alternatives to combat seasonality, which is a very good driver that could help the consolidation of activity.

1.3.4.4 Shipping

At **sea basin** level, the area benefits from a good supply of training services, especially in Canarias and Azores, in freight shipping, logistics and port operations, while in Madeira and Cape Verde training services are more limited, especially in relation to operational functions and shipping and logistics management. However, the good level of cooperation existing in the area — also within the Macaronesian Maritime Cluster, with the involvement of private and public actors from the three archipelagos — could act as a useful driver for boosting training in the area, supporting the exchange of skills and expertise.

As regards the **Azores**, apart from the main **driver**, consisting of its geographic position, the shipping sector might benefit from the existence of infrastructures for the distribution and supply of LNG, a good fuel alternative for vessels (to be developed). This driver, in addition to its location in the middle of the Atlantic, represents a competitive advantage compared to other ports in the area in raising its role to that of transport hub. Two main barriers are worth mentioning that could hinder the achievement of this objective. The first (**legislative barrier**) is the restrictive legislation for ports concessions, which basically makes it impossible to adopt different management port systems (mixed private-public harbours) and to attract private investments. The second, linked to the first, is the lack of interest of the private sector in investing in highly conflictual areas, where geographic factors create a total dependence on maritime transport. At present, spaces for moving goods and specialised facilities (e.g. gentry cranes, storage facilities, etc.) are limited. A **non-legislative barrier** identified in the Azores is the lack of cooperation between industry and the educational and training system. This not only generates an overall limited capacity of the educational system in meeting the sector demand for qualified resources, but also reduces the attractiveness of the sector among younger generations.

Important drivers have been identified in **Madeira** that could lead to the development of the sector. From a **legislative** point of view, an important investment programme has reorganised harbour infrastructures, leading to port specialisation, in order to avoid conflicts among maritime activities. Furthermore, public authorities intend to develop contracts with private operators for the construction, maintenance and operation of some infrastructure and maritime port facilities in order to enhance modernisation and efficiency (i.e. new port management, concessions, etc.). Operating conditions and efficiency of ferry connections with Porto Santo is a **non-legislative driver** for the growth of maritime passenger transport, and the existence of synergies between ferry transport and the tourism sector in Porto Santo (by the creation of travel packages) is a driver for further increasing the demand for ferry services.

Several barriers have been also identified. For instance, the development plans for port areas have not been submitted to an in-depth analysis of sea and wave dynamics, which make new infrastructures more 'exposed' to atmospheric conditions (**legislative barrier**). Furthermore, the lack of integration of commercial or industrial port activity with other activities, particularly those relating to recreation and water sports, and with the use of marinas by people, hinders synergies with coastal tourism. From an infrastructural point of view (**non-legislative barrier**), mechanical equipment for access to the sea (e.g. cranes, berths, etc.) is scarce and poorly maintained, and infrastructures to support nautical and recreational activities, especially for yachts over 25 meters, are also scarce. Weaknesses have been identified in complementary services to nautical and recreational activities, such as the repair and maintenance of vessels, with unavailability of docking stations, parking spaces, dry maintenance and support services. Also in Madeira, an overall lack of links between the educational system and the industry has been observed, limiting the creation of new jobs in the sector.

In the **Canary Islands**, although port services seem to satisfy current needs, the expansion of the offshore sector and of nautical activities will demand improvements

in port infrastructures (**non-legislative barrier**). Private initiatives, such as the maritime cluster of the Canary Islands, bring together relevant stakeholders with the aim of promoting blue growth (**non-legislative driver**). However, the key barrier to the growth of the sector seems to be the lack of generational turnover.

1.3.4.5 Blue biotechnology

This activity seems to be more viable in the **Canary Islands** and **Madeira**. Institutes in the EU ORs have conducted sound research and development on algae identification and production, which could drive the development of this activity. However, the high investment and transport costs may be a barrier for foreign investments.

It should be noted that microalgae production in Canarias and Madeira requires the use of brine and provision of CO₂. Expansion of this production to encompass a large biotechnology industry will require these inputs plus equipment to obtain bioactive compounds. Bioactive compounds are in increasing global demand from food, cosmetic and pharmacy industries. USA (Hawaii) and China are two of the world leaders in this sector. Finding a place in such a competitive market is costly, but natural conditions and qualified personnel constitute key inputs that are already in place and offer an opportunity to position the archipelago in a growing market.

With regard to the Canary Islands in particular, scientists, industrial engineers and aquaculture technologists constitute the human resources available for the development of the activity. Nonetheless, the activity will require training for specialisation. Labs and infrastructures are available to conduct algae identification and production research. Brine is a by-product of the desalination activity. This is an input of the microalgae production process, which forms the base for the potential blue biotech sector. Brine is abundant due to the presence of the desalination plants.

1.3.4.6 Marine renewable energies

The activity is conducted in **Azores** and the **Canary Islands**. As mentioned above, a remarkable interest in this activity has been observed in all ORs. However, the main barrier for its development is represented by its limited potential in the short term for becoming an effective source of energy. An in-depth assessment should be carried out for identifying concrete projects with sufficient financial sustainability. Due to the optimal wind regimes and R&D, production of offshore wind energy seems more viable in the Canary Islands, where efforts are being carried out to develop offshore windmills adapted to the physical conditions of the archipelago. Other forms of blue energy are also on the spot light i.e. wave energy but its commercial production seems hard due to technical difficulties. Nonetheless, these plants will require in-depth analyses for their correct positioning in order to limit or even avoid damage caused by atmospheric conditions. From this perspective, private investors might not be so attracted by the area for developing new facilities. This situation strongly hinders investments in the area.

1.3.5 Findings on activities with highest potential

In this paragraph, the main findings of the analysis about the potential of the main maritime activities identified are given, assessing for each of them its potential in terms of value added, employment and competitiveness. The detailed analysis is given in chapter 9 of Annexes 7, 8, 9 and 12.

1.3.5.1 Fisheries and aquaculture

In the **Macaronesia sea basin**, the fishing and processing sectors offer potential for employment for low and medium skilled workers. There is also a potential to diversify fishing activity, thus reducing pressure over resources, e.g. pesca-tourism. This activity will require a workforce with medium-level qualifications including safety on board, observation of marine mammals and birds, and cultural topics (as well as tourist management). In turn, aquaculture in the sea basin offers job opportunities for medium and high-skilled workers, since the growth of aquaculture may contribute to positive spillover effects on employment, conservation, transport, packing and

distribution. In terms of value added, the greatest potential in the area seems to be in Cape Verde, which is the most industrialised (in terms of the processing industry) sector and attracts FDI. The expansion of algae production provides opportunities for a biotechnology industry. This sector seems more likely to grow in the EU ORs due to the presence of sound R&D activities, although high investments are perceived as a constraint.

Potential resources such as deep-water resources for Canarias, shrimps and prawns for Madeira and other resources with high and low values have the potential to add value to the sector for fresh and processed products for human consumption and also for animal feed.

In the **Azores**, although not attractive for young people, the activity has job creation potential, taking advantage of possible training facilities (e.g. the Sea school). The attractiveness of the activity should be boosted by identifying new products and markets and offering new possibilities for fishermen and young people. New possible market opportunities (e.g. new positioning in the supply chain, new selling opportunities, etc.) should be identified, also by studying issues such as:

- new packaging techniques
- new distribution channels
- new markets
- fish traceability
- identification of a range of processed fish products
- conservation processes and packaging.

Aquaculture may complement fishing with sea products typical of the Azorean waters (e.g. barnacles), having a high potential for being competitive on the market.

The potential of the fishery sector in terms of job creation in **Madeira** is linked to the improvement of qualifications in business and tourism management, allowing vessel owners or new resources to diversify activities. Regional legislation should be reviewed in order to allow this kind of diversification. Aquaculture may generate spillover effects in terms of job creation in other sectors: transport, conservation, refrigeration, packaging, for both high and low skilled jobs.

The economic exploitation of shrimps and prawns of Madeira, despite limited stocks, could enrich the regional gastronomical base. Links between the fisheries sector and the HORECA (Hotels, Restaurants and Cafes) sector are a development opportunity (preparation, processing and packaging capacity in existing processing units). Synergies with HORECA should be sought for offering regular menus based on culinary specialties. Furthermore, an increased knowledge of fishery resources can stimulate fishing activity, which is at present characterised by a high seasonality. Unexplored fishery resources (small pelagic fish — mackerel, horse mackerel, etc.) could become low-cost raw materials for the processing industry, and could also be used for non-food use (e.g. aquaculture feeding).

Aquaculture has remarkable potential in terms of competitiveness, which could cover the transport costs incurred in bringing the production to continental Europe. This potential is represented by the time needed for fattening fish (about 2 to 4 months less compared to other Atlantic coasts of Europe). Partnerships should be established between farming companies in Madeira and distribution channels for ensuring sales of products over a longer time scale through sales contracts.

As regards the **Canary Islands**, the fishing sector has the potential for diversification e.g. deep-water species and pesca-tourism, but it does not necessarily mean more employment, at least in the extraction activity, considering that the fleet is being reduced in size. Deep-water resources arise as an alternative for diversifying the supply of fish. Fishing activity faces the problem of low generational turnover, restricting the availability of human resources. This activity has served as a relief valve in times of crisis, occupying idle workers from other sectors, who tend to return to their activities.

Aquaculture activity in turn has a potential for job creation, especially for workers with high and medium qualifications. Creation of employment is associated with new concessions, but currently this process is a long one, and depends on the approval of the sector's strategy. There is a technical viability of high value species such as corvina and Senegalese sole, and there is also good potential for the growth of microalgae production to satisfy foreign and local needs, should blue biotechnological activity start. In general, aquaculture products are already well positioned in the international market. Demonstrated technical viability for other species such as corvina and Senegalese sole provides opportunities for obtaining a larger share of the international market. R&D in aquaculture has achieved good levels in the Canary Islands. The University of Las Palmas de Gran Canaria (ULPGC) conducts research and provides scientific and technical support to the private sector and to the research and development apparatus in the region, and in Macaronesia as a whole. The ULPGC's *Grupo de Investigación en Acuicultura* (aquaculture research group) promotes a strategic vision of the aquaculture sector with products of high nutritional quality, diet innovation, selection of species and multitrophic polyculture. Particularly relevant is the project ECOAQUA, which develops the next generation of research on sustainable aquaculture in the EU, aligned with the Marine Strategy Framework Directive and Blue Growth. It develops aquaculture technology and science, promotes the creation of infrastructures, provides training to university and technical students and know-how exchanges within the European Research Area (ERA) and with the ORs e.g. staff mobility and networking. The support of Canarias R&D apparatus is an asset for the development of aquaculture activity at regional and sea basin level.

There are low expectations of growth in processing activities due to the local preference for fresh fish. Traditional forms of processing, such as fish in glass jars, could be of interest for foreign delicatessen markets. The sea basin market is particularly interesting for the commercialisation of fresh and frozen fish. Considering that most of the fish production of Cape Verde is processed and exported to markets in developed regions, a lack of fish supply may emerge in that archipelago. Exploitation of new species, especially deep-water species, to satisfy potential demand in Cape Verde and in the ORs is also a possibility as an alternative protein supply.

1.3.5.2 Coastal tourism

At **sea basin** level, the growth of the activity may increase labour demand. However, there seems to be a lack of a steady offer of training for low- to mid-level positions. New forms of tourism such as coastal culture, mammal and bird watching, etc. may require personnel with appropriate qualifications. Value added could be increased by diversifying the supply of tourism services. The old sun and beach model is currently being replaced by a more comprehensive use of marine spaces and its resources.

Considering that coastal tourism is the engine of Macaronesian economies, benefits deriving from its development are necessarily reflected on other blue activities that are directly or indirectly connected. Higher tourist flows would require increased imports of goods, new transportation services, additional energy resources and many other services aimed at meeting growing demand from tourists.

As regards the **Azores**, the archipelago is central in transatlantic pleasure boat traffic. Horta is one of the world's biggest marinas in terms of the movement of leisure boats. This is an advantage that could be further developed, and other Azores marinas could be boosted for the purpose.

Looking in general at coastal tourism, the potential to attract FDI is linked to the development of high standard hotels and resorts, nautical sports and chartering. However, the standards of accommodation facilities should be raised.

In **Madeira**, the development of the sector is linked to recreational and nautical tourism. Both activities require qualified staff, such as boat pilots, biologists, boat operators, teachers, whale and dolphin watching operators, tourist guides, naturalistic guides, etc. A brand could be created to promote recreational and nautical tourism,

but more in general to coordinate the supply of local services and improve positioning in the international market. The inclusion of Madeira in the Extreme Sailing Series Ocean Race might also generate important benefits to coastal and nautical tourism, as Madeira could become one of the most important sailing destinations in the world. Natural conditions create a competitive advantage compared with other European destinations, with recreational and nautical tourism possible all year round.

Value added could be created by exploring new forms of tourism linked to nature and related recreational activities (protected areas, visits to Selvagens islands, whale and bird watching, coaststeering, diving, etc.).

The expansion of the supply of coastal and maritime activities in the **Canary Islands** may provide more opportunities for value added and employment than the traditional sun and beach tourism model. New activities generate a need for services such as training, specialist shops, repair of marine craft, etc. A competitive advantage is that experience in this sector is high. However, higher qualifications and professional skills are required to satisfy a tourism sector with an increasing demand for new forms of recreational activities e.g. cultural activities, nature observation, etc.

The development of coastal tourism requires many trade-offs with other uses of the marine and littoral space. In turn, the growing number of tourists and uses of the littoral space will increase demand for all kind of services, especially water and energy supplies, where water is scarce and there is a high dependency on fossil energy.

It is worth mentioning that nautical activities in Cape Verde represent opportunities for economic growth and for cooperation in the entire sea basin. Progress has been made in the framework of the MAC programme in studying the potential of nautical activities in that archipelago.

1.3.5.3 Cruise tourism

In the **Azores**, the potential for employment is linked to satellite activities — e.g. coastal tourism and all related activities — that may benefit from cruise ship calls. Direct employment (or value added) generated by cruise ships is marginal compared to indirect effects on local economies. Potential in terms of value added relates not only to cruises crossing the Atlantic Ocean but also to the possibility of cruises around the archipelago Islands, with positive impacts in terms of related activities. Investments have been undertaken in port infrastructures and facilities: the Cruise Terminal in Ponta Delgada has stimulated the arrival of new cruise ships, but it is necessary to be competitive in terms of operating costs for ships and to be able to attract new tourist markets. The 'fly & cruise' concept can be developed in the Azores.

As regards **Madeira**, the archipelago is in a good position in the cruise sector, due to its competitive advantages (e.g. attractiveness of the region, tradition and knowledge of the activity, proximity to other ports and ease of integration in various circuits) that can allow the development of policies with ship owners and cruise operators. It is important to expand cooperation with Canary Islands, Lisbon and the Azores ports, and develop joint initiatives with major ship owners operating in this region.

In the **Canary Islands**, cooperation between cruise companies and tourist operators can create good synergies, especially in relation to the organisation of tourism services for stopovers at ports, cities or nearby natural attractions. The potential of generating indirect effects on the economy in terms of new jobs and value added is therefore linked to the type of services that the Canary Islands can provide to cruisers on land. Also in the case of the Canary Islands, cooperation with other archipelagos to develop circuits and related facilities and infrastructures, in combination with tourism operators, has the potential to improve competitiveness.

1.3.5.4 Shipping

Being in the crossroads of maritime routes, and having a privileged position in relation to three continents, the **Macaronesia** archipelagos have a great potential in international markets. Public funds are available for cooperation at the sea basin level

(MAC programme), which could support the synergic development of port specialisations in the area.

However, the growing demand for more qualified shipping services (including nautical tourism) highlights the lack of infrastructures and of qualified personnel in meeting the needs of this emerging activity. Human resources and infrastructures need to be kept constantly updated to ensure the development of the shipping sector and the blue economy in general.

In the **Azores**, the development of ferry transport could have a positive impact on employment by introducing more frequent connections among islands. The development of the Azores as a transport hub in the Atlantic could also have a large impact on employment, considering the number of services that could be developed (transshipment, free trade zone, bunkering, etc.) and the number of specialised and operational staff needed. The geographic position of Azores could be an important element for investors in developing transshipment facilities or other incidental services for maritime transport in the Azores. The future introduction of alternative fuels for ships (especially LNG) would further facilitate the rise of Azorean ports in the Atlantic, as a greater number of stopovers would be required for fuelling purposes.

While maritime transport in **Madeira** showed a limited growth potential (and the most relevant activity might be the development of passenger ferry transport between Porto Santo and Madeira), the adaptation of the infrastructure to new requirements, particularly concerning services related to tourism and nautical tourism, would increase port competitiveness. The value added of shipping in the local economy could be created by developing contracts with private operators for the construction, maintenance and operation of infrastructures and maritime port facilities, which can enhance modernisation and management efficiency.

In the **Canary Islands**, improvements have been planned for the Port Strategic Plan, such as increasing port infrastructures (i.e. Port of La Luz and future bunkering demand), improving human resources with better training, port spatial planning, developing the supply of commercial berths (docks) and sport facilities (pontoons). The growth of goods and passengers transport and of activities related to naval and nautical activities have positive implications for job creation, and there is a potential for job creation in relation to energy saving and efficiency on ships (LNG fuel) and in ports, and in relation to environmental management technicians. The construction of new port areas (marina, fishing and commercial) and port services has the potential to create a relevant number of direct and indirect jobs. There is still room for extra value added in goods transport, the naval sector, nautical activities and bunkering, among others. The storage of food products also provides an opportunity for growth e.g. storage of grain from South America.

1.3.5.5 Blue biotechnology

The activity is highly technology and capital intensive, thus potential employment opportunities would likely include university graduates and postgraduates and lab technicians. While the activity of microalgae production has little value added, the extraction of bioactive compounds could cause a significantly higher economic impact on local economies, as it is a high value-added activity.

In the **Canary Islands**, aquaculture technicians are already working on microalgae production (a branch of the regional aquaculture sector).

1.3.5.6 Marine renewable energies

The activity is still at a pre-development stage, but it has an important growth potential, not only because it could generate new jobs, but above all because it could help to reduce dependency on fossil fuels. Highly qualified engineers and scientists are available in ORs, especially in the **Canary Islands**. Several projects have been carried out, although the success rate is not high (see § 1.3.1.6 for more details).

The MAC R&D programme is available for the entire sea basin, and could represent a useful sector in which this potential could be further explored and refined, for the purpose of finding commercially viable and sustainable technical solutions.

1.3.6 Conclusions on concrete measures by type and timeframe

The analysis carried out at **sea basin level** and in **each OR** included in the area led to the following conclusions, which have been grouped into three sets (legislative, non-legislative and financial), depending on the type of needs and the possible intervention measures which might be undertaken to fulfil the potential of each activity at sea basin level and in each OR. A possible time frame has been indicated for each conclusion, namely (i) short to medium term, for actions which could require an implementation period of between 0-5 years and (ii) medium to long term, for actions which could require an implementation period of between 5-10 years.

More details on conclusions are available in chapter 14 of Annex 12 and in chapter 13 of Annexes 7, 8 and 9.

1.3.6.1 Fisheries and aquaculture

Legislative conclusions

a) Strengthening Monitoring, Control and Surveillance (MCS) cooperation

IUU fishing is becoming a problem for the Macaronesia region. MCS Cooperation at sea basin level seems necessary, in coordination with the relevant RFMOs in order to set up such a system in the Exclusive Economic Zones, or to coordinate market mechanisms that restrict or discourage the entry of IUU products into fish markets. Cooperation between the authorities, fishing sector and coast guards should be strengthened, following the examples of State port measures and market restrictions in place in diverse regions of the world. Efforts are being made, especially by the tuna RFMOs. Technological improvements, such as aerial vigilance, are being used in coastal areas of the Canary Islands.

This is a medium to long term action, and would require the involvement of Regional and National authorities and private stakeholders (e.g. local fishermen).

Geographic scope of conclusion: Sea basin level

b) Increasing control and monitoring of recreational fishing

As reported in § 1.3.3.1, the emergence of recreational fishing is also becoming a problem for the professional sector. Controlling these activities is particularly hard due to the large number of recreational fisheries and fragmentation of ports. In addition to putting pressure on resources, unreported catches may undermine stock assessments. Control of recreational activities in order to avoid the commercialisation of catches is required.

A study characterising recreational activity, identifying the main challenges of controlling activities at sea and access to markets should be conducted in order to draw up effective measures to restrict the commercialisation of catches.

Possible examples to follow are the measures implemented by the Canary Islands' fisheries Inspection services to control distribution channels to prevent the access of illegal fish into the distribution channels, which have contributed to discourage illegal trade. Nonetheless, control of commercialisation is a challenge due to the atomisation of the territory and the large number of landing sites. The New Zealand paper trail allows an effective control of fish distribution channels and provides an external example of successful implementation of a traceability measure.

This is a medium to long term action, and would require the involvement of Regional and National authorities (e.g. Inspection services) and private stakeholders.

Geographic scope of conclusion: Sea basin level

c) Development of maritime spatial planning

The coexistence of fishing with other uses of the seas, such as shipping and ports, coastal tourism, nautical activities, aquaculture and conservation requires sound maritime spatial planning. A study mapping uses and users of the marine and maritime space and proposing measures to activate maritime governance in the sea basin is required.

This is a medium to long-term action, and would require the involvement of Regional and National authorities and private stakeholders involved in maritime activities.

Geographic scope of conclusion: Sea basin level

d) Optimisation of administrative processes in aquaculture in order to facilitate investments

Administrative procedures to obtain aquaculture concessions in ORs are regarded as too long, and may discourage investments. A study identifying bottlenecks and conflicts of competences in the granting of concessions at OR level is required.

This is a medium to long term action, and would require the involvement of Regional and National authorities and private stakeholders.

Geographic scope of conclusion: Madeira, Azores and Canary Islands

e) Identification and adoption of measures for guaranteeing the sustainability of fishing

In order to safeguard the fragile biological resources of the Azores, environmentally sustainable fishing practices (already adopted by the Azores fishery sector) should be consolidated. This is an important step for guaranteeing the sustainable development of the fishery sector. Pressure on deep-sea stocks brought by the artisanal fleet is not fully sustainable, and specific measures should be adopted for guaranteeing the sustainability of this fishing practice. Possible steps to be undertaken to achieve these objectives could be:

- assessment of deep-sea stocks and identification of sustainable exploitation levels;
- rules for the appropriate management of resources and identification of measures for monitoring both exploitation levels and the pressure on stocks;
- creation of possible marine protected areas, with restrictions on the exploitation of resources;
- adaptation of the tuna fleet to available resources, introducing measures for the progressive reduction of the fleet or ensuring support for a possible diversification of targeted species and new activities.

In the Azores trawling has always been prohibited, longlining is prohibited within three miles of the coast and only the less intensive handlining is allowed. This has had a positive effect on the availability of resources in the Azores. The deep-sea fishery practised by the artisanal fleet should be better monitored and regulated.

This is a short to medium term action, whose approach should be ensured in the long term, to be activated by local administrations, supported by the central administration.

Geographic scope of conclusion: Azores

f) De-regulated licencing procedure for aquaculture in Madeira

The analysis highlighted that the administrative procedure for new farming activities is burdensome and difficult. For this reason, the licensing procedure and concession of spaces should be de-regulated, facilitating and supporting investments in aquaculture. Local administrations should re-examine the procedure for licensing and for allocating spaces for farming activities. This action should result from a preliminary analysis of procedures and identification of bottlenecks that are currently slowing down the

granting of concessions. A possible best practice to follow is the Azores licensing procedure. The Azores has introduced an 'accelerated licensing procedure' for installing plants and making them operational. The practice is still too recent for assessing the impact on the sector, however, it could be a source of inspiration for other licensing procedures.

This is a short to medium term action, which should be activated by local administrations.

Geographic scope of conclusion: Madeira

g) Introduction of specific rules licensing fishermen to carry out tourism activities

At present, commercial fishing vessels are not allowed to undertake tourist activity. This limit should be overcome by introducing specific rules for licensing maritime tourism. The introduction of rules for licensing fishing vessels to perform tourism activities is the first step. Obviously, fishing vessels should meet specific safety requirements for being licensed and hosting tourists on board. This means that a preliminary check on vessels applying for this licence should be done, considering that most vessels in Madeira are more than 20 years old, and are small vessels with few safety devices on board.

This is a short to medium term action, to be activated by local administrations.

A possible example to follow is in the Azores, where the diversification of fishing activities by employing vessels for tourism purposes has produced good results, considering the increasing number of vessels requesting tourism licences. Pesca-tourism in the Azores has reached a good level of development, and helped to create additional income for fishermen.

Geographic scope of conclusion: Madeira

h) Public-private consultations should be launched for exploring the possibility of tackling fleet renewal

Most vessels are more than 20 years old, and present constant safety problems for crews in Madeira. For the Canary Islands, the fleet is ageing (35 years old on average) and mostly comprises small-scale fishing vessels. Since EU policies and funding mechanisms do not cover fleet renewal, consultations between the private sector and national authorities could be launched to identify possible actions and funds, other than the EU funds, for renewing the fleet. Possible actions to be undertaken are:

- inventorying of the fleet currently needing renewal, in order to 'quantify' the type of investment needed;
- launch of consultations for exploring possible mechanisms other than EMFF for financing fleet renewal.

Consultations are a short to medium term action, and should be activated by local administrations, with the involvement of EU and national administrations, as well as all related stakeholders (fishermen).

Geographic scope of conclusion: Madeira and Canary Islands

i) Assessment of the viability of increasing the Bluefin tuna quota

As discussed in the gap analysis, fishing possibilities for key resources i.e. the bluefin tuna, are deemed to be poor. Revision of the allocation of key fishing resources requires ad-hoc technical studies to back up decision making. These studies shall address socioeconomic and sustainability criteria for the allocation of resources to regions, in line with Article 17 of the CFP.

This action should be activated by Regional authorities.

Geographic scope of conclusion: Canary Islands

j) Increasing the effectiveness of controls on IUU and recreational fishing

IUU and recreational fishing in the Canary Islands require more effective control mechanisms, considering that both are rapidly growing and are becoming an increasingly bigger control challenge. Control measures to combat IUU fishing are being improved, including aerial vigilance, but more should be done to completely eradicate IUU.

Studies should be funded to characterise and quantify the impact of recreational fishing, leading to the adoption of more effective measures to regulate recreational fishing.

This is a short-term action (which could have a long-term approach), to be activated by National and Regional authorities.

Geographic scope of conclusion: Canary Islands

Non-legislative conclusions

a) Better assessments of fishing resources and diversification of targeted species

The collection of scientific data, as well as related scientific research, should be improved to obtain better assessments of fishing resources and identify new species to be exploited. For instance, deep-water exploitation could be explored, provided that research proves that resources are abundant and that management measures are required and effectively implemented. This is particularly relevant for Cape Verde, where scientific capacity seems limited. ORs should therefore continue with EU funded cooperation projects for building scientific capacity in Cape Verde.

This is a medium to long term action, and requires the involvement of Regional and National authorities, research centres and academia.

Geographic scope of conclusion: Sea basin level, with special focus on Cape Verde

b) Promotion of local fish products at sea basin and regional level

The fishing sector faces the problems of remoteness and insularity, which increase transport costs and hinders competitiveness. The promotion of local fish products at sea basin and regional level would reduce dependency on imports, cut down transport costs and improve food security, adding value to boot. This action could be launched by identifying new niche markets at regional and international level, assessing the acceptability of new species and products, before introducing them into markets.

This is a medium to long term action and would require the involvement of Regional and National authorities, and private stakeholders involved in the supply chain.

Geographic scope of conclusion: Sea basin level

c) Support for generational turnover and raising the qualifications of fishermen

Broadly speaking, the fishing sector faces low generational turnover, and low qualifications of fishermen. In Cape Verde, aquaculture training is limited due to a lack of specialist schools. These issues hinder the competitiveness of the sector. In order to overcome this limit, the following measures could be taken:

- promotional campaign to inform youngsters about the opportunities provided by fishing and aquaculture activities;
- training for fishermen in managerial and other skills in order to promote entrepreneurship;
- cooperation with Cape Verde in training personnel and assistance in evaluating the technical viability of a training school;

- as regards the Canary Islands in particular, Cofradías and vocational training centres should take the lead in promoting this career, and other fishing modes, such as pesca-tourism.

This is a medium-term action, and could be supported by structural funds from a financial point of view. The action would require the involvement of Regional and National authorities, research centres and academia.

Geographic scope of conclusion: Sea basin level, especially in Cape Verde and Canary Islands

d) Training fishermen to diversify activities

Pesca-tourism and other activities for creating new diversification possibilities for crews and boats, e.g. observation of sea mammals, have the potential to create more jobs and reduce pressure on resources. Training for fishermen and other interested parties is required for these activities. Cooperation with Cape Verde could be of great benefit for that region. Actions to promote synergies between the fishing and tourism sectors could be supported in order to identify opportunities.

This is a short-term action, and would require the involvement of Regional and National authorities, research centres and academia.

Geographic scope of conclusion: Sea basin level

e) Diversification of activity and production

One of the main needs for the fishery sector in the Azores is the diversification of activities and production. Possible diversification could be:

- identification of new commercially viable target species and innovation of products to give value added to production (new packaging techniques, new distribution channels, new markets, fish traceability);
- diversification of activities (e.g. pesca-tourism, whale watching or other forms of maritime tourism).

Diversification could be supported by the creation of links between research and the sector (for stock management and product and process innovation).

A study could be launched for identifying possible new species with a market relevance. Furthermore, the use of the 'Azores brand' should be maximised for better positioning new possible species and products in the global market. Fishermen should be informed and supported when diversifying their activities, and training courses for this specific purpose should be arranged. Finally, through coordination, with the research world, the fishery sector could explore its potential, especially in terms of product diversification.

This is a short to medium term action, which should be activated by local administrations and private stakeholders.

Geographic scope of conclusion: Azores

f) Development of infrastructure facilities for supporting the fishery sector

Infrastructures and facilities in the Azores in support of the fishery sector should be developed, namely: (i) facilities in fishing ports, landing places and auction markets for the movement and management of products; (ii) facilities for improving the preservation, control and traceability of products. A study for identifying the main needs of the territory should be launched, defining key priorities (the infrastructures, activities and facilities specifically needed following diversification adopted in Azores). The findings of the study should be used for the planning and development of infrastructures and facilities in ports.

The same situation has been observed in Madeira. Infrastructures dedicated to fishing activities are located in small ports and are limited. They limit the expansion of fishing activity, and cause undesirable interference with the movement of freight and passengers, as passenger traffic is growing. Specialised infrastructures for fishing boats should be created, also in view of the possible diversification of fishermen's activities in tourism.

With regard to Madeira, an ad-hoc study should be carried out to identify the best positioning of ports and infrastructures, assessing natural conditions and best port management options.

This is a long-term action, which should be activated by local administrations.

Geographic scope of conclusion: Azores and Madeira

g) Training of fishermen in Azores and Madeira

Training and specialisation courses should be undertaken for fishermen and young people for:

- improving the business management skills of fishermen;
- improving safety conditions on board fishing boats, especially artisanal craft;
- presenting to fishermen possible diversification possibilities and creating an awareness of potential;
- supporting fishermen in concrete diversification actions (new species, new products, new selling opportunities, etc., but also new activities, e.g. pesca-tourism);
- Attracting young people to the sector.

The Azores have competitive advantages for this action, as the Sea school may be the most appropriate venue for organising these training courses. Although Madeira does not have a training centre, the 'broadening' of the range of activities to the Centro da Maricultura should be explored.

Fishermen and young people (through the schools) should be encouraged to attend these courses, proposing them as concrete opportunities by diversifying activities. Fishermen should be supported in the diversification of their activities, following them up throughout the process and monitoring their status even after the new activity has started.

This is a short to medium term action, which should be activated by local administrations, involving private stakeholders (fishermen) and young people.

Geographic scope of conclusion: Azores and Madeira

h) Improving access to veterinary medicines for aquaculture

For small companies in particular, access to veterinary medicines and medical feed for the aquaculture sector in case of specific disease takes too long, affecting the profitability of production. Once the medicine is prescribed by the veterinary, the time needed for medicines to arrive could be too long, especially if medicines are not available in the region. In addition, customs procedures may increase time frames considerably.

A study investigating the distribution chain of medicines could be conducted to identify critical points that would need to be addressed to speed up the distribution of pharmacy products. Furthermore, in order to reduce medicine acquisition times, specific contracts should be agreed with feed providers for reducing the time needed to receive the requested materials. Finally, more active dialogue and cooperation among farmers could help to create a 'critical mass' and improve the demand for medical feed from ORs.

This is a medium to long term action, that should be activated by local stakeholders, and more specifically by fish farmers.

Geographic scope of conclusion: Sea basin level, and specifically Azores, Madeira

and Canary Islands

i) Development of aquaculture in the Azores

The study highlighted the potential for the development of the sector, which could focus on the following species:

- gilthead seabream
- other seabreams
- amberjacks
- barnacles.

The latter in particular, a high value product, could be used to complement fishing activities. However, the overall lack of know-how about farming techniques and licensing requires the organisation of specialist training courses for personnel or fishermen undertaking this activity.

Promotional campaigns should be launched for attracting FDI in aquaculture, promoting incentives made available in the Azores for the development of the sector, such as the 'accelerated licencing procedure'. The Azores brand could be used for promoting aquaculture production, and courses should be organised for training personnel or supporting business development in this sector.

This is a short to medium term action, which should be activated by local administrations and involve private stakeholders and young people.

Geographic scope of conclusion: Azores

j) Better knowledge of resources & exploitation of new species

Better knowledge of resources is needed for monitoring the sustainability of resources currently fished. Furthermore, the exploitation of new species should be investigated in order to reduce fishing seasonality and the pressure on traditional species. Possible new species could be:

- deep-water species, whose commercial potential has not yet been explored;
- small pelagic fish — mackerel, horse mackerel, which could be used for feeding farming plants or supplying the processing industry;
- shrimps and prawns from Madeira, despite limited stocks, could enrich the regional gastronomical base.

A research centre for monitoring the exploitation of resources and exploring new species should be created. These research functions could be integrated in the 'Centro de Maricultura' in Calheta.

This is a long-term action, to be activated by local administrations.

Geographic scope of conclusion: Madeira

k) Shortening of the supply chain, offer of products to HORECA sector

This could be an opportunity for increasing fishermen's and farmers' earnings, and the HORECA sector could also benefit from higher quality products and new local culinary specialties. Possible measures to implement this action could be:

- Creation of a 'round table' allowing the matching of supply and demand of fishery products;
- Creation or identification of culinary specialties to be fostered in HO.RE.CA.

This is a short to medium term action, to be activated by fishermen and farmers and involving the HO.RE.CA. sector.

Geographic scope of conclusion: Madeira

l) Strengthening promotional activities for attracting FDI in aquaculture.

Possible elements to be used for attracting investments are:

- the favourable natural and climatic conditions, reducing fattening times;

- favourable natural conditions could cover additional costs for transporting products to the mainland;
- possible use of compensations funds for covering competitiveness gaps with products in the mainland;
- existence of the 'Centro de Maricultura' in Calheta to support the sector with juveniles and other types of support;
- fish feed could be produced in Madeira exploring the catching of species with low value;
- specific agreements with distribution channels should be explored, since big companies could be willing to seek upstream integration in the supply chain.

Specific promotional campaigns should be launched using international communication channels and participating in events. The development of non-food uses for industry (producing fish meal) should be explored and supported. However, licensing and concession procedures should be simplified (see point f) in legislative measures).

This is a short to medium term action, to be activated by Public authorities at local level.

Geographic scope of conclusion: Madeira

m) Exploitation of deep-sea resources in Canary Islands

Exploitation of deep-sea resources offers alternatives to traditional fishing resources, requiring technological improvements in gear technologies and market research to identify market niches at a regional and international level. Possible measure to implement could be:

- studies on the technological characteristics of the fleet and analysis of viability of new technologies to harvest deep-water species;
- identification of market niches at regional, national and international level;
- commercialisation of these species, especially to satisfy local demands for fresh fish.

This is a medium-term action, to be activated by private stakeholders and regional authorities.

Geographic scope of conclusion: Canary Islands

n) Simplification of administrative procedures for aquaculture in Canary Islands

The growth and diversification of aquaculture activity is subject to long administrative procedures for obtaining aquaculture concessions, which discourages investments. A critical issue is the delayed approval of the PROAC. Administrative processes need to be simplified. Possible measures to implement could be:

- revision of the administrative apparatus and the overlapping of competences among administrations;
- implementation of a one-stop administrative office to process concession requests and other administrative requirements.

This is a medium-term action, to be activated by regional authorities.

Geographic scope of conclusion: Canary Islands

o) Re-launch of the processing sector in Canary Islands

The processing sector has declined due to the end of key access agreements. In addition to the strong regional preference for fresh fish, the availability of foreign products has limited its development. Studies should be funded to identify market niches for traditional fish preparations in regional and international markets. Furthermore, technical viability and market possibilities for new products based on deep-sea species should be also analysed through specific studies. The development

of R&D in the area of fish processing should support both measures reported above, and in general can sustain the re-launch of the processing sector.

The measures described above could be activated in the short to medium term, and should be supported by private stakeholders and Regional authorities.

Geographic scope of conclusion: Canary Islands

Financial conclusions

a) Support for granting credit to fishermen

OR fishing and aquaculture sectors are heavily dependent on structural funds. Ad-hoc private financial instruments are not provided. Measures at the level of ORs should be carried out to counteract this problem. Governments could look into the possibility of backing up investments by negotiating preferential interest rates and guarantees with financial intermediaries.

Geographic scope of conclusion: Azores, Madeira and Canary Islands

1.3.6.2 Coastal tourism

Legislative conclusions

a) Improvement of coordination at sea basin level for new tourism activities

New tourism activities, encompassing a more comprehensive utilisation of the marine space and appreciation of its natural resources, e.g. whale and bird watching, diving, exploration of seamounts and reserves, etc., may require coordination efforts among OR governments, the Cape Verde government and the private sector, represented by the Macaronesia Maritime Cluster to adopt harmonised practices at the level of the entire sea basin. Coordination among the regions concerned should be undertaken in order to establish knowledge exchange and set up best practices for this kind of tourism. Due to its broad geographic coverage and involvement of key actors, the Maritime Cluster is well placed for leading this initiative.

It is a medium to long term action, requiring the involvement of regional authorities and the Maritime Cluster.

Geographic scope of conclusion: Sea basin level

b) Ensuring a trade-off between development activities and environmental protection

A constant trade-off should be ensured for (i) the development of different tourism activities, (ii) the creation of support infrastructures (e.g. ports, marinas, other facilities) and (iii) the protection of environmental resources. Each development action should be assessed focusing on its environmental sustainability, considering that the Azores' main asset is its natural environment, and the preservation of this resource is pivotal in any development policy.

Specific rules should be adopted based on the preliminary assessment of environmental impact.

No time frame is envisaged, since it is a practice to be adopted for all development activities by local authorities intending to launch development activity impacting on the environment.

Geographic scope of conclusion: Azores

c) Better planning and regulation of maritime space dedicated to recreational tourism

The analysis of synergies and tensions among maritime activities showed that coastal tourism is often at odds with other activities regarding the use of space. For this reason, the planning and regulation of maritime space dedicated to recreational tourism should be enhanced and coordinated with other activities. Maritime spatial planning should be developed by local authorities in coordination with the economic actors involved. This practice has proved to be the most appropriate solution for solving conflicts among activities sharing the same space.

This is a short to medium term action, which should be undertaken by local authorities and should involve stakeholders.

Geographic scope of conclusion: Azores, Madeira and Canary Islands

Non-legislative conclusions

a) Improving the qualifications of personnel involved in the sector

Enhanced qualifications are required to satisfy the new needs of tourism activity. This is required for mid- and low-skilled personnel. In the case of emerging tourism activities, new qualifications are required for tourist guides and operators in the field of observation of marine life and the environment. The growth of the nautical sector requires marina administrators. Promotion of cultural activities in coastal communities requires qualified personnel. In the ORs, new needs will require complementary training and certification for new tourist activities in order to develop competitiveness and deter the emergence of informal operators. The level of staff qualification in all branches of 'traditional' coastal tourism (accommodation, services to tourists, entertainment, etc.), should be also improved, adapting to demand in the sector.

These initiatives should be transferred to Cape Verde within the framework of the MAC programme.

To achieve this aim, life-long learning courses should be created, for training staff involved in the tourism sector. Specific training centres (e.g. the Sea school in the Azores) could be the most appropriate venue for this purpose.

As the analysis showed, it is also essential to strengthen cooperation between the industry and educational and training systems. The industry should work closer with training centres in order to better meet market needs and the demand for qualified personnel.

Furthermore, the industry should be more involved in the promotion of 'blue' careers in order to attract new resources to training centres and for 'blue' job opportunities.

This is a medium to long term action that could be supported by structural funds from a financial point of view. It requires the involvement of regional authorities, training centers and private stakeholders.

Geographic scope of conclusion: Azores, Madeira and Canary Islands

b) Development of a new approach for coastal tourism in the Azores

The Azores have not been, up to now, a vacation destination for families with children, with most of the tourist flows originating from the mainland. While this segment could potentially be kept, a diversification of supply — by exploiting the potential of the Azores' assets — should be pursued by:

- identifying new markets (not only Portugal);
- mitigating seasonality by identifying new attractions in other periods of the year, such as congress centres, golf and nautical tourism;
- investments in four and five-star resorts, raising accommodation levels to international standards;
- fostering rural tourism;

- developing other maritime tourism activities (i.e. shark diving and swimming, diving with manta rays (*Manta* and *Mobula*) and whale sharks (*Rhincodon typus*), near seamounts).

The diversification of tourist services and their adequate promotion should start by analysing in-depth all possible tourism potential, in order to adequately direct tourism investments and communication. Local actors, supported by local authorities, should identify possible synergies and concentrate their efforts in achieving these goals. Diversification strategy should be also supported by an appropriate communication action, looking at the global market as a possible recipient of these actions (but focusing in particular on Europe and America).

The launch of the action could take place in the short to medium term, and should be activated by local authorities, involving all private stakeholders interested in developing new tourism services.

Geographic scope of conclusion: Azores

c) Supporting the diversification of tourism services in Madeira

Diversification called for by new tourism demand that can be met in Madeira includes:

- search for natural elements (landscape fauna, flora, etc.);
- coastal sports and maritime activities (whale watching, scuba-diving, surfing, bodyboarding, windsurfing, stand up paddling, recreational fishing, underwater archaeology, coastering);
- sailing and the recent inclusion of Madeira in the Extreme Sailing Series Ocean Race could generate further benefits for sailing and yachting flows to the archipelago.

A brand could be created to promote recreational and nautical tourism, but more in general to coordinate local tourism services and improve its positioning in the international market. Moreover, the quality of services provided should be improved, especially accommodation facilities (e.g. introducing the certification of accommodation activities) and staff qualifications. Administrative burdens for licensing maritime activities (especially for fishermen) should be reduced, and the synergic development of maritime spaces in port areas for different activities, sharing the same spaces and infrastructures, should be sought.

This is a short to medium term action, which should be activated by local authorities and sector stakeholders.

Geographic scope of conclusion: Madeira

d) Reducing the pressure of coastal tourism on the Funchal area

Almost all accommodation facilities are concentrated in Funchal, where the most important marina, services related to tourism, airport, etc. are all located. Tourism development plans should be spread over a wider area in Madeira and in Porto Santo, reducing the pressure on spaces in Funchal.

An ad hoc study should be conducted to explore new areas for developing tourism in Madeira.

This is a short to medium term action, which should be activated by local authorities.

Geographic scope of conclusion: Madeira

e) Enhancement of water and energy supplies (generated by higher demand from tourism)

The tourism sector in general faces the problem of infrastructure obsolescence. High water supply requirements and energy efficiency needs are evident. Desalination of seawater has been of key importance for the growth of the sector, and will continue to be a key driver for development. Renewable energies, among them blue energies, will arise as an alternative to high dependency on fossil fuels.

Desalination capacity is being expanded. R&D in blue renewable energies should be conducted to make them commercially viable.

This is a medium to long term action, to be activated by Regional authorities.

Geographic scope of conclusion: Canary Islands

1.3.6.3 Cruise tourism

Non-legislative conclusions

a) Reduction of seasonality effects and coordination of interests in the sector.

Seasonality in cruise tourism needs to be counteracted with innovative tourist products and new routes. Cooperation at the sea basin level needs to continue. Stretching ties with tour operators is required to offer complementary services for cruise stopovers, such as excursions and resorts.

In the Azores, the coordination of interests and efforts among different stakeholders involved in the sector should be strengthened in order to allow the territory to better meet the needs of cruise ships calling at Azores ports and to keep passengers for longer stays. For this reason, cooperation at the sea basin level, e.g. Association Cruises in the Atlantic Islands, and Maritime Cluster, should be reinforced. Synergies with tour operators should be identified, with the supply of complementary tourism services and attractions, extending the length of stopovers.

A round table could be created, involving cruise lines and local stakeholders, allowing archipelago supply to meet cruise ship demand.

This action could be implemented in the short to medium term and should be initiated by local authorities, involving local stakeholders, cruise lines and the Maritime Cluster.

Geographic scope of conclusion: Sea basin level, especially Canary Islands and Azores

b) Enhancement of infrastructures for cruise vessels in Azores.

Better infrastructures are needed to ensure adequate berthing for cruise ships calling in at the Azores. The round table mentioned in point a) above could also serve to identify the possible needs of cruise lines in terms of infrastructures.

This is a long-term action, which should be activated by Local authorities working closely with cruise companies. Ports should play a pivotal role, since spaces dedicated to cruise operations should be developed taking into account the needs of other activities. See also the conclusions given in the Shipping chapter.

Geographic scope of conclusion: Azores

c) Development of micro-cruises in the Azores

Considering that each island has its own attractions, the archipelago could provide useful solutions for developing 'micro-cruises', namely cruises around the archipelago islands. Micro-cruises have been successfully tried out in many locations worldwide, and could be undertaken using different types of ships. The solution would not require significant investments, since cruises would take place on yachts with a limited number of cabins. As a first step, possible investors interested in such cruises should be identified, then these cruises should be adequately promoted, in part through institutional channels.

Local authorities should stimulate the development of the practice, ship owners (also from Europe) should be interested in investing in this type of tourism in the Azores. This could be a short to medium term action, providing investors are interested in such investments.

Geographic scope of conclusion: Azores

d) Consolidation of Madeira's position in the cruise segment

Cruise tourism enables Madeira to offset traditional tourist-based seasonal cycles. For this reason, the position of Madeira in cruise tourism should be further consolidated by:

- developing joint initiatives with major ship owners operating in this region;
- increasing cooperation with Canary Islands, Lisbon and Azores ports;
- creating synergies and product diversification, for example by emphasising the link between cruise terminal operations and shore-based activities (i.e. shore excursions or cruise port resorts);
- improving infrastructures in Porto Santo to increase cruise ship stopovers.

To achieve these objectives, a permanent negotiating table could be set up, involving cruise companies, local authorities of Macaronesia and stakeholders, in order to better meet the demand of cruisers and increase the attractiveness of services supplied.

The action should be activated in the short to medium term, while the approach to be followed should be longer term.

Geographic scope of conclusion: Madeira

1.3.6.4 Shipping

Legislative conclusions

a) Enhancement of cooperation among port administrations within the sea basin

Enhanced collaboration is needed between regions regarding logistics, service standards and technological progress. Possible measures to be undertaken include the establishment of a permanent network for collaboration, sharing of knowledge and experience, implementation of common projects and training of personnel. Ports in the sea basin already cooperate through the MAC programme, but there is still a need for further cooperation.

This is a medium to long term action, which needs the involvement of regional and national authorities, and private stakeholders.

Geographic scope of conclusion: Sea basin level

b) New port management models

As the analysis revealed, the port management model in Azorean and Madeiran ports is public-driven. An analysis for exploring possible alternative port management models should be carried out in order to attract foreign investments and develop infrastructures. Private investments could help to support the construction, maintenance and operation of some infrastructure and maritime port facilities.

Public authorities should launch a study for assessing possible alternative management models for Azorean and Madeiran ports. The final step (long-term action) would envisage the adoption of the most appropriate model for developing needed infrastructures.

Geographic scope of conclusion: Azores and Madeira

c) Planning spaces for blue activities in port areas

Considering the limited spaces in Madeira ports, adequate management of spaces and infrastructures should be developed, to be integrated within the specialisation model developed in the Archipelago.

Major integration should be sought between existing specialisations and:

- fishing activities
- recreational tourism (originating from diversification activities of fishermen or others)
- nautical tourism
- ship repair.

The purpose of planning activity is to mitigate potential conflicts in the use of maritime spaces and create the synergic development of port areas. The local administration should create a negotiating table involving all possible actors involved in maritime activities in port areas and identify the key priorities and needs of different stakeholders. These needs should be included in the broader context of the modernisation of port areas with a view to the development of new Blue activities. Funding sources should be sought through the intervention of private capital, involving private investors in the management of ports (see conclusion of point b) above).

This is a short to medium term action, which should be activated by local administrations, involving stakeholders of the blue economy around the port area.

Geographic scope of conclusion: Madeira

d) Studies for assessing the optimal positioning of infrastructures for limiting the adverse impact of atmospheric conditions

The development of port infrastructures should be backed by specific studies assessing the optimal positioning of infrastructures for limiting the adverse impact of atmospheric conditions (storms, waves, tides, etc.). This type of study should be carried out before undertaking any type of infrastructural development in port areas. The in-depth assessment of atmospheric conditions in order to identifying the best infrastructural alternative should always be carried out before any investments are allocated.

This practice should be adopted in all circumstances in which new infrastructures are envisaged.

Geographic scope of conclusion: Madeira

Non-legislative conclusions

a) Raising the qualifications of staff employed in maritime transport and port activities.

Transport and port activities need qualified personnel, especially in shipping and management logistics. It was seen that the workforce is not sufficiently trained in Madeira. In the case of the Canary Islands it seems that the workforce can currently satisfy needs, although the expansion of activities, e.g. offshore activities, will require more qualified personnel. In Cape Verde activity is very limited. Efforts should be made to promote sea careers and incentivise generational turnover.

Cooperation among all territories and ports in the sea basin should be strengthened, in order to supply training in shipping and logistics management. As the analysis showed, it is also important to strengthen cooperation between industry and educational and training systems. Industry should work more closely with training centres in order to better meet market needs and demand for qualified personnel.

Furthermore, industry should be more involved in the promotion of blue careers in order to attract new resources to training centres and blue job opportunities.

The Maritime Cluster of Macaronesia is well placed to promote these activities.

Geographic scope of conclusion: Sea basin level

b) Increasing the number of connections to support tourist movements

As regards passenger ferry transport, the gap analysis highlighted the fact that more connections should be scheduled in order to support tourist movements among islands, also outside seasonal peak times. In order to do this, a preliminary analysis of demand and a costs-benefit analysis should be conducted to identify the sustainability of introducing new connections. Additional connections could be proposed and implemented only if deemed necessary. The use of EU funding could support the development of the sector.

This is a short to medium term action that should be undertaken by ferry companies.

Geographic scope of conclusion: Azores and Canary Islands

c) Improvement of infrastructures dedicated to ferry, cruise and nautical services in the Azores

As regards passenger ferry transport, the analysis highlighted the difficulty of managing passenger flows during seasonal peaks. Better infrastructures should be developed for managing passengers during these periods.

With regard to cruise and nautical demand, infrastructures need to be further adapted to increasing and changing demand from cruise and leisure tourism. The number of berths was not sufficient to meet current demand.

The Azores occupy a central position in the transatlantic traffic of pleasure boats. Horta is one of the world's biggest marinas in terms of traffic. This is an advantage that could be further developed, and other Azores marinas could be expanded for this purpose. Further infrastructure facilities should be developed in marinas to support boats and their users.

An analysis to identify bottlenecks and define infrastructural needs should be carried out. The relative findings of the analysis should be used to plan for and develop infrastructures. The ERDF could be a useful source for funding this type of investments.

Another element should be considered. Azores ports are 100 % public. An analysis of possible benefits achievable by involving private actors in port management should be conducted, considering that private investments could support the development of infrastructural facilities (see also point b) in Legislative conclusions above).

This is a long-term action, which should be activated by local and national authorities.

Geographic scope of conclusion: Azores

d) The Azores as a transport hub in the Atlantic

With regard to freight transport, the Azores could become a transport hub in the middle of the Atlantic serving as a platform for cargo distribution from/to Europe, but also from/to North and South America and Africa.

The future development of LNG-propelled vessels (which would need more frequent refuelling) could further strengthen this position. Possible measures to be undertaken in this respect are:

- comprehensive analysis for better defining the potential role of the Azores in the Atlantic;
- identification of possible cargo segments which could be developed;
- a strategic vision to be adopted by public authorities;
- development of infrastructural facilities for the movement and storage of goods (warehousing, cranes, possible free trade zone, etc.);

- attraction of FDI for concessions (greenfield, brownfield, landlord, etc.) in port area;
- strengthening of LNG facilities for bunkering purposes.

This is a long-term action, which should be activated and managed by Local and National authorities.

Geographic scope of conclusion: Azores

e) Improvement of infrastructures dedicated to nautical and recreational tourism in Madeira

In the Funchal marina in particular, but in the entire archipelago in general, there is a long waiting list for renting mooring places. The following actions should be planned for supporting the development of nautical tourism:

- development of mechanical equipment sea access (e.g. cranes, berths, etc.);
- development of berthing facilities for yachts over 25 meters;
- maintenance of structures currently available;
- development of docking stations, parking spaces, dry maintenance and support services;
- support for implementing complementary services to nautical and recreational activities (e.g. ship repair).

A change in the port management system could bring private capital to support these investments.

In order to undertake the actions proposed, a private-public round table with all stakeholders potentially involved in port activities should be created to identify priorities and needs. Furthermore, possible port management alternatives could be identified (see point b) in legislative conclusions) in order to attract private investments. Obviously, before launching any infrastructural development, a preliminary study should be carried for assessing what type of infrastructural facilities should be developed, bearing in mind atmospheric conditions.

This is a long-term action, which should be activated and managed by local administrations.

Geographic scope of conclusion: Madeira

f) Improvement of port facilities to satisfy the new needs of nautical activities

Port facilities aimed at satisfying the new needs of nautical activities are required, especially in relation to large recreational boats and yachts. Port spaces should be reorganised, and facilities are being improved to satisfy local and international demand.

This is a medium-term action, which should be activated by regional authorities, and involve port authorities and private stakeholders.

Geographic scope of conclusion: Canary Islands

1.3.6.5 Blue biotechnologies

Non-legislative conclusions

a) Continuous cooperation in the Macaronesia region

Although this activity has a greater potential in ORs, significant cooperation could tackle challenges related to R&D, education and training and the exchange of best practices. Thus, continuous cooperation in the Macaronesia region is required. Strategies to address challenges regarding marine biotechnologies (funding, R&D, training, among others) should be defined at sea basin level. Currently, significant

work is being conducted by research and academia sectors within the context of the MAC programme.

This is a medium to long term action, which should be promoted by regional authorities and carried out by private stakeholders.

Geographic scope of conclusion: Sea basin level

b) Development of the productive infrastructure required to add value to microalgae production

There is the potential to produce blue biotechnological products that might enter competitive international markets e.g. pharmacy, food, cosmetics and other industrial uses. Development of a productive infrastructure is required to add value to microalgae production e.g. extraction of bioactive compounds. Investments have been undertaken in microalgae production, thanks in part to the former European Fisheries Fund. This has provided the basis for a future blue biotech activity. Investment needs have to be identified, and priorities established.

This is a medium-term action, which should be promoted by regional authorities and carried out by private stakeholders.

Geographic scope of conclusion: Canary Islands

Financial conclusions

a) Diversification of funding sources

Investments in equipment for commercial production are not eligible for EMFF aid, and require other forms of funding. *Sociedad para el Desarrollo de Canarias* (SODECAN) has created financial instruments based on ERDF for other innovative activities. This may serve as a model for biotechnological activity in general. Funding sources and mechanisms for carrying out these investments should be identified.

This is a medium-term action, which should be promoted by regional authorities and carried out by private stakeholders.

Geographic scope of conclusion: Canary Islands

1.3.6.6 Marine renewable energies

Non-legislative conclusions

a) Consolidation of cooperation and research in the area

Although this activity has a greater potential in ORs, significant cooperation could tackle challenges related to R&D, education and training and the exchange of best practices. Thus, continuous cooperation in the Macaronesia region is required. Strategies to address challenges regarding blue energies (funding, R&D, training, among others) need to be further developed.

This is a medium to long term action, which should be activated by regional authorities and involve private stakeholders and research institutes.

Geographic scope of conclusion: Sea basin level

2 Final remarks on all Outermost Regions

The blue economy in all ORs in all sea basins was seen to be concentrated in a few large activities, already almost fully developed, plus two ⁽¹¹²⁾ activities currently at a pre-development stage. Other activities have been identified in the different sea basins which have direct impacts on the environment and on the bio-resources. These activities are focused on the extraction of fossil fuels, marine aggregates and other minerals, and are based on extractive practices which are not in line with 'sustainable blue growth'.

In all ORs, **coastal tourism** plays a pivotal role: it is the blue activity with the largest socio-economic impact, since it employs the most number of persons and produces the highest GVA in the OR blue economy. The activity also had positive growth trends in almost all ORs and, considering their natural assets and the obvious spill-over effect that the development of this activity could have, coastal tourism can be considered as the activity having the biggest growth potential. On the other hand, while some ORs have a well-defined and structured supply of tourism services, allowing them to diversify strategies for reducing seasonality and increasing growth potential (e.g. the Canary Islands), others need to optimise available resources and improve the overall offer (e.g. Indian Ocean ORs). A common point observed in all sea basins is the fact that the development of this activity should not be a standalone process to be pursued in each OR, independently, based on the local context. The growth potential of this activity could be fulfilled by **developing synergies along the tourism supply chain and with other maritime activities of ORs**, and by adopting a common and **integrated development approach with other ORs** and countries in the same sea basin. For instance, the development of tourism in Canary Islands, also supported by the Promotional Strategic Plan ⁽¹¹³⁾, has followed an integrated approach, building synergies with other maritime and non-maritime activities within the OR (e.g. water and air transport, yachting, cruise, etc.) and cooperating with neighbouring territories (e.g. with Portuguese ORs and Cape Verde for cruise). The cooperation on cruises is being conducted through initiatives such as the Association Cruises in the Atlantic and more recently at government level ⁽¹¹⁴⁾.

Coastal tourism and its development in all ORs could be the driving force for the improvement of local economies ⁽¹¹⁵⁾, but at the same time it requires investments to increase the services provided and meet the growing demand for services. Increased flows of tourists will generate higher demand for goods to be consumed and, since all these territories are highly dependent on imports, the improvement of facilities serving **water freight transport** is essential for local economies. This means that deeper draughts should be made available in ports, or wider facilities for hosting bigger vessels should be developed, especially in French Guiana and Saint-Martin, and Indian Ocean ORs.

Higher tourist flows will also generate a higher demand for energy. This is the reason why **'new renewable energy'** is one of the most promising sectors in all ORs. Indeed, each territory is developing or testing its own facilities for producing green energy from available resources (e.g. ocean thermal energy, wave energy, offshore

⁽¹¹²⁾ 'Blue biotechnology' and 'Blue renewable energy' emerged as important activities to be developed, but are still at a pre-development stage.

⁽¹¹³⁾ http://www.turismodecanarias.com/promoturismocanarias/wp-content/uploads/2013/10/Plan_Estrategico_promocional_isla_canarias_2012-2016.pdf.

⁽¹¹⁴⁾ <http://www.laprovincia.es/las-palmas/2017/01/18/canarias-azores-madeira-cabo-verde/900611.html>.

⁽¹¹⁵⁾ Keeping the example of Canary Islands, 31.4 % of Gross Domestic Product of the OR is produced by tourism, employing 35 % of Canarian employed persons. Benefits in the local economy are evident not only within the sector itself, but also in other maritime and non-maritime activities. To this regard, it is worth mentioning that tourism creates 44.6 indirect jobs per 100 direct jobs.

facilities, etc.), and the possibility that tests will succeed and work in the future is very high, although at present technologies are expensive and still at a development stage.

Coastal tourism can also connect with other activities such as **fisheries and aquaculture**. Higher demand for food and (local) products means higher demand for fishery products, especially considering that fish is perceived by tourists as a typical component of the culinary tradition of almost all ORs. Therefore, seafood should be mainly used for meeting local demand, except for a few cases, such as Canary Islands, Azores, Madeira and French Guiana, where activity could be export-oriented, to some extent. The fulfilment of this potential is dependent on investments that need to be undertaken in all ORs, for different reasons (e.g. renewing fleets, landing infrastructures, resource management). In some cases, conflicts over the use of spaces could emerge, e.g. new aquaculture farms might have an impact on the landscapes and attractiveness of coastal areas, but the appropriate management of spaces could optimise the use of resources and mitigate possible conflicts.

Coastal tourism could also be an opportunity for fishermen to diversify their activity and increase their incomes. The development of practices such as pesca-tourism or the use of fishermen's vessels for recreational activities could significantly improve the economic conditions of local communities of all ORs, since the sea is a resource common to all these territories.

Cruise tourism constitutes another important maritime activity in almost all ORs, albeit at different levels. While for instance in Macaronesia cruise tourism has reached a high level of development (even if seasonality peaks should be spread over the year), other areas have registered a constant decline in cruise ships stopping off at their ports (e.g. Indian Ocean ORs), while others suffer the competition of other 'more renowned' tourist destinations (e.g. Caribbean ORs). The critical position of cruise tourism in some ORs does not however hinder the development of the sector, indeed it is an opportunity to generate further added value for local economies and improve local social conditions, creating new jobs. The adoption of a more strategic approach should be pursued, e.g. cooperating with neighbouring countries included in cruise circuits or directly cooperating with cruise companies. One of the main problems observed in many ORs are the very short stays of cruisers during stops. This problem is due to many reasons (lack of attractions, lack of services, etc.) which need to be tackled in order to extend the stays of cruisers and increase expenditure in the related ORs. To fill these gaps, the links between cruise terminal operations and shore-based activities (i.e. shore excursions or cruise port resorts) should be emphasised, potentially involving also cruise companies and other stakeholders to better meet the demand of cruisers and increase the attractiveness of services supplied. The creation of a permanent negotiation table with all stakeholders engaged in the activity could streamline the improvement of services on land.

Another activity identified in all ORs is '**blue biotechnology**', which is still at a pre-development stage but has a significant growth potential, due to the high availability of spaces for the production of algae useful for feeding industry. In general, only a few projects have started work on this activity and its potential is far from being fulfilled. However, the support of the public sector should be considered as being pivotal for the development of the activity, since it should facilitate FDI from private concerns, and should support the training of specialised personnel.

While coastal tourism could represent the 'leading engine' for the development of maritime activities in ORs, the analysis showed that each sea basin and **related territories presented their own specificities** and needs to be addressed, envisaging both public and private interventions to develop them. The table below reports main measures identified in each sea basin to be developed for each activity.

Table 9 – Summary table of main public and private interventions by sea basin

	Caribbean-Amazonia	South West Indian Ocean	Macaronesia
Fisheries and aquaculture	<ul style="list-style-type: none"> • Improve regional cooperation for the management of fishery resources. • Adopt guarantee systems and fiscal mechanisms for supporting investment in aquaculture. 	<ul style="list-style-type: none"> • Re-launch local aquaculture production by recruiting a local hatchery manager. • Align the remaining 'irregular' fishing vessels to EU safety standards. • Develop a longline tuna fishing fleet in Mayotte 	<ul style="list-style-type: none"> • Improve the control of irregular fishing activities. • Assess the sustainability of exploiting new species (deep-water species). • Support the diversification of fishing activities.
Coastal tourism	<ul style="list-style-type: none"> • Improve services in the marinas. • Upgrade hotels to international standards. • Support the development of ecotourism. • Develop synergies between cruise and coastal tourism. 	<ul style="list-style-type: none"> • Support the development of ecotourism. • Raise language skills of staff employed in the sector (English, French, Chinese and Russian). • Create a 'whale sanctuary' to enable whale watching in Réunion. 	<ul style="list-style-type: none"> • Ensure a trade-off between development activities and environmental protection. • Diversify activities in the Azores and Madeira. • Better plan and regulate the maritime space dedicated to tourism.
Cruise tourism	<ul style="list-style-type: none"> • Improve access to city centres and the waterfront. • Develop a regional cruise strategy shared by both private and public stakeholders. 	<ul style="list-style-type: none"> • Adopt an integrated approach for the development of cruise tourism at sea basin level. • Analyse and restructure the local cruise supply chain. 	<ul style="list-style-type: none"> • Reduce seasonality effects and coordination of efforts in the sector for increasing on-land offer to cruisers. • Develop short-haul, micro cruises in the Azores.
Shipping	<ul style="list-style-type: none"> • Improve cooperation between port administrations to reduce competition and increase complementarities. • Stimulate joint investments by port operators and private companies to enhance the ports' efficiency. 	<ul style="list-style-type: none"> • Develop short sea shipping in Mayotte. • Expand port infrastructures for transshipments and develop a free trade zone in Réunion. 	<ul style="list-style-type: none"> • Assess new port management models. • Improve environmental assessments of port infrastructures in Madeira. • Increase the number of connections to support tourist movements. • Develop the Azores as a transport and re-fuelling hub in the Atlantic.
Marine renewable energy	<ul style="list-style-type: none"> • Strengthen cooperation in the region to avoid duplication of research efforts. • Support a feasibility study in French Guiana for hydro-kinetic power. 	<ul style="list-style-type: none"> • Support the development of marine renewable energies in the sea basin. • Promote the development of adequate technologies given local weather conditions. • Support the training of the workforce in Réunion. 	<ul style="list-style-type: none"> • Consolidate cooperation and research in the area. • Supporting the exchange of best practices.
Blue biotechnology	<ul style="list-style-type: none"> • Support research and networking on the development of bio-resources. • Encourage the sharing of experiences between territories. 	<ul style="list-style-type: none"> • Support capacity building in the sea basin. • Launch research initiatives in blue biotechnology. 	<ul style="list-style-type: none"> • Develop the infrastructure required to add value to microalgae production. • Consolidate cooperation among territories in the basin.

Within the overall cooperation framework of the EU in the maritime sector, ORs can play a key role since they represent the presence of the EU in the world, acting as the 'outpost' for streamlining new fields of international cooperation. Within the **Transatlantic Ocean Research Alliance**, cooperation priorities identified by this Study concerned mainly the sustainable use of marine resources and management of fisheries. Caribbean and Macaronesia ORs could contribute to the external actions of EU within this cooperation framework, taking also into account the importance of fishery activities for ORs. Sustainable fisheries management is an important cooperation topic ⁽¹¹⁶⁾ within **Ocean governance**, and ORs in all sea basins could contribute to identify and promote new conservation and management measures at sea basin level. Furthermore, ORs can contribute to Ocean governance at sea basin level by proposing and applying actions in compliance with the EU maritime policies (such as the Common Fisheries Policy) or hosting regional offices for international purposes ⁽¹¹⁷⁾. ORs can therefore contribute to **disseminate best practices at sea basin level** and share experiences with neighbour countries. Moreover, within the wider frame of **European Neighbourhood Policy** ⁽¹¹⁸⁾, ORs concretely represent EU add-on for launching cooperation initiatives with developing countries. For instance, cooperation with Cape Verde within the MAC programme has been very fruitful in the field of water provision, development of nautical activities and tourism in general, and prospection and valorisation of new species for the fishing activity.

More in general, the role of the **public sector** in all activities was seen as the 'cornerstone' for the development of the blue economy, but not merely for providing financial support (for which private investments should be encouraged), but for developing a holistic organisation and vision of the entire maritime economy in each OR, working closely with neighbouring ORs or non-EU countries, especially for coastal and cruise tourism, which requires intense cooperation among territories in the same area.

On the other hand, it is worth noting that decision-making processes cannot be efficient without 'knowing the sector'. Indeed, while conducting this study, the **availability of data and information** was not uniform in different ORs, and in some territories data were not available at all. In some ORs detailed data and information were available for some economic activities (e.g. Canary Islands, Madeira, Azores), allowing a deeper analysis of some maritime activities and more of a chance to determine the steps to be taken. Furthermore, very few programmes, plans and strategies provided for the setting up of data collection systems in ORs for surveying and monitoring their blue economies.

Therefore, the first step to be taken is to set up robust and continuous data and information management systems for duly identifying the maritime dimension of all ORs and better defining strategies for developing their blue potential.

Two needs have been identified in the **fishery sector of all ORs**.

- Considering that EU policies do not cover fleet renewal, consultations between the private sector and national authorities could be launched to identify possible actions and funds, other than the EU funds, for renewing the fleet.
- Promotional campaigns should be launched for informing youngsters about the opportunities provided by the sector, training them as 'entrepreneurs' able to diversify their activity in other sectors (e.g. in coastal tourism). This task should contribute to improve the attractiveness of the activity for supporting generational turnover.

Apart from the overall lack of data and the specific issues related to data availability, another transversal gap identified in almost all ORs and in all maritime activities is the **limited**

⁽¹¹⁶⁾ <http://www.europarl.europa.eu/sides/getDoc.do?type=COMPARL&reference=PE-602.837&format=PDF&language=EN&secondRef=02>.

⁽¹¹⁷⁾ For instance, Réunion will host the offices of the Southern Indian Ocean Fisheries Agreement (SIOFA), the regional organisation in the Indian Ocean that will manage non-tuna fisheries resources exploited in the Indian Ocean.

⁽¹¹⁸⁾ https://ec.europa.eu/neighbourhood-enlargement/neighbourhood/overview_en.

availability of qualified and trained human resources. Furthermore, the absence of links between educational and training systems in ORs and industry (i.e. businesses involved in the blue economy) not only hinders the creation of qualified resources 'tailored' to meet industry needs, but also reduces the attractiveness of the maritime sector for younger generations, and limits generational turnover.

A more pro-active **role of industry in educational and training systems** should be envisaged in all ORs, and input from the sector should constantly be ensured, in order to maintain and indeed raise the competitiveness of each maritime activity. Structural funds are available for this purpose, and can support the raising of professional skills in OR blue economies, and increase the attractiveness of the sector in the eyes of younger generations.

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