3 Towards resilient, inclusive, sustainable and circular blue economies in cities and regions

Building on the assessment of benefits and costs of the blue economy at the subnational level (Chapter 1) and the multi-level governance and gap analyses of the blue economy (Chapter 2), this chapter sets out the framework for resilient, inclusive, sustainable and circular (RISC-proof) blue economies in cities and regions. It identifies the ways forward to bridge gaps towards RISC-proof blue economies, which relate to policy making, policy coherence and policy implementation.

A framework for resilient, inclusive, sustainable and circular (RISC-proof) blue economies in cities and regions

As part of a green and just transition, this chapter argues that cities and regions should foster blue economies that are:

- **Resilient** to economic and climate-related shocks and risks.
- **Inclusive** of local communities and stakeholders.
- **Sustainable** environmentally by limiting environmental impacts while protecting ecosystems and biodiversity.
- **Circular** by preventing waste (including plastics), fostering material efficiency and transforming waste into resources.

By enhancing adaptation to climate change impacts and mitigating the impacts of the blue economy on the climate and environment, a RISC-proof blue economy would contribute to climate adaptation and mitigation (Figure 3.1).

According to the self-assessment questions in the OECD Global Survey on Localising the Blue Economy (hereafter the OECD survey), where respondents were invited to express their level of agreement with a set of statements relating to the resilience, inclusiveness, sustainability and circularity of their blue economy (Table 3.1), respondents feel more advanced in sustainability and inclusiveness than in circularity and resilience (Figures Figure 3.2 and Figure 3.3). When it comes to sustainability, respondents show that limiting pollution from blue activities is a strong point but decarbonising blue economy sectors and protecting freshwater, coastal and marine ecosystems require further attention. Regarding inclusiveness, while respondents point to engaging local communities, more can be done to boost local employment in the blue economy and protect the most vulnerable from the consequences of water risks. Respondents convey that their blue economies are slightly more resilient to economic shocks and risks than climate-related ones. Finally, all three dimensions of circularity – preventing waste production, using resources efficiently and transforming waste into secondary materials – show lower rates of advancement compared to resilience, inclusiveness and sustainability. This chapter sheds further light on these results and provides concrete examples of what cities, regions and basins are already doing to foster a RISC-proof blue economy.

Table 3.1. Survey statements for assessing the resilience, inclusiveness, sustainability and circularity of the blue economy

Dimension	Statements
Resilient	The blue economy in my city/region is resilient to economic shocks and risks (e.g. economic crises, inflation)
	The blue economy in my city/region is resilient to extreme weather events exacerbated by climate change (e.g. floods, storms, cyclones, landslides or droughts, among others) through the use of tools such as disaster risk management, nature-based solutions, etc.
Inclusive	The blue economy in my city/region is inclusive by protecting the most vulnerable (e.g. those living in informal settlements or sub-standard housing) from water-related risks of "too much", "too little" or "too polluted water", and of disruption to freshwater systems.
	The blue economy in my city/region is inclusive and just by providing job opportunities.
	The blue economy in my city/region is inclusive by engaging with the local community and relevant stakeholders.
Sustainable	The blue economy in my city/region is sustainable by decarbonising blue economy activities (e.g. by shifting to renewable energy).
	The blue economy in my city/region is sustainable by limiting water, air and/or land pollution from economic activities.
	The blue economy in my city/region is sustainable by sustainably managing coastal, marine and freshwater resources (e.g. fish, minerals) and conserving freshwater, coastal and marine ecosystems (e.g. wetlands), including through the use of nature-based

Dimension	Statements
	solutions.
Circular	The blue economy in my city/region is circular, using resources efficiently and keeping them in use for as long as possible.
	The blue economy in my city/region is circular by preventing waste.
	The blue economy in my city/region is circular by transforming waste and/or by-products into resources.

Note: For each of these statements, survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", "neither agree nor disagree" or "not applicable".
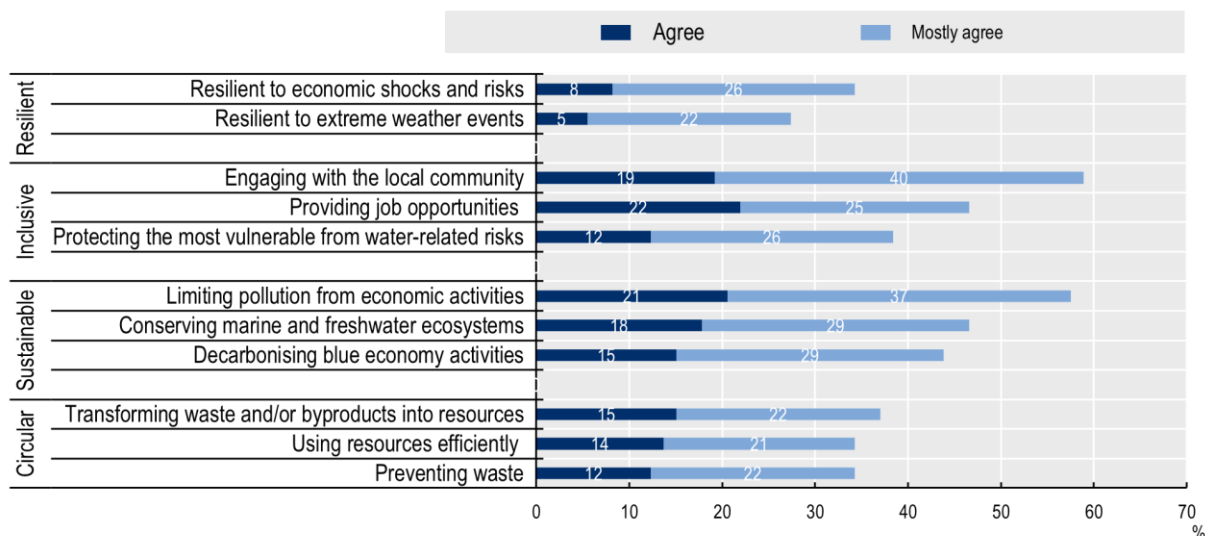Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Figure 3.1. Drivers, challenges and measures for RISC-proof blue economies in cities and regions
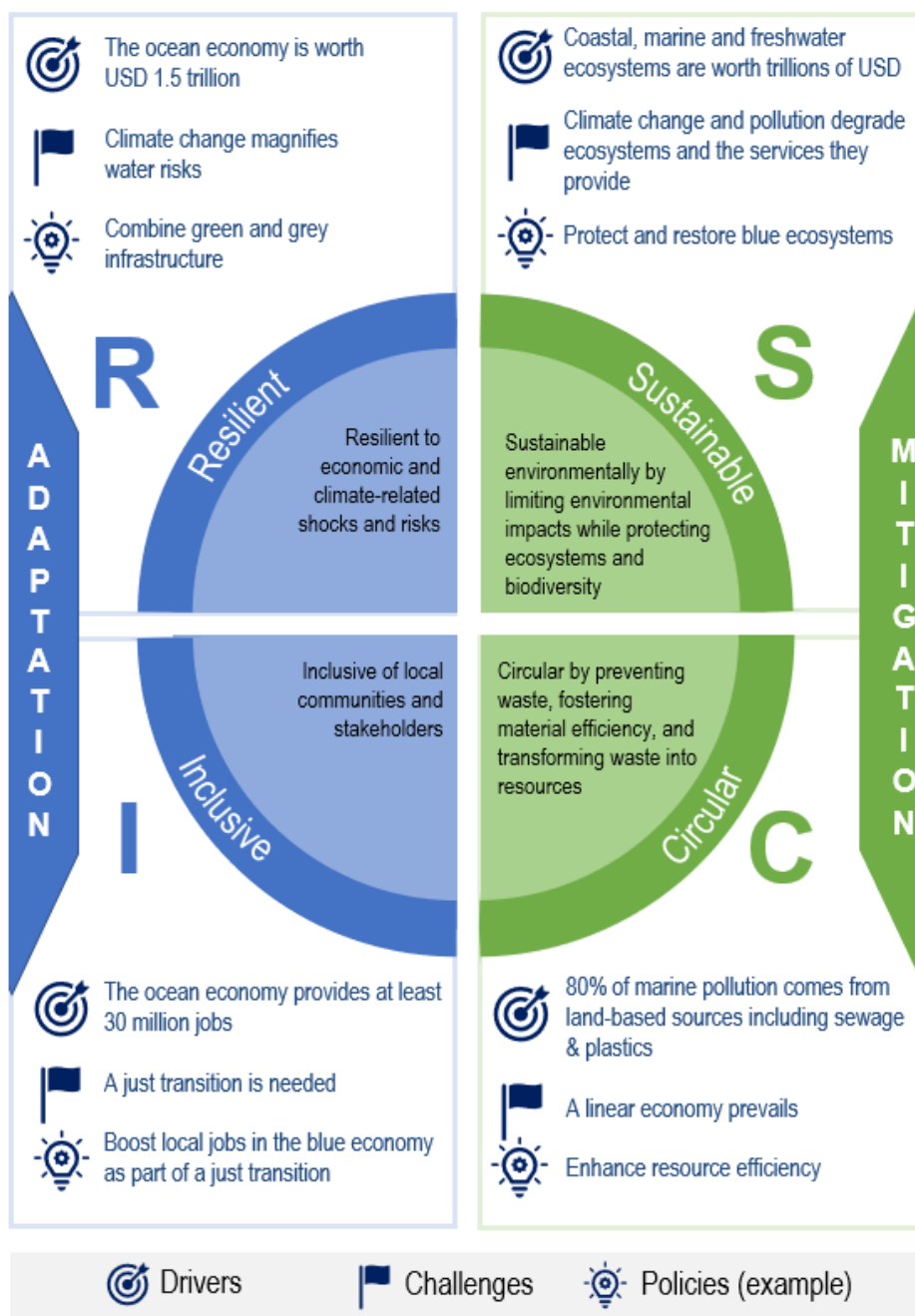
Figure 3.2. Self-assessment of the resilience, inclusiveness, sustainability and circularity of the blue economy

Note: Based on 73 responses to questions 2.1.1; 2.1.2; 2.1.3; and 2.1.4, further detailed in following sections. Survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", or "neither agree nor disagree" for each of the actions specified for the RISC dimensions.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Figure 3.3. Self-assessment of the resilience, inclusiveness, sustainability and circularity of the blue economy (averages)
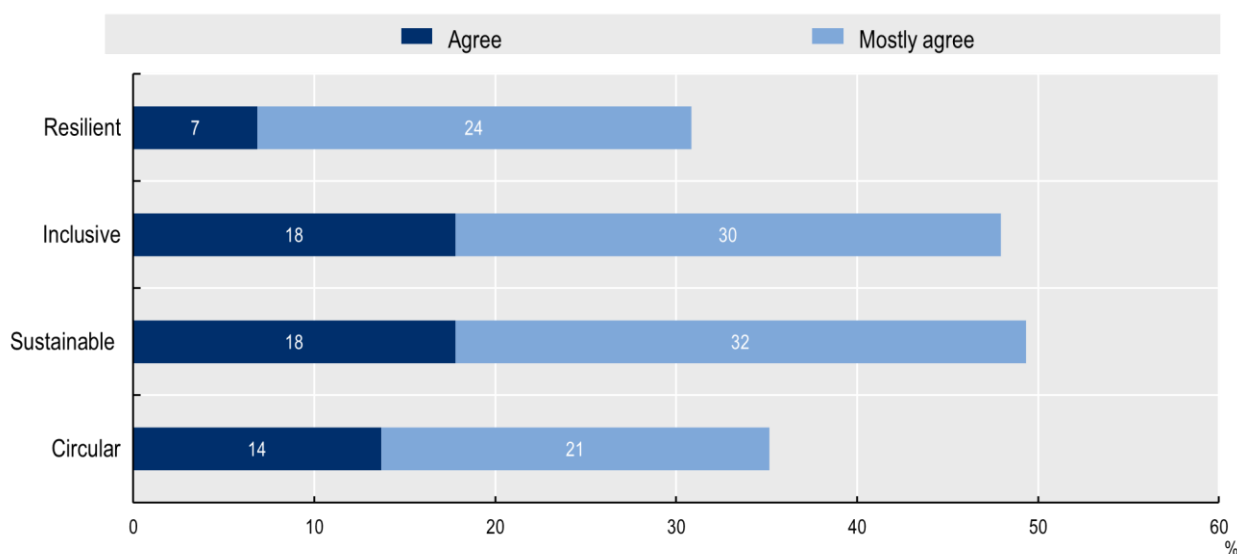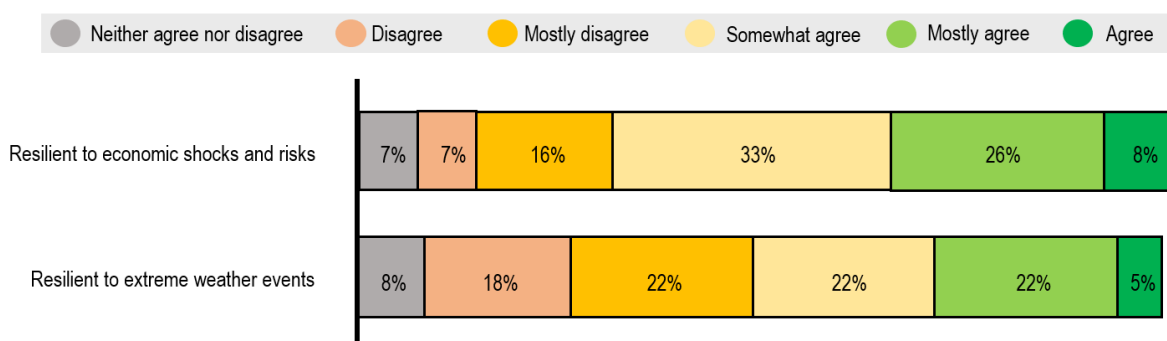

Note: Based on 73 responses to questions 2.1.1; 2.1.2; 2.1.3; and 2.1.4 further detailed in following sections. The average was calculated for each RISC dimension based on the responses selected to "agree" or "mostly agree" for the respective actions.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Resilience

Resilience reflects the ability of blue economies to prepare, absorb and recover from a range of shocks, risks or threats, in particular economic shocks and risks (e.g. economic crises, inflation) and extreme weather events (e.g. floods, storms or droughts) exacerbated by climate change, which particularly affect water-dependent blue economies. In total, 34% of respondents to the OECD survey agree or mostly agree that their blue economies are resilient to economic shocks and risks that can arise from demographic, social, financial, political, geopolitical or health-related threats (Figure 3.4). For example, government-imposed lockdowns to curb the spread of the COVID-19 pandemic in 2020 led to a sharp decline in the trade of goods (OECD, 2022[2]), significantly affecting shipping, which accounts for around 90% of traded goods. To support recovery from the COVID-19 pandemic, the European Union (EU) Recovery and Resilience Facility deployed EUR 724 billion in loans and grants to support the reform and investment packages put forward by member states in their national Recovery and Resilience Plans (RRPs), which foresee investments in blue economy sectors (Box 3.1).

Figure 3.4. Self-assessment of the resilience of the blue economy

Note: Based on 73 responses to question: "2.1.1. To what extent is the blue economy in your city/region resilient?". Survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", "neither agree nor disagree" or "not applicable" for each of the following statements: "The blue economy in my city/region is resilient to economic shocks and risks (e.g. economic crises, inflation)" and "The blue economy in my city/region is resilient to extreme weather events exacerbated by climate change (e.g. floods, storms, cyclones, landslides or droughts, among others) through the use of tools such as disaster risk management, nature-based solutions, etc". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Box 3.1. The blue economy as part of EU member states' Recovery and Resilience Plans

As part of its national Recovery and Resilience Plan (RRP) France Recovery (*France Relance*) (2021), France invested EUR 650 million in the maritime sectors of the blue economy, with the aim of supporting and developing blue economy sectors (such as fishing, aquaculture, ports and maritime industries, tourism and research), to strengthen coastline resilience and preservation, to promote seafaring professions and to disseminate maritime culture. The mobilisation of funds is tangible at the local level, mainly in coastal cities, through contracts between the central government and coastal regions and municipalities. Examples of measures at the local level include the decarbonisation of maritime transport and adaptation to sea level rise and coastal erosion.

Several dimensions of the blue economy are included in the RRP of Spain, Spain Can (*España Puede*) (2021). One of the objectives of the urban and rural agenda is to transform and digitalise the fisheries and agri-food supply chain to promote quality, sustainability and the circular economy, ecological production and seasonal and local consumption, the reduction of food waste, and value and job creation with a focus on rural areas. Tourism is seen as a strategic sector requiring digitalisation, modernisation and competitiveness to become sustainable and resilient. Regarding energy, the RRP features a roadmap for offshore wind energy and related support programmes for the development of new renewable energy technologies in the marine field. Finally, the plan seeks to conserve and restore marine and terrestrial ecosystems by mobilising investments in green infrastructure and preserving the coast and water resources through investments to reduce the vulnerability of coastal areas and water resources facing the effects of climate change. It includes actions to boost integrated water management, focusing on nature-based solutions (NbS) for water purification, sanitation and reuse, optimisation of water infrastructure, river restoration and aquifer recovery.

The RRP of Portugal, Recovering Portugal, Building the Future (*Recuperar Portugal, Construindo o Futuro*) (2021) focuses on resilience, climate and digitalisation, with EUR 252 million for the blue economy across 4 key investments. These include the creation of a Blue Hub as a "network of infrastructures for the blue economy" to incubate and promote companies in the blue bioeconomy and other emerging sectors (EUR 87 million) and the Azores Blue Economy Cluster to foster research and development in traditional and emerging sectors (32 million). The Green and Digital Transition and Security in Fisheries programme strives to reduce greenhouse gas (GHG) emissions from maritime economy activities by 2030 by fostering energy efficiency, modernisation, marine waste management and circularity of companies and organisations in the fisheries sector (EUR 21 million). The Atlantic Defence Operations Centre and Naval Platform contributes to ecosystem preservation and ocean health while protecting the value chains of various ocean sectors from pollution and illegal activities by implementing emergency operations, surveillance, scientific and technological research, as well as environmental and meteorological monitoring (EUR 112 million).

Source: EC (2022[3]), *Recovery and Resilience Plans*, https://reform-support.ec.europa.eu/what-we-do/recovery-and-resilience-plans_en; Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique (2021[4]), *Plan de relance*, https://www.economie.gouv.fr/plan-de-relance#; Government of Spain (2021[5]), *España Puede*, https://dipucordoba.es/wp-content/uploads/2020/12/PNRTR-ESPANA-PUEDE.pdf; Government of Portugal (2021[6]), *Plano para a Recuperação e a Resiliência: Recuperar Portugal, Construindo o future*, https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=%3d%3dBQAAAB%2bLCAAAAAAABAAzNDQzNgYA62SpeQUAAAA%3d; and inputs from the 31st meeting of the OECD Working Party on Urban Policies (9 May 2022).

Relative to other dimensions, the resilience of subnational blue economies to extreme weather events fares poorly, with 27% of respondents agreeing or mostly agreeing with the statement. Nevertheless, some cities and regions report combining infrastructure and governance measures to enhance the climate resilience[1] of their blue economies. For instance, in the region of Basque Country, Spain, the Urban Klima climate action project foresees adaptation measures and NbS in coastal areas, ports and river basins to enhance the resilience of urban and natural coastal areas as well as resilience to extreme weather. The city of Sète in France has implemented NbS (e.g. beach nourishment operations and sand-filled geotextile bags to mitigate wave impacts) to strengthen beach and dune systems and tackle erosion on the barrier beach from Sète to Marseillan. Combined with grey infrastructure, NbS[2] can reduce adaptation costs while contributing to flood control and coastal protection (IPCC, 2022[7]). National governments can provide the framework and the enabling conditions for the deployment of NbS at the local level, including funding (Box 3.2).

> **Box 3.2. The role of national and subnational governments in fostering the uptake of nature-based solutions for climate resilience**
>
> OECD work on scaling up NbS to tackle water-related climate risks finds that key national policy documents, such as national adaptation plans or biodiversity strategies, often promote NbS as a means to address climate risks. In some cases, NbS feature as both mitigation and adaptation measures in nationally determined contributions to the Paris Agreement on climate. Although among the 35 OECD member countries with national adaptation plans, the majority mention the importance of NbS in addressing water-related climate risks, few include concrete implementation measures (e.g. monitoring systems), and none have defined quantitative targets for NbS implementation. At the national level, the OECD suggests:
>
> - Integrating targets and actions for NbS into overarching national policies (e.g. on climate mitigation and adaptation) as well as sectoral ones (e.g. agriculture, infrastructure, disaster risk management, tourism, water, housing, etc.).
> - Promoting and co-ordinating NbS across a wide range of actors, such as national flood and drought management agencies, public works or infrastructure agencies, infrastructure operators, regional and local authorities, as well as non-government players.
> - Reforming regulations such as land use planning, building codes and public procurement to unlock the potential of NbS.
> - Collecting and sharing data and information on good practices and performance of NbS.
> - Overcoming fragmentation in the funding landscape for NbS.
> - OECD work on implementing NbS at the subnational level highlights four common challenges and recommendations for municipal governments:
> - Examining project selection and public procurement criteria to better capture the indirect benefits of NbS over the project lifecycle.
> - Strengthening spatial planning frameworks to take an integrated approach to land, water and soil management.
> - Exploring options to broaden the funding base to ensure sufficient resources for infrastructure maintenance, potentially including taxes on negative externalities and revised service charges.
> - Building capacity for NbS through integration in professional education, peer learning between municipalities and creation of a platform for sharing data and good practices.
>
> Source: OECD (2021[8]), *Scaling up Nature-based Solutions to Tackle Water-related Climate Risks: Insights from Mexico and the United Kingdom*, https://doi.org/10.1787/736638c8-en; OECD (2023[9]), "Promoting nature-based solutions in municipalities in Hungary", https://doi.org/10.1787/d81fb09f-en.

Inclusiveness

In the framework of the RISC-proof approach to the blue economy, inclusiveness refers to the ability of cities and regions to: i) engage local communities and relevant stakeholders in the blue economy; ii) boost job creation and consider the distributional impacts of green policies in the blue economy as part of the just transition; and iii) protect local communities, especially vulnerable groups, from climate and water-related risks. Analysis of blue economy strategies and international declarations points to inclusiveness as the weakest dimension, lagging behind economic and environmental ones (Bennett et al., 2022[10]). Some recent (e.g. Norway and Scotland, United Kingdom) and upcoming (e.g. Canada) national blue economy strategies highlight the importance of equity, gender considerations or involving Indigenous peoples but

further action is needed to implement these principles (e.g. diversity requirements for hiring, capacity building and social impact assessments). Examples of how cities and regions are making their blue economies more inclusive are given below.

Figure 3.5. Self-assessment of inclusiveness of the blue economy
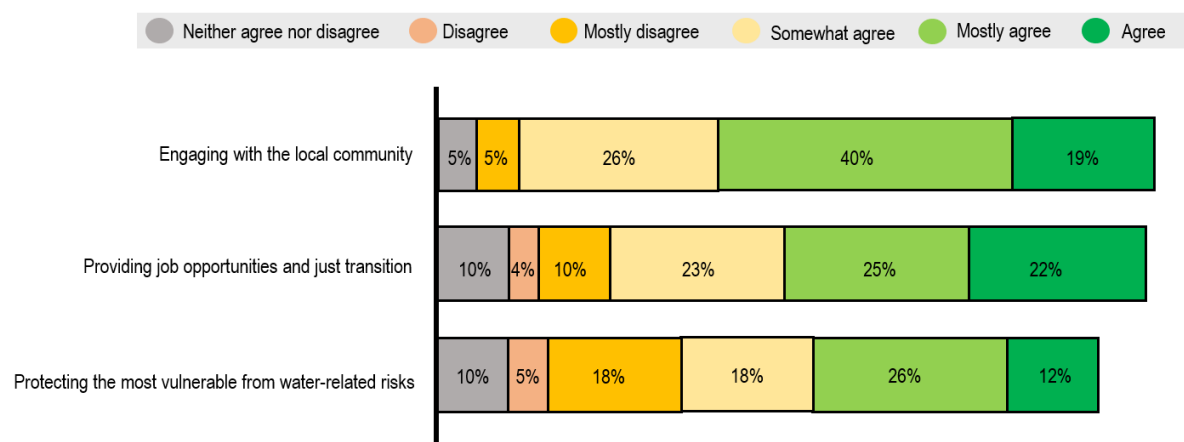
Note: Based on 73 responses to the question: "2.1.2. To what extent is the blue economy in your city/region inclusive?". Survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", "neither agree nor disagree" or "not applicable" for each of the following statements: "The blue economy in my city/region is inclusive by protecting the most vulnerable (e.g. those living in informal settlements or sub-standard housing) from water-related risks of "too much", "too little" or "too polluted water", and of disruption to freshwater systems", "The blue economy in my city/region is inclusive by providing job opportunities and ensuring a just transition" and "The blue economy in my city/region is inclusive by engaging with the local community and stakeholders". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

More than half (59%) of respondents report involving local communities and stakeholders in blue economy activities (Figure 3.5). For example, the county government of Kisii, Kenya, invites local communities from all nine sub-counties to make proposals on blue economy programmes and projects as part of the development of the County Integrated Development Plan. In the state of Rio Grande do Sul, Brazil, the Port Authority (Portos RS) and the Federal University of Rio Grande developed a strategic socio-environmental project through dialogue with stakeholders, generating scenarios to be considered within future plans for the port and waterway operations, and eventually leading to the establishment of guidelines for the port. The level and channel of engagement depend on objectives, which should be specified upfront, and stakeholder engagement mechanisms should avoid consultation capture from over-represented groups (OECD, 2015[11]). For instance, coastal property owners typically have a stake in influencing coastal decision making and can potentially block measures that reduce the value of their property, while vulnerable groups are often less engaged in decision-making processes.

Some cities and regions pay particular attention to involving disadvantaged groups. In the Glasgow City Region, Scotland, United Kingdom, the Climate Ready Clyde cross-sectoral initiative[3] for climate adaptation recognises coastal adaptation as a question of social justice and fosters participative and inclusive decision making by integrating and mobilising stakeholders, including the most vulnerable, such as young and elderly populations (Ocean & Climate Platform, 2022[12]). The region of Los Lagos, Chile, compensates Indigenous communities in designated coastal areas administrated by Indigenous peoples (*Espacios Costeros Marinos Pueblos Originarios*, ECMPO) for conserving and making sustainable use of blue carbon ecosystems (e.g. algae), thereby contributing to the country's nationally determined contribution and the region's carbon neutrality objective.

Almost half (47%) of survey respondents agree or mostly agree that the blue economy provides job opportunities as part of a just transition (Figure 3.5). For example, the city of Barcelona, Spain, studied new occupations in the blue economy, analysing opportunities for the creation of quality employment and the corresponding upskilling and reskilling needs of workers. In the Philippines, the Council for Agriculture, Aquatic and Natural Resources Research and Development together with the local government unit of Los Baños launched a programme focused on enhancing gender-sensitive, science and technology-based livelihood enterprises in organic vegetable and tilapia fish production through capacity development. The blue economy should be just by ensuring that existing practices in blue economy sectors do not adversely impact small-scale businesses and local communities. For instance, in many countries, industrial and foreign fleets have overfished resources, undermining the livelihoods of small-scale fishers (OHCHR, 2022[13]). The maritime strategy of the Catalonia region in Spain prioritises inclusive collaboration to develop community-led fishing management structures based on co-management. Each stakeholder interested in achieving sustainable fishing with an ecosystem approach can participate with equal decision-making power and take on shared responsibilities in the co-management process.

Finally, around one-third (38%) of respondents agree or mostly agree that the most vulnerable local communities are adequately protected from water-related risks. For instance, the resilience strategy of the city of Salvador, Brazil, includes a plan to develop two parks around recovered riverbanks, one of which runs through the low-income peri-urban area of Suburbio Ferroviário, enhancing flood resilience while providing riverside recreational equipment for children and sports equipment for adults. River basin organisations also engage stakeholders to address water scarcity and flooding issues: for example, the Seine-Normandie Water Agency in France organised Water Stakeholder Fora in 2022 to discuss the implementation of the Water Development and Management Plan (*Schéma directeur d'aménagement et de gestion des eaux*, SDAGE) for 2022-2027 with close to 900 local stakeholders.

Sustainability

Within the RISC-proof approach, sustainability refers to the ability of cities and regions to limit the adverse environmental impacts of the blue economy while protecting blue ecosystems and biodiversity. The results of the OECD survey suggest that respondents have a relatively positive perception of their efforts to limit pollution from blue economic activities but that more efforts are required to conserve freshwater and marine ecosystems and decarbonise blue economic activities (Figure 3.6). Examples from cities and regions taking action on each of these three dimensions – decarbonisation, pollution limitation and ecosystem conservation – are provided below.

More than half of respondents (58%) agree or mostly agree that their blue economies make efforts to limit water, air and land pollution. For instance, the zero-emission multiservice port energy barge in the Port of Sète, France, provides energy to all ships in the port through a "green" hydrogen fuel cell, eliminating the emission of harmful air pollutants close to human settlements onshore.

In many cases, measures taken to decarbonise the blue economy have co-benefits for pollution, with 44% of respondents agreeing or mostly agreeing that their blue economies take action to reduce GHG emissions. For example, the Spanish city of San Sebastian is purchasing new boats for public transport and tourism routes with photovoltaic panels and electric motors, simultaneously reducing GHG emissions, air and noise pollution. The city of New Orleans and state of Louisiana, United States, both have Climate Action Plans to reduce GHG emissions to net zero by 2050. Water-based renewable energy (e.g. hydropower, offshore wind power and tidal energy in oceans, deltas and rivers) has great potential for reducing GHG emissions from energy use. For instance, the electricity supply of Seattle, United States, is largely based on hydropower, and the Port of Seattle is decarbonising its activities by using cleaner energy sources, among other measures. The survey highlights that ports are often important actors in innovative projects to limit pollution and GHG emissions within the blue economy (Box 3.3).

Figure 3.6. Self-assessment of sustainability of the blue economy
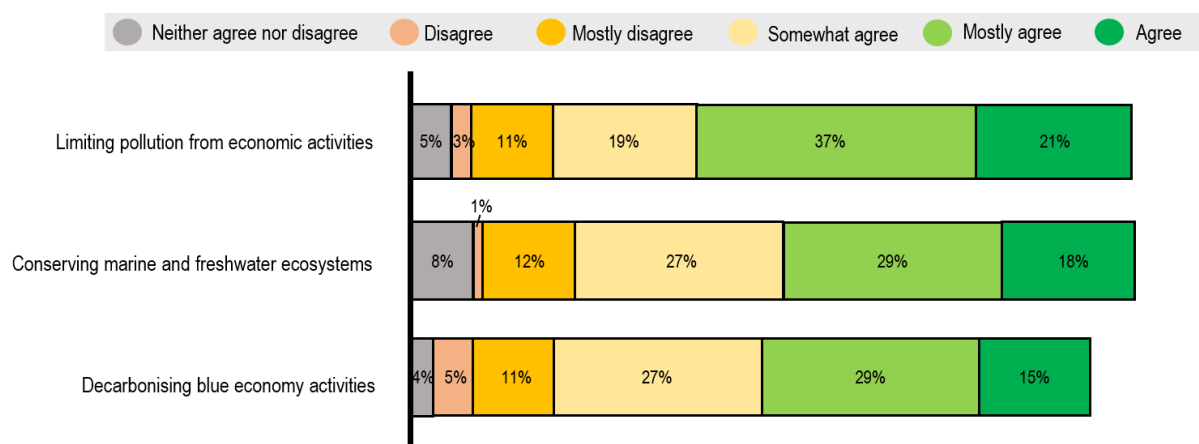
Note: Based on 73 responses to the question: "2.1.3. To what extent is the blue economy in your city/region sustainable?". Survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", "neither agree nor disagree" or "not applicable" for each of the following statements: "The blue economy in my city/region is sustainable by decarbonising blue economy activities (e.g. by switching to renewable energy)", "The blue economy in my city/region is sustainable by limiting water, air and/or land pollution from economic activities" and "The blue economy in my city/region is sustainable by sustainably managing coastal, marine and freshwater resources (e.g. fish, minerals) and conserving ecosystems (e.g. wetlands), including through the use of nature-based solutions". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Box 3.3. Port-led initiatives to foster sustainability in the blue economy

Ports are key elements in global supply chains. Connecting water and land, their strategic locations on coasts or rivers place them on the spearhead of climate change impacts as well as the development of solutions. Their role as connectors can help them multiply action for sustainable development, particularly in the energy transition. Furthermore, ports are often at the interface of different ecosystems and port authorities are responsible for the sustainable management of vast territories of more than 10 000 hectares, making port authorities strategic actors for biodiversity protection.

The OECD survey reveals that port authorities often lead or take part in innovative initiatives to reduce environmental degradation from the blue economy or restore blue ecosystems surrounding ports. For example, the Port of Seattle is using NbS to restore blue ecosystems and capture carbon emissions from its operations, for example by mapping kelp forests with the Seattle Aquarium and through the Smith Cove Blue Carbon Pilot Project, which traps carbon with aquaculture and vegetation. As part of a consortium of four partners, the Port of Vigo in Spain is hosting the Living Ports project, which aims to shift away from grey infrastructure in ports, including through seawalls with innovative concrete that fosters the regeneration of local marine biodiversity. Through its 15-year environmental plan Cáyoli started in 2016, the French Port of Guadeloupe aims to protect and restore the mangroves, coral reefs and seagrass ecosystems present in the port, including through the development of mangrove and coral nurseries, the restoration of nesting areas for different species, and awareness-raising campaigns with local students.

The ports of Antwerp in Belgium, Rotterdam in the Netherlands and Seattle, amongst others, have clean energy initiatives underway. The Port of Antwerp, which aims to become climate-neutral by 2050, has launched the world's first tugboat powered by combustion engines that burn hydrogen in combination with traditional fuel. As part of its ambition to become a hydrogen hub by 2050, the Port of Rotterdam

has implemented a range of projects to produce climate-neutral (i.e. "blue and green") hydrogen in the port, import hydrogen and becoming a central platform in the new hydrogen market, support new bunker stations for hydrogen-based fuels for inland vessels, trucks and aviation and support the energy transition of the industries associated to the port. The Port of Seattle is working with partners to assess the viability of a "green corridor" to expedite the use of zero GHG emission ships and operations connecting the Canadian and United States regions of Alaska, British Columbia and Washington, primarily focusing on cruise ships.

Source: External contribution from the International Association of Cities and Ports (AIVP); OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.
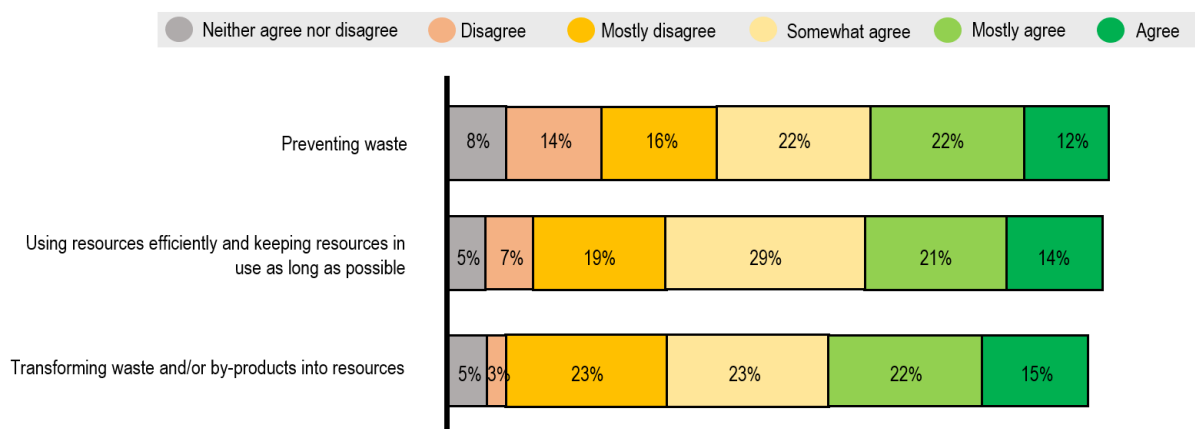
A total of 47% of survey respondents report managing coastal, marine and freshwater resources in a sustainable way and taking action to conserve blue ecosystems, e.g. through planning, stakeholder engagement and NbS. Sustainable land use planning rules can help limit the impact of waterfront economic development on freshwater and marine ecosystems. For instance, the Netherlands' Environment and Planning Act, which entered into force in January 2024, will integrate, modernise, harmonise and simplify current rules related to land use planning, environmental protection, nature conservation, construction of buildings, protection of cultural heritage, water management, urban and rural redevelopment, development of major public and private works and mining and earth removal into a single legal framework (Government of Netherlands, 2023[14]). The city of Sète, France, interacts with the union formed around the Thau Basin, which was created in 2005 to preserve the Thau Lagoon and its fishing and marine culture activities. Part of its activities aims to co-ordinate and evaluate local policies to ensure the protection of water, species and natural areas. The Infrastructure Investment Authority in the state of Pennsylvania, United States, supports the Partnership for the Delaware Estuary in building a mussel hatchery to improve water quality in the estuary, collect new data and raise awareness on mussels as an NbS to improve water quality.

Subnational and national governments have also carried out freshwater rehabilitation projects with positive implications for the blue economy. For example, the capital city of Manila, Philippines, is a coastal and fluvial city with the Pasig River at its centre, a major transport route for passengers and goods. Following decades of pressure from unregulated river use and human activity, national authorities are leading a rehabilitation project. The Metropolitan Manila Development Authority, the Pasig River Rehabilitation Commission and the Greater Paris Sanitation Authority have set out an action plan. Through wastewater treatment and solid waste collection, the rehabilitation project has led to the decrease of various pollutants, including heavy metals (mercury, arsenic, etc.) in one branch of the river and an overall increase in water quality. Improved water quality and access to the riverbanks have, in turn, allowed a revival of fish farming activities as well as recreational activities for inhabitants of Manila.

Circularity

Within the RISC-proof approach, circularity refers to the ability of cities and regions to prevent waste, to use resources efficiently and keep them in use for as long as possible and to transform waste and/or byproducts into resources. By doing so, the circular economy can reduce waste and create new materials and goods that reduce the need for resource extraction, production and associated pollution. Additionally, the shift to a circular economy is needed to help tackle the 45% of GHG emissions associated with the production, use and disposal of products, as improving energy efficiency and switching to renewables will only address 55% of current emissions (Ellen MacArthur Foundation, 2022[15]). Responses to the OECD survey reveal that around one-third of respondents are starting to apply circular economy principles to the blue economy (Figure 3.7).

Figure 3.7. Self-assessment of circularity of the blue economy

Legend: Neither agree nor disagree | Disagree | Mostly disagree | Somewhat agree | Mostly agree | Agree

Preventing waste: 8% | 14% | 16% | 22% | 22% | 12%

Using resources efficiently and keeping resources in use as long as possible: 5% | 7% | 19% | 29% | 21% | 14%

Transforming waste and/or by-products into resources: 5% | 3% | 23% | 23% | 22% | 15%

Note: Based on 73 responses to the question "2.1.4. To what extent is the blue economy in your city/region circular?". Survey respondents were invited to select one of the following options: "agree", "mostly agree", "somewhat agree", "mostly disagree", "disagree", "neither agree nor disagree" or "not applicable" for each of the following statements: "The blue economy in my city/region is circular by using resources efficiently and keeping resources in use for as long as possible", "The blue economy in my city/region is circular by preventing waste" and "The blue economy in my city/region is circular by transforming waste and/or byproducts into resources". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2023[1]), "OECD Global Survey on Localising the Blue Economy (July 2022- September 2023)", Unpublished, OECD, Paris.

Around one-third (35%) of respondents agree that their blue economy uses resources efficiently and keeps them in use for as long as possible. Several opportunities for efficient resource use within the blue economy exist, especially regarding port, shipbuilding and repair activities. For example, the nautical and naval industries in the cities of Puerto Montt, Chile, and Nouadhibou, Mauritania, and the regions of Nouvelle-Aquitaine, France, and the state of Washington, United States, carry out repair activities in order to maintain existing commercial and recreational vessels.

A similar share (34%) of respondents agree that they prevent waste production within the blue economy. For example, the city of Seattle engages in a number of plastic pollution prevention efforts (e.g. the U.S. Plastics Pact) and passed some of the first local ordinances in the country banning foam food service ware and single-use plastic bags. It was the first major United States city to ban plastic straws. The city of Rotterdam, the Netherlands, has launched BlueCity, a platform and accelerator for circular entrepreneurs that contribute to reducing waste and pollution by reusing existing products and materials.

Finally, 37% of respondents agree that their blue economies support the transformation of waste and/or byproducts into resources. Numerous applications are possible within the blue economy: waste from seafood processing can be recovered to produce new materials (e.g. packaging materials), and food waste from waterfront tourism accommodation can be redistributed or recycled. For example, the city of Rotterdam, the Netherlands, aims to have a fully circular and climate-resilient water system by 2050, building on current projects that reuse wastewater and recover phosphate, cellulose, bioplastic and energy from wastewater. Depending on national legislative developments, these materials could potentially be sold to local farms as fertilisers. Panama City, Panama, converts plastics recovered from beach and river cleaning into raw materials for the production of urban furniture installed in municipal parks. In the county of Kisii in Kenya, aquaculture effluents rich in nutrients are reused to irrigate kitchen gardens across the county; in Gijón, Spain, oyster waste is being analysed for subsequent use as fertiliser. The city of Salvador, Brazil, supports innovative businesses such as Gbcycle, a start-up using a biorefinery with a microalgae-based process to eliminate and transform pollutants into high-added-value biomass and bioproducts, preventing waste and pollutants from entering the city's coast and ocean.

The enabling conditions for RISC-proof blue economies in cities and regions

Reaching a RISC-proof blue economy requires certain enabling conditions related to governance to be in place. Drawing from the OECD Multi-level Governance Framework "Mind the Gaps, Bridge the Gaps" (Charbit and Michalun, 2009[16]), the OECD Principles on Water Governance (OECD, 2015[17]) and the OECD Scoreboard on the Governance of the Circular Economy (OECD, 2020[18]), the following sections set out recommendations for nine ways forward for a RISC-proof blue economy, clustered in three groups: policy making, policy coherence and policy implementation (Figure 3.8). Policy making relates to establishing clear roles and responsibilities, holding the right institutional capacities and basing decisions on data and information. Policy coherence refers to the alignment of mandates, policies and sectoral objectives across government institutions. Finally, policy implementation is about the tools used to operationalise policies, including financing, regulation and facilitating synergies within an ecosystem of local blue economy actors. These recommendations are based on the New York City Multi-Stakeholder Pledge on Localising the Blue Economy, presented by the OECD and partners at the United Nations (UN) 2023 Water Conference in New York City, United States (Box 3.4).

Figure 3.8. The enabling conditions for RISC-proof blue economies in cities and regions
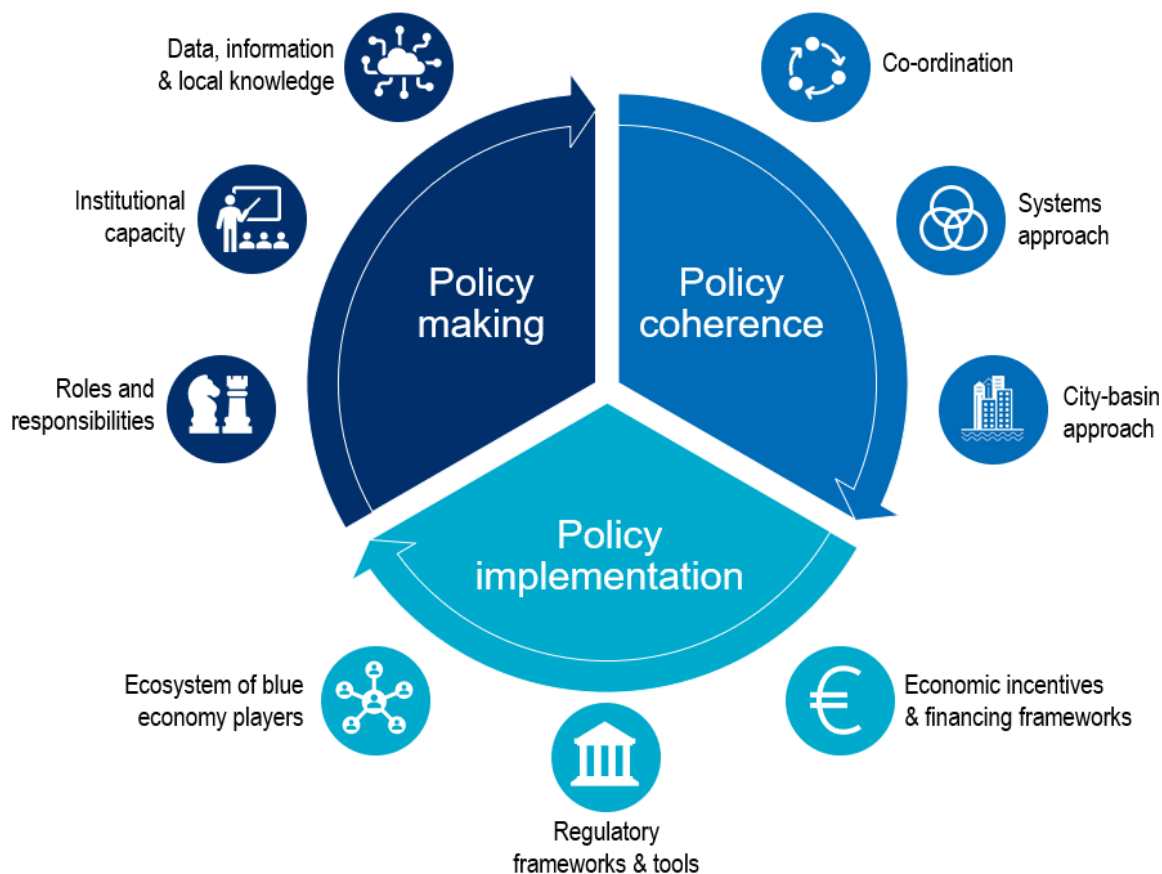
Source: Adapted from OECD (2020[18]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

Box 3.4. The New York City Multi-Stakeholder Pledge on Localising the Blue Economy

The Multi-stakeholder Pledge on Localising the Blue Economy was co-developed by the OECD and survey partners, including the International Association of Cities and Ports (AIVP), Atlantic Cities, ICLEI – Local Governments for Sustainability Southeast Asia Secretariat, the International Network of Basin Organizations, the Ocean & Climate Platform, the Resilient Cities Network and United Cities and Local Governments Africa. It sets out ten commitments for the partners to foster a territorial approach to the blue economy. The pledge was launched at the UN 2023 Water Conference side event "Localising the blue economy: A city-basin approach" held on 24 March 2023 at the United Nations in New York City. The partners commit to:

1. Acknowledge the role of cities, regions and basins in fostering RISC-proof blue economies that are: *resilient* to economic and water-related shocks and risks exacerbated by climate change; *inclusive* of local communities and stakeholders, especially the most vulnerable; *sustainable environmentally*, to maximise economic benefits while limiting GHG emissions, pollution, ecosystem degradation and biodiversity loss; and *circular*, to limit resource extraction and tackle associated waste and pollution, including from plastics.

2. Promote a "city-basin" approach to water resources management beyond administrative boundaries and across relevant institutions, from source to sea, to tackle water risks and pollution and unlock the potential of the blue economy through stakeholder engagement, planning, co-ordination, data collection and monitoring.

3. Encourage greater co-ordination across local and national government departments in charge of oceans, freshwater and aquifers for coherent responses to current and emerging environmental, economic and social challenges magnified by climate change, population, economic growth and unsustainable land use practices.

4. Nurture a systems approach to the blue economy, involving all blue economy sectors and players, such as seafood, tourism, transport, port activities and water-based renewable energy, to make the most of synergies across water, climate mitigation, climate adaptation, waste, industrial policy and land use planning, among others.

5. Call on national and subnational governments to set sound incentives and frameworks to catalyse investments needed for sustainable blue economies at the local level to avoid and reduce waste generation, GHG emissions, water and land contamination, depletion of natural resources and biodiversity loss.

6. Encourage meaningful engagement of local communities in knowledge-sharing and bottom-up learning, striving to ensure equal access to marine resources and freshwater sources, acknowledging local specificities, histories and heritage and fostering inclusiveness and gender equality of traditional and emerging blue economy sectors.

7. Explore the opportunities of a sustainable blue economy for job creation, innovation and environmental protection, particularly through emerging sectors (e.g. blue bioeconomy, biotechnology), while ensuring a just transition.

8. Support the collection, analysis and disclosure of granular socio-economic and environmental data that can be used to inform blue economy decision making.

9. Promote capacity development and ocean literacy, and ensure that educational programmes, especially for youth, are tailored to local sustainable blue economy needs.

10. Strive to support governments at all levels to foster RISC-proof blue economies by providing guidance, sharing international best practices and providing new data and measurement tools.

Policy making

Clarify roles and responsibilities for blue economy policy

Cities and regions should clarify roles and responsibilities for RISC-proof blue economy policy across departments and agencies in terms of policy making, implementation and operational management. In addition, governments should ensure regular communication and co-ordination across levels of government to avoid gaps, overlaps and inefficiencies. As part of a territorial approach, national governments should acknowledge the role of cities and regions in blue economies and local specificities, contexts and heritage in the design of policies affecting subnational governments.

Match the level of institutional capacity to blue economy policy needs

Governments should match the level of institutional capacity to RISC-proof blue economy policy needs to ensure effective policy making, policy implementation and operational management. To strengthen government capacity, national and subnational authorities can promote the education and training of civil servants, provide them with technical support and guidelines, and implement policies to attract and retain talent with merit-based, transparent processes that are independent of political cycles. Where relevant, national governments can build capacities and empower subnational governments through regional development contracts, delegating responsibilities or providing support to subnational governments against the achievement of specific objectives or conditions (Charbit and Romano, 2017[20]). At the subnational level, cities and regions should make the most of existing capacity-building programmes and technical support tools (e.g. guidance) provided by national governments. Furthermore, they can engage in peer-to-peer learning and exchange good practices through national and international networks of cities and regions.

Collect, analyse and share data and information and local knowledge

Governments should support the collection, analysis and disclosure of sufficiently timely and granular socio-economic and environmental data that can be used to inform, assess and adjust RISC-proof blue economy policy when needed. This would involve mapping existing indicators and data sources (including private, public and civil society ones), identifying gaps, as data are often available but fragmented across different sources, and collecting data on new indicators where needed. Examples of such indicators at the subnational level are given in Table 3.2. Guidelines and regulatory frameworks to ensure data privacy and security can help build trust and encourage data sharing from third parties that might otherwise be reluctant to do so (OECD, 2023[21]). Governments should ensure that timely and regularly updated data and information on the blue economy is publicly available, preferably on a single platform, and that data and information effectively feed into policy making, including by periodically reviewing data collection, use and sharing methods to identify overlaps and synergies and track unnecessary data overload. In addition, governments should engage in local knowledge-sharing and bottom-up learning, including indigenous knowledge, to feed into blue economy policy and acknowledge local specificities, histories and heritage.

Table 3.2. Examples of indicators to measure the blue economy at the subnational level

Indicator	Unit of measure
Gross value added from the blue economy	Local currency (e.g. USD, EUR)
Jobs in the blue economy	Number of full-time equivalent jobs (FTE)
Trade in goods and services in the blue economy	Local currency (e.g. USD, EUR)
Foreign direct investment in the blue economy	Local currency (e.g. USD, EUR)
Official development assistance flows into the blue economy	Local currency (e.g. USD, EUR)
GHG emissions from blue economy sectors	Tonnes of carbon dioxide (CO_2)-equivalent
Share of water-based renewable energy in the local energy mix	Percentage
Concentration of key pollutants (e.g. nutrients, heavy metals, plastics) in rivers, lakes, coasts and seas	Milligrams per litre (mg/l) or micrograms per litre (µg/l)
Coastal and marine protected areas	Square kilometres or share (%) of exclusive economic zone area
Total material use (e.g. raw materials, energy) in blue economy sectors	Tonnes
Total waste (municipal and non-municipal) generated by blue economy sectors	Tonnes
Hazardous waste generated by blue economy sectors	Tonnes
Share of waste from the blue economy reused or recycled	Percentage
Connection rates of blue economy entities (private, public, non-profit) to wastewater treatment	Percentage

Policy coherence

Ensure effective co-ordination across water and marine ecosystems

Governments should foster effective horizontal and vertical co-ordination across government departments and agencies in charge of oceans and freshwater to ensure a RISC-proof blue economy from source to sea. National and subnational governments alike can consider: i) creating ad hoc co-ordination bodies, such as committees, commissions, agencies or working groups; ii) organising ad hoc meetings for co-ordination; iii) drawing up cross-sectoral plans with jointly designed and implemented measures benefitting both entities; and iv) sharing data, knowledge and best practices to enhance understanding of the interconnectedness of freshwater and marine systems and support evidence-based decision making. Governments can also consider bringing water and marine decision-making under a single roof. For example, the Swedish Agency for Marine and Water Management is the entity responsible for protecting, restoring and ensuring the sustainable use of freshwater and marine resources, including fisheries; similarly, one of the departmental mandates of Fisheries and Oceans Canada is to protect oceans, freshwater and aquatic ecosystems through science, in collaboration with indigenous communities.

Nurture a systems approach to blue economy policy

Governments should nurture a systems approach to RISC-proof blue economy policy to overcome fragmentation, manage trade-offs between sectors and align blue economy policy objectives with economic and environmental ones. Systems approaches aim to solve policy issues that cut across administrative and territorial boundaries by taking a holistic view (OECD, 2017[22]). They involve developing a vision for a desired future outcome, defining principles according to which the future system should operate and implementing a set of interventions to get there. By acknowledging the interdependencies between sectors of the blue economy, between blue economy sectors and ecosystems, and with policy issues related to the blue economy (e.g. climate change, water security and inequalities), governments

can create synergies between different dimensions of the blue economy and avoid decisions made in one policy sector having unintended consequences in another.

Because they focus on outcomes, systems approaches require collaboration between multiple actors across levels of government and from private, public and non-profit sectors. Governments should strive to meaningfully engage with public, private and non-profit blue economy players from all sectors (e.g. seafood, tourism, transport, port activities and energy). They can do so by mapping actors with a stake in the blue economy, defining the expected use of stakeholder inputs, and adapting the type and level of stakeholder engagement to needs. Particular attention should be paid to involving under-represented groups (e.g. low-income and informal workers, women, youth, etc.) and mitigating risks of consultation capture from over-represented or overly vocal categories. For example, Canada and the United States paid particular attention to including women and Indigenous communities in the design of their respective blue economy strategies.

A systems approach can involve defining a formal long-term strategy for the blue economy in co-ordination with relevant departments and stakeholders involved in both the design and implementation phases. Setting long-term objectives and priorities for the blue economy can help manage trade-offs between sectors, create synergies across government departments and blue economy players, and allocate human and financial resources more efficiently. In fact, survey respondents point to the lack of a clear and holistic blue economy strategy as one of the most significant challenges to the blue economy (59%). Nevertheless, designing a blue economy strategy should not be considered a panacea for resolving policy coherence issues in and by itself. Another way to ensure coherence and foster synergies with related sectoral policies (e.g. water, marine, climate mitigation and adaptation, waste, energy and land use planning) would consist of identifying, assessing and addressing barriers to policy coherence (e.g. using monitoring, reporting and reviews) and using cross-departmental co-ordination mechanisms.

Promote a "city-basin" approach to water resources management

Governments should promote a "city-basin" approach to water resources management to enhance water security (i.e. maintain acceptable levels of the risks of too much, too little, too polluted water and disruption to freshwater systems) from source to sea, to the benefit of the RISC-proof blue economy (Box 3.5). The basin is usually the scale at which it is recommended to integrate physical, environmental, social and economic aspects of water resources management. The governance model of hydrological units is increasingly widespread, providing opportunities to engage stakeholders across catchment areas, including urban areas, and involve them in actions to preserve water resources. At the national level, governments can define legislative frameworks that are conducive to the involvement of cities in basin organisations or committees. Subnational governments can consider: i) integrating the governance structure of basin organisations, from simply taking part in meetings to sitting in and/or advising executive committees, voting or taking decisions; ii) taking part in planning with basin organisations, including consultations and other forms of engagement for designing, implementing and monitoring river basin management plans; iii) exchanging data and information relative to water security in the basin (e.g. monitoring indicators for bathing water quality); and iv) jointly funding projects upstream or downstream to improve water security in the basin, city and/or region, for instance, by providing support to farmers to reduce pesticide or fertiliser use. For example, the Seine-Normandie Basin Committee in France gathers 185 representatives of national and subnational governments as well as freshwater and marine-related stakeholders to debate and reach consensus on the main orientations of water policy at the basin level, affecting freshwater and coastal ecosystems alike.

Box 3.5. Implementing the source-to-sea approach

A source-to-sea system is defined as a land area drained by a river system, comprising its lakes and tributaries (the river basin), which is connected to aquifers and downstream recipients, including deltas, estuaries, coastlines, near-shore waters, the contiguous sea and continental shelf, as well as the open ocean. As such, the source-to-sea approach seeks to address the interconnected dynamics of freshwater, coastal and marine ecosystems to foster holistic natural resources management and facilitate economic development. It is a systematic process that guides the design, planning, implementation and evaluation of projects and programmes, with the overarching objective of reducing the alteration of key flows (water, pollution, sediment, materials, biota and ecosystem services) that connect freshwater sources to the sea. Characterised by its relative expediency and adaptability, this approach capitalises on existing governance, planning and management frameworks, resulting in varied manifestations across different locations. Overall, the approach aims to define measures to mitigate disruptions in key flows while generating economic, social and environmental benefits.

Source: Mathews, R. et al. (2019[23]), *Implementing the Source-to-sea Approach: A Guide for Practitioners*, https://www.siwi.org/wp-content/uploads/2019/07/Source-to-sea-guide_webb.pdf.

Policy implementation

Set sound economic incentives and financing frameworks

Governments should set sound economic incentives and financing frameworks to catalyse financial resources for the RISC-proof blue economy and allocate them efficiently, and to "tip the playing field" in favour of more sustainable blue economy sectors or practices and more resilient freshwater, coastal and marine ecosystems. This involves:

- **Mobilising financial resources efficiently while achieving environmental objectives** by exploring and implementing economic tools that foster sustainable blue economy sectors and resilient blue ecosystems while also raising revenues. For example, instruments applying the polluter-pays principle aim to generate behavioural change (reduce pollution) while internalising the cost of negative environmental externalities. Economic instruments to foster sustainable blue economies can include taxes, charges, fees and payments for ecosystem services. Subnational governments can liaise with national ones to clarify existing financing opportunities at the national (e.g. subsidies, grant funding, loans, loan guarantees, tax credits, etc.) and international (e.g. international loans and grant funding) levels, considering that some transfers of international funds to subnational governments must bypass national ones. Subnational governments should seek to diversify sources of blue economy financing and leverage innovative instruments (e.g. blue bonds, blue carbon credits, blended finance, etc.). Adequate monitoring and reporting mechanisms for blue financing instruments should be in place and enforced to prevent corruption while enhancing integrity and transparency.

- **Channelling funding and financing to public entities, businesses and civil society** through a range of instruments, such as grants, subsidies, loans, loan guarantees and local tax exemptions. For example, through its annual BlueAct competition, the city of Matosinhos, Portugal, provides financial and capacity-building support to ten selected innovative business projects in the blue economy. Beyond providing financial resources, subnational governments can support blue economy start-ups and small and medium-sized enterprises (SMEs) by launching customers,

facilitating access to public and private funds (e.g. through awareness raising, training and having a single window for such information), implementing green public procurement and making public tenders more accessible to start-ups and SMEs (e.g. by dividing tenders into smaller lots or explicitly prioritising SMEs).

- **Allocating funds efficiently**, by clearly defining financing priorities or a financing strategy for the blue economy (in line with a longer-term vision for the blue economy if it exists), and removing counter-productive, environmentally harmful subsidies (e.g. fossil fuel subsidies, subsidies harmful to biodiversity, etc.).

Leverage regulatory frameworks and command-and-control tools

Governments should leverage regulatory frameworks and command-and-control tools to balance RISC-proof blue economy activity with environmental and social protection. Governments at all levels can use the regulatory tools and incentives under their jurisdiction, such as licenses, authorisations, permits and permit trading schemes, restrictions, extended producer responsibility, environmental impact assessments and offsetting requirements, to limit the negative environmental externalities of blue economy sectors (e.g. pollution, overfishing) on water and marine ecosystems. As with all regulatory tools, governments should ensure adequate enforcement and compliance through inspections and non-compliance penalties to give regulatory tools full force, as per the OECD Recommendation of the Council on Regulatory Policy and Governance (OECD, 2012[24]). Effective regulations, enforcement and compliance are also pivotal in preventing corruption and ensuring integrity in the blue economy.

Build an "ecosystem" of blue economy players

Governments should strive to facilitate connections and create ecosystems of blue economy players including businesses, research and knowledge institutions, universities and public entities, as well as civil society, to drive sustainable growth and innovation within the RISC-proof blue economy. To do so, governments can create innovation networks for the blue economy, i.e. initiatives that bring together a diversity of players (e.g. public research institutes, large businesses, SMEs, universities and other public agencies) into flexibly organised networks working on a range of scientific and technological innovations across different sectors (e.g. aquaculture, biotechnology, underwater robotics) (OECD, 2019[25]). For example, in the city of Lisbon, Portugal, the Sea Hub (*Hub do Mar*) connects businesses with universities, the local scientific community and researchers to help blue economy businesses grow, focusing on research and innovation, prototyping and testing activities. By facilitating collaboration between blue economy players and granting them access to facilities (e.g. spaces for pilot testing new projects, research labs in universities), such networks can help boost innovation and job creation in the blue economy.

To further boost innovation and job creation in the blue economy, governments should also ensure local education and training programmes match the needs of the blue economy. For example, in the city of New Orleans, the Office of Workforce Development works with businesses and higher education institutions to ensure that education programmes (e.g. Naval Architecture and Marine Engineering programme at the University of New Orleans) are tailored to the needs of the local blue economy. The blue economy can also be mainstreamed into broader entrepreneurship, innovation and job creation programmes. For example, Spain's *Empleaverde* programme aims to boost employment and entrepreneurship in the green and blue economy by connecting labour and environmental policies, with a focus on bringing currently unemployed people to the labour market.

More broadly, governments can create a favourable environment for the blue economy by raising awareness of the blue economy to enhance ocean literacy, especially among youth, through targeted communications, such as awareness-raising campaigns, events, employment fora and activities in schools. For example, the Sud region of France has several awareness-raising initiatives targeting different groups and objectives, such as secondary school students on blue economy jobs (Calypso programme),

sailors on reducing their environmental impact (*Écogestes Méditerranée* programme) and beachgoers and holidaymakers on protecting the marine environment (*Inf'eaumer* and Eco Attitude programmes). Scotland supported Argyll University to design an aquaculture pilot programme for secondary school pupils to raise the attractiveness of "blue careers".

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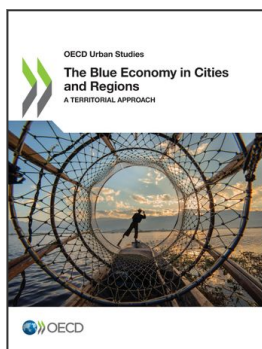
Notes

[1] The OECD uses the Intergovernmental Panel on Climate Change definition of climate resilience, which refers to "the capacity of human and natural systems to learn, adapt and transform in response to risks induced or exacerbated by climate variability and change" (IPCC, 2022[27]).

[2] The OECD defines nature-based solutions (NbS) as "measures that protect, sustainably manage or restore nature, with the goal of maintaining or enhancing ecosystem services to address a variety of social, environmental and economic challenges" (OECD, 2020[26]).

[3] The initiative is supported by the government of Scotland and 15 members including the 8 local authorities of the city region, the University of Glasgow, the University of Strathclyde, the Strathclyde Partnership for Transport, the Scottish Environment Protection Agency, the British gas distribution company SGN and the Scottish nature agency NatureScot.