Capture Fisheries

Commonwealth Blue Economy Series, No. 3

The Commonwealth

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Commonwealth Secretariat

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Acronyms and Abbreviations

ALDFG	abandoned, lost and discarded fishing gear
EBFM	ecosystem-based fisheries management
EEZ	exclusive economic zone
FAO	Food and Agriculture Organization of the United Nations
FFA	Forum Fisheries Agencies
FIP	fisheries improvement projects
FMC	Fisheries Monitoring Centre
GDP	gross domestic product
GHG	greenhouse gas
IOTC	Indian Ocean Tuna Commission
IUU	illegal unreported and unregulated
MCS	monitoring, control and surveillance
NGO	non-governmental organisation
RBFM	rights-based fisheries management
RFMOs	regional fisheries management organisations
SFA	Seychelles Fishing Authority
SIDS	small island developing state(s)
SIF	Stop Illegal Fishing
SPC	Secretariat of the Pacific Community
TAC	total allowable catch
UNEP	United Nations Environment Programme
VMS	vessel-monitoring systems
WCPFC	Western and Central Pacific Fisheries Commission
WIO	Western Indian Ocean

Summary

The marine environment provides valuable economic, social and cultural resources, which can contribute to the sustainable economic development of small island developing states (SIDS) and larger coastal states. Traditionally exploited marine resources include living resources, such as numerous species of fish and shellfish, and non-living resources, such as marine aggregates and petroleum, as well as supporting global transport and telecommunication networks. The marine environment also provides human communities with a broad range of essential services that support economic well-being and human health. Furthermore, new opportunities have emerged that are gradually being realised, including marine renewable energy and mariculture; currently, there is interest in marine genetic resources with potential pharmaceutical and industrial benefits.

With the growing threats posed by a changing climate, it is increasingly evident that we need to pay more attention to our planet's oceans. The recent concept of the 'blue economy' – which emerged during the 2012 Rio+20 United Nations Conference on Sustainable Development – recognises the need to maximise the enormous economic potential presented by the ocean while preserving it. Over the past three years or so, the 'blue economy' has been embraced by many SIDS as a mechanism for realising sustainable growth around an ocean-based economy. In that time, the idea of the blue economy has emerged as a key component of a new global dialogue about the role of the oceans and seas in sustainable development. For SIDS in particular, the concept of the blue economy presents itself as a promising avenue for economic diversification and growth embedded in fundamental principles of environmental sustainability.

The *Commonwealth Blue Economy Series* aims to support the development of the blue economy in Commonwealth member countries by providing a high-level assessment of the opportunities available for economic diversification and sustainable growth in SIDS.

This third volume in the series explores the potential for the further development of capture fisheries as a key contributing sector to the blue economy. Nearly all SIDS have a long history

of inshore fisheries, but many have suffered from over-fishing and coastal degradation. Many SIDS have also developed their offshore fisheries and, although these fisheries may involve some domestic vessels, most of the landings come from third-party vessels. These third-party vessels often also fish outside 200-mile exclusive economic zone (EEZ) limits, in high-seas waters. Management of these offshore fisheries therefore relies heavily on regional and international cooperation and has also been only partially effective, leading to some significant stock declines. Despite these problems, the capture fisheries of most SIDS continue to provide valuable sources of nutrition, income and foreign exchange; however, the benefits could be increased with more effective management.

The purpose of this report is to present recommendations that could be implemented by SIDS to protect and sustainably develop their capture fisheries within a blue economy model. The report describes some of the challenges faced in managing capture fisheries, the potential for a blue economy approach to making improvements, some suggestions for strategies and activities that could be undertaken by SIDS to further these aims, and a number of case studies illustrating positive actions that have been taken by SIDS and their outcomes.

We hope that the material presented here, together with the other reports in this series, will stimulate thinking about how capture fisheries can be integrated into the 'blue growth' agenda.

Chapter 1

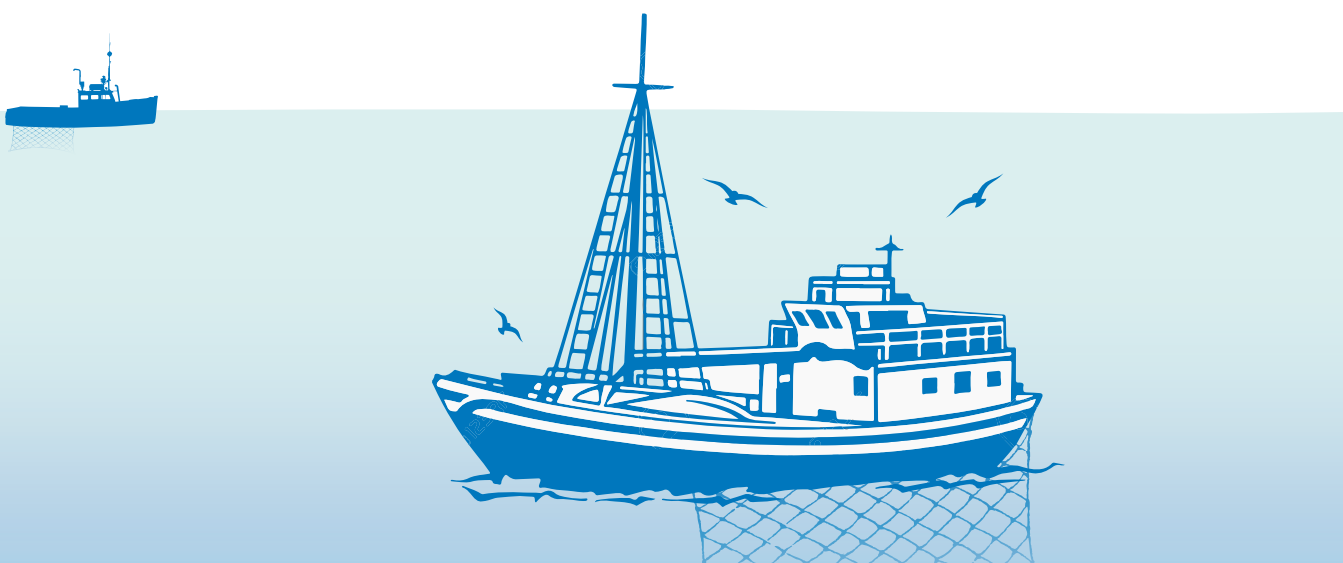
Introduction

Chapter 1
Introduction

1.1 Developing a blue economy

The concept of an ocean-based, or 'blue' economy has its origins in the 'green economy' concept endorsed at the Rio+20 United Nations Conference on Sustainable Development in 2012. Support for the blue economy at the 2012 conference from small island developing states (SIDS) emphasised the fact that their economies were largely dependent on the health and sustainable use of marine resources.

These low-lying coastal countries have in common similar sustainable development challenges, including small but growing populations, limited resources, remoteness, vulnerability to external shocks, and fragile environments. These challenges are inherent and any effective practical approaches to the development of sustainable economic opportunities from the ocean must take these factors fully on board and be relevant to the SIDS context. Many SIDS also have poorly diversified economies, relying on one or two key sectors to drive the economy. However, they have extensive marine exclusive economic zones (EEZs) and a number of them have been in the vanguard of championing the development of the blue economy as a promising avenue for economic diversification and growth embedded in fundamental principles of environmental sustainability.



In this regard, the Commonwealth has been at the forefront of promoting the blue economy as a holistic concept that can address sustainable development at multiple levels for a number of years. At their most recent meeting, in Malta in November 2015, Commonwealth Heads of Government recognised that the development of a sustainably managed blue economy offers significant opportunities for economic growth and general development for many Commonwealth states.

The notion of the blue economy refers to those economic activities that directly or indirectly take place in the ocean and in coastal areas and that use outputs from the ocean; it includes goods and services that support ocean activities, as well as the contribution that those activities make to equitable economic growth and social, cultural and environmental well-being.

The scope of the blue economy therefore includes activities that:

- explore and develop ocean resources;
- use ocean and coastal space;
- protect the ocean environment;
- use ocean products as a main input;
- provide goods and services to support ocean activities; and
- develop mechanisms to ensure the equitable sharing of national wealth (and benefits) derived from the blue economy.

The blue economy concept also encompasses economic and trade activities that integrate the conservation and sustainable use and management of biodiversity.

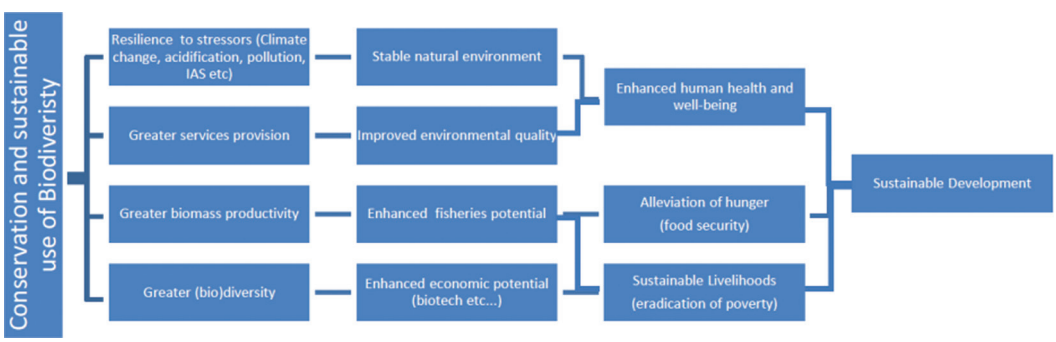
The requirement for sustainability necessitates a paradigm shift in both the mindset of those currently exploiting the oceans' resources and the diversity of ways in which the marine environment is used for the benefit of mankind. It is, therefore, inappropriate to continue with 'business as usual' and to simply re-badge the current uses of marine resources as 'blue'. By conceptualising the ocean as a development space where spatial planning integrates conservation, sustainable use, resource extraction, sustainable energy production and transport, the blue economy offers an alternative economic approach that is guided by environmental principles. It challenges the status quo, whereby oceans have been viewed as a free resource and an unlimited sink for the disposal of waste; instead, it shifts the focus so that ocean

values services are included in decision-making and benefits are shared more equitably. The successful implementation of the blue economy model (Figure 1.1), nationally, regionally or globally, will require a more integrated and holistic approach to assessing development scenarios, and their implications for society.

The blue economy will incorporate ocean values and services into economic modelling and decision-making processes, thereby helping SIDS and other maritime developing countries address equity in access to, development of and the sharing of benefits from marine resources. Optimising the benefits received from the development of marine environments in SIDS – including mariculture, marine biotechnology and marine renewable energy, as well as ongoing initiatives relating to fishery agreements, oil and mineral extraction – will require significant political, financial, logistical and scientific resource. However, the outcomes from such a strategy, including diversifying economic development, increasing export income, generation of high-value employment and enhancing international recognition, will bring real and tangible benefits.

The purpose of this report is to present recommendations that could be implemented by SIDS, to protect and develop the capture fisheries sector within a blue economy model of development and management. The report presents current challenges involved in conventional measures for managing capture fisheries, the potential for a blue economy approach to provide solutions or improvements, and a number of case studies showcasing positive actions that have been taken, their outcomes and lessons learned, especially as they relate to the challenges faced by SIDS.

Figure 1.1. The blue economy



Source: UNCSD 2014

1.2 Capture fisheries: problem analysis

This report begins by highlighting some of the problems and weaknesses in the way that capture fisheries have traditionally been managed. A key aspect is that fisheries management has often developed in isolation from other marine activities; however, there is an increasing emphasis on ecosystem-based approaches that recognise that the whole range of human activities taking place in the marine environment need to be managed in a more integrated manner. Such integration is also key to developing the blue economy so that economic benefits are maximised while damage to the environment is minimised. Many of the weaknesses in traditional fisheries management persist despite the fact that the fisheries sector generally has a long history compared with other emerging blue economy sectors such as aquaculture, marine biotech and renewable energy.

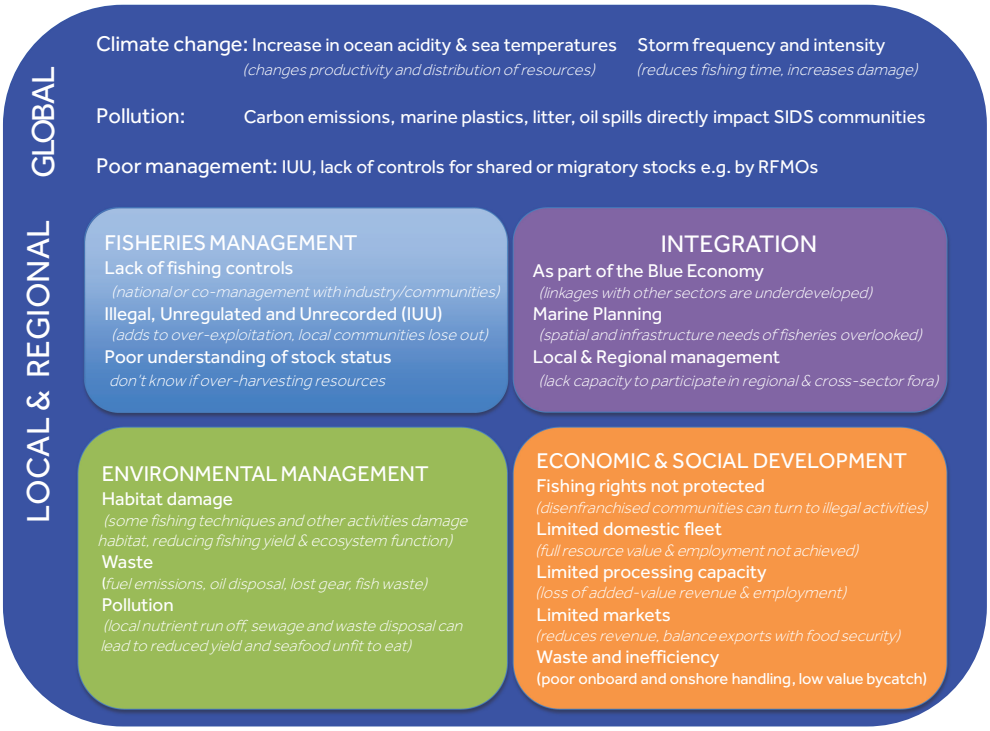
In many SIDS (and non-SIDS alike):

- Many fish stocks are over-fished and legal and illegal harvesting are not sufficiently controlled.
- There can be considerable inefficiencies in the use of fishery resources in terms of the inputs (such as fuel), the use of unselective fishing gear and poor handling of fish on board vessels and on land.
- Negative environmental impacts, such as damage to sensitive habitats and high levels of carbon emissions, are a cause for concern.
- Fisheries are often managed in a narrow sectoral context, despite the existence of strong inter-sectoral links and relationships.

Developing and maintaining a robust capture fisheries economy can be problematic because of the range of challenges at global, regional and local levels. These are summarised in Figure 1.2.

As Figure 1.2 shows, there are many global issues that affect SIDS and their fishing communities over which they have little direct control. Climate change is expected to result in increased sea temperatures and ocean acidity that will alter species abundance and distribution, but also in increased storm frequency and intensity. Fisheries-dependent communities in SIDS are also vulnerable to other global issues such as marine pollution in the form of oil spills, plastics and litter; habitat loss; and illegal, unreported and unregulated (IUU) fishing.

Figure 1.2. Global and local challenges for SIDS fisheries development



Leaving these global challenges aside, there are many aspects of fisheries management that should be under national and regional control. These principally relate to the control of the vessels allowed to fish within an area; the enforcement of allowable harvest rates; and actions to support improvements in product handling and marketing.

The Food and Agriculture Organization of the United Nations (FAO) (2014) estimated that globally about 30 per cent of fish stocks are being over-harvested and another 61 per cent are 'fully fished', leaving less than 10 per cent of stocks with room for further development. In addition, most of the world's fished stocks, which comprise more than 80 per cent of global catches, are not subject to formal stock assessments or are considered to be data deficient and, based on life history and available catch data, 63 per cent of these were considered to be over-exploited (Costello et al. 2012).

The main effect of over-exploitation is to reduce the biomass and size structure of the stock to levels at which yields cannot be maximised. It has been estimated that rebuilding over-exploited stocks could increase yields by between 15 and 20 per cent

globally (FAO, 2014; Costello et al. 2012). Over-exploitation also truncates the age range of the fish in the stock, which increases the risk of recruitment failure, so that stocks can suddenly decline or collapse, creating a risk to food security.

Over-fishing is not limited to offshore areas and/or migratory or shared stocks. Over-fishing in inshore coastal areas (through poor management and IUU fishing) has been identified as a key issue for SIDS in a recent U*nited Nations Environment Programme (*UNEP) report (UNEP, 2014). Controlling the activities of larger offshore vessels alone is often insufficient to ensure sustainable fisheries, and active management of small-scale and inshore fleets is also important, but often neglected.

The impact of fishing on rare or endangered species, such as turtles, seabirds and marine mammals, is also often poorly controlled. Species such as loggerhead and hawksbill turtles appear on the International Union for Conservation of Nature Red List of Threatened Species and are affected by fisheries. Rare or endangered species may be directly targeted by fisheries but are often caught inadvertently (by-catch). If they have no market value, they may then be discarded. Post-discard survival rates will vary depending on the resilience of the organism and how it has been caught and handled. There has been a considerable amount of research into improving gear selectivity, and relatively simple measures, such as sinking long lines to reduce the incidental by-catch of seabirds, can be extremely effective. Fishers can also be reluctant to report by-catch for fear of getting into trouble with the authorities, so confidential reporting schemes may be required to identify problems in fisheries. Once a problem is identified, potential solutions can be explored and implemented.

Coastal zones are of special importance to SIDS and frequently contain sensitive habitats such as mangroves and coral reefs. These habitats also act as important nursery grounds for many fish and shellfish species. As well as being vulnerable to direct damage from fishing, these habitats can be threatened by poor environmental management on land. Coastal habitats such as coral reefs are particularly sensitive to increased turbidity and pollution from fertilisers, chemicals and sewage. As well as damaging the habitat, such pollution can make seafood harvested from these areas unfit to eat or sell.

A key challenge faced by many small countries is how to maximise the benefits from their offshore resources. Should they

develop and manage domestic fleets, sell access rights to vessels from third countries or combine these two approaches? Selling licences to other nations involves challenges in obtaining a fair value (because of a lack of transparency in access agreements) and in properly monitoring and controlling foreign-vessel activity, given often limited domestic monitoring, control and surveillance (MCS) capabilities. However, developing a domestic fleet capable of exploiting offshore resources is also complex and requires substantial capital investment and skills training that may be difficult to secure.

Related challenges and problems emerge when seeking to develop upstream and downstream sectors associated with the catching sector in ways that maximise further value addition and employment.

Finally, it is worth noting that many challenges exist in accessing and developing markets. This can be the result of small domestic markets and their low purchasing power, and the logistical problems associated with accessing international markets given that SIDS are often geographically isolated; the vagaries of international market dynamics in terms of demand and supply; and fluctuating exchange rates.

Many of the challenges identified above are exacerbated by failures to adopt an integrated approach to capture fisheries development and management. Fisheries are a recognised part of the blue economy, but links with other sectors are often ignored or underdeveloped. There is a risk that fishing will be overlooked as marine planning develops, particularly if fisheries representatives do not participate in planning processes and constructively engage with other sectors.

1.3 The special features of small island developing states in relation to capture fisheries

SIDS face a number of special challenges that serve to heighten some of the problems mentioned above, or that are relevant in terms of potential solutions.

Fisheries often contribute a significant share of gross domestic product (GDP). In Maldives, for example, fisheries generate about 6 per cent of GDP (FAO, n.d.), and in Seychelles they generate 8 per cent of GDP (NFDS et al. 2012). In Kiribati, the value is as high as 10 per cent of GDP (Poseidon et al. 2012).

This is in part a result of historical efforts to develop the sector, supported by both national governments and external donors, but it is also because few other economic opportunities have been identified (with the notable exception of tourism, which is another key economic activity for many SIDS). However, for other SIDSs, the contribution of capture fisheries to GDP is far more limited, often as a result of poor sectoral management.

A very large EEZ is a common feature of many SIDS, especially those in the Pacific region. These large EEZs provide considerable potential to generate revenue, but generation of long-term fisheries rent in these EEZs requires effective, sustainable management of resources. This can carry a significant cost burden in terms of data collection, stock assessment and MCS, especially given the high costs of at sea and/or aerial patrols by the navy, the coastguard or dedicated fisheries inspection vessels or aircraft.

The population of many SIDS is small, and government obligations across all sectors/ministries are considerable. Many SIDS have on-island education only up to high-school level, requiring university-level education to be completed overseas at high cost. Low levels of educational capacity and limited financial resources therefore act as a barrier to higher education. The financial and human resource capabilities for effectively managing the fisheries sector are therefore often very limited.

Geographical distances to export markets are often considerable. This, coupled with the small size of many SIDS, means that the volumes of inputs being purchased and the volume of products available for export may be small and not subject to economies of scale. Private sector operators in SIDS often pay higher prices than their competitors in continental countries for inputs, and their delivery costs to market (sea or air freight) are also often higher.

Regional management is appropriate for many important migratory fish stocks, such as tuna. Migratory species are targeted in international waters or in the EEZs of SIDS by vessels from many countries. Management is normally via regional fisheries management organisations (RFMOs), but their performance has been variable (FAO, 2012). For example, the Indian Ocean Tuna Commission (IOTC) has recognised the failure of many of its contracting parties to incorporate regionally agreed resolutions into national legislative instruments and is actively working to correct such deficiencies (IOTC, n.d.).

The generation of rents from the sale of access to fish resources by vessels from third countries offers particular potential for many SIDS. However, SIDS have not always maximised the benefits, owing to a number of factors, including:

- limited negotiating capacity;
- the fact that the catches are often not landed in the SIDS because of (i) poor fisheries port infrastructure, (ii) a lack of processing/storage capacity (iii) weak purchasing power in the SIDS and (iv) the geographical remoteness of the SIDS;
- a lack of transparency regarding access agreements; and
- failure on the part of fisheries departments/ministries in SIDS that are negotiating with third countries to adequately integrate and collaborate with other sectoral interests in the SIDS, or with other, neighbouring, SIDS.

Historically, such agreements have often been secretive, but there are now moves towards greater openness and transparency. An example is the Nauru Agreement. The Parties to the Nauru Agreement form an alliance of eight Pacific island states.[1] The access and management regime is implemented through binding implementing arrangements, including a Vessel Day Scheme whereby tradeable purse seine fishing days are allocated to the parties. This approach has been successful in significantly increasing the revenues generated by the participating SIDS from the days they sell to third-country vessels (Poseidon et al. 2013).

Endnote

1 Federated States of Micronesia (FSM), Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu, the) and have worked collaboratively since 1982 to manage the tuna stocks within their national waters through the agreement.

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Chapter 2

Integrating Capture Fisheries into the Blue Economy: Changing Needs and a New Approach

Chapter 2
Integrating Capture Fisheries into the Blue Economy: Changing Needs and a New Approach

2.1 Introduction

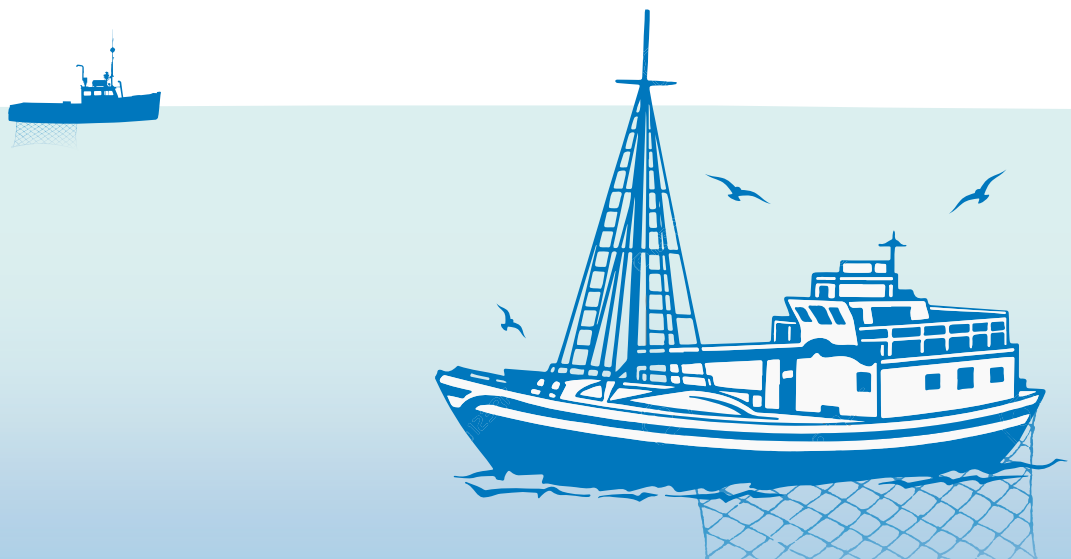
Finding solutions to the problems in capture fisheries, and making these solutions appropriate for the challenges faced by SIDS, requires a new approach.

This report argues for a logical hierarchy of objectives, strategies in support of the objectives, and outputs and activities in support of the strategies, which together represent a new approach to management of the capture fisheries sector, bringing together (i) new blue economy approaches; (ii) tried and tested methods used in new ways; and (iii) lessons learned about what works and how risks to successful management of the sector can be mitigated.

2.2 Benefits of a strong capture fisheries economy in small island developing states

With improved management and development, capture fisheries can deliver a wide range of benefits for SIDS, namely providing the following:

- nutrition for local populations, including essential vitamins, minerals and fatty acids, which are known to be required for human health (FAO, 2010);



- local income through internal sales;
- foreign revenue through exports and the licensing of fishing rights;
- employment in upstream (fishing inputs such as vessel maintenance and supply), catching and downstream (marketing, processing and distribution) sub-sectors;
- locally caught product for tourist restaurants and purchase;
- feed for cultivation activities (e.g. 'trash fish' play an important role for small-scale aquaculture operations, particularly in Asia (Fox, 2014)); and
- local income through recreational fishing businesses (including dive spearfishing).

Adopting a blue economy approach to the development and management of the fisheries sector has the potential to solve many of the current problems facing the sector.

2.3 Building Capacity and Enabling Conditions in Small Island Developing States

Creating enabling conditions for a blue economy approach can be achieved through building the capacity[1] of fisheries ministries/departments to achieve a more integrated approach. Capacity needs assessments[2] can be used to evaluate existing capacity, identify what new capacity is required and identify pathways to develop that capacity.

In assessing and developing capacity, it is helpful (and best practice (EuropeAid, 2010; Asian Development Bank, 2008)) to conceptualise four dimensions (Table 2.1).

Related to the external dimension is the need for fisheries ministries/departments in SIDS to better integrate with other sectoral interests. Integration is a key part of the blue economy approach, enabling access to human resources that might be available in other government ministries and departments or other sectors.

A more integrated approach to accessing financing with other ministries and with regional partners and projects can enable activities to be completed even in the context of the limited finances available for fisheries ministries/departments in many SIDS.

Table 2.1. The four dimensions shaping capacity and of capacity development interventions to ensure enabling conditions

	Functional dimension	Political dimension
Internal dimension	*Focus on getting the job done through consideration of*: structure/organogram, work processes, staff skills/training	*Focus on getting power, loyalties and incentives right through consideration of*: leadership, incentives, rewards and sanctions, vested interests, conflicts
External dimension	*Focus on creating an enabling environment through consideration of*: legal framework, timeliness and amounts of funding provided affecting resourcing, oversight bodies and structures	*Focus on external pressures for increased performance through consideration of*: political governance, social and cultural issues, international interests

Source: Adapted from EuropeAid (2010)

2.4 What is new about managing capture fisheries in a blue economy approach?

A blue economy approach is characterised by a newly defined set of objectives and strategies for the sector, with a focus on activities and outputs that either have hitherto not been sufficiently emphasised or need to be considered and used/implemented in different ways.

Capture fisheries have the potential to support three main blue economy objectives:

1. enhanced economic and social benefits;
2. sustainable growth; and
3. minimised environmental degradation and contribution to climate change.

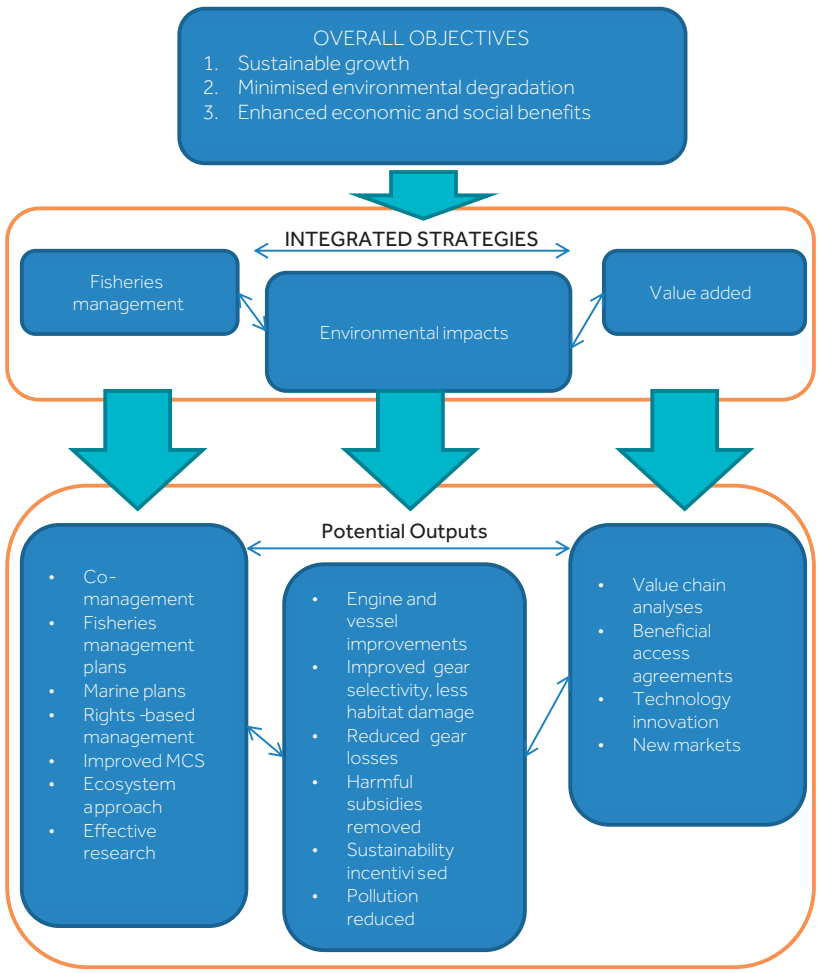
These sustainable development objectives can be achieved for capture fisheries through three strategies that, taken together, represent the fundamental approach in a blue economy framework:

1. a more integrated approach through increased participation, transparency and partnerships both within the sector and with other sectors;
2. a reduced environmental footprint, including minimised negative environmental impacts and the removal of harmful subsidies; and
3. increased value addition through technical and other innovations that increase business productivity and reduce waste.

Critical to these strategies is that they should be mutually reinforcing and linked. For example:

- Improvements in energy efficiency can both reduce costs and add value while also reducing a fishery's carbon footprint.
- Fuel subsidies (which maintain the status quo or even encourage larger, more fuel-hungry engines), can be redirected to funding efficiency technologies or shifts to less damaging fishing methods.
- Improving resource sustainability through more integrated fisheries management can help to ensure the

Figure 2.1. Objectives, strategies and outputs of a blue economy approach to capture fisheries



continued viability of fisheries, from which increased added value can be generated while also increasing resilience to climate change.

Figure 2.1 presents these objectives and strategies, along with a range of outputs in support of each of the three main strategies, in graphic form. Activities in support of the outputs are described in more detail in Chapter 3.

Endnotes

1 'Capacity' can be defined as 'the ability of individuals, organisations and society as a whole to manage their affairs successfully' (OECD Development Assistance Committee, 2006).

2 'Capacity needs assessment' can be defined as 'the process of identifying and understanding the existing situation in a country or a sector, identifying the capacity development assets and needs, and planning a series of actions to deal with such needs. There are generally a number of stages in the assessment process, but the end result is always to have a clear picture of the situation and a plan of future interventions'.

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Chapter 3

Capture Fisheries Strategies in the Blue Economy

Chapter 3
Capture Fisheries Strategies in the Blue Economy

3.1 Introduction

This chapter provides some specific examples of activities that can be implemented and outputs that can be achieved by SIDS. Not all the examples will be applicable to all SIDS, but they provide a 'menu' of potential activities to be considered in terms of applicability and priority in the specific contexts of individual SIDS.

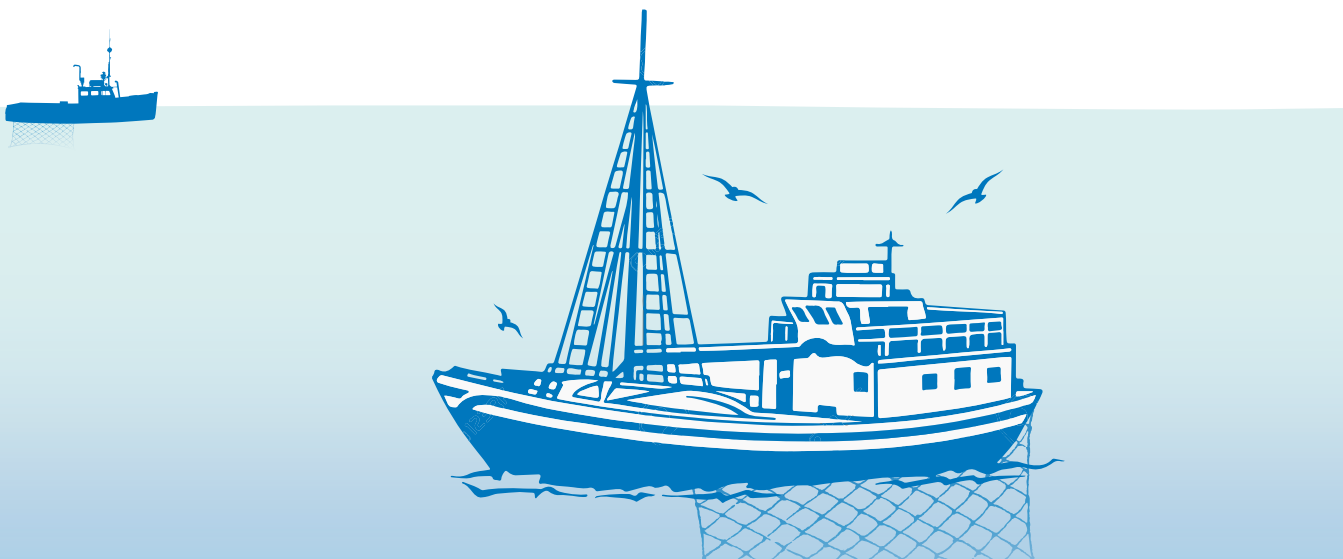
All the examples support one or more of the three main strategies described above as being essential to achieving the goals for capture fisheries within a blue economy framework.

The case studies in Chapter 6 show how some SIDS have already been successful in achieving many of the outputs discussed below.

3.2 Strategy 1: an integrated approach to improved resource management

3.2.1 Output: co-management arrangements

Co-management is a partnership approach whereby government, resource users and other stakeholders share responsibility for and, critically, authority over the management of a fishery or area. It can result in more effective management and better compliance through the integration of relevant fisheries sector stakeholders,



including fisheries ministries/departments, fishers, processors and civil society, into decision-making processes. Specific activities in support of co-management include (i) putting in place supporting legislation and policies, (ii) empowering communities to participate in co-management arrangements, (iii) establishing links between stakeholders through the creation of relevant forums and (iv) accessing and planning sufficient finance to support co-management arrangements.

3.2.2 Output: fisheries management plans

A fisheries management plan is a formal or informal arrangement between a fisheries management authority and interested parties that clearly identifies the partners in the fishery and their respective roles. The plan should detail agreed objectives for the fishery and specify the management rules and regulations that apply to it. Specific activities should include stakeholder collaboration to establish and agree the hierarchical relationships between the different intentions (policies, goals, objectives), standards (reference points and indicators) and management actions (management strategies and measures such as technical measures (e.g. gear regulations, closed areas), input controls (e.g. limits on numbers of vessels and numbers of days at sea) and output controls (e.g. quotas)). Many of the specific measures agreed may support several strategies. For example, technical measures on fishing gear may serve both to optimise the size of the fish caught and also to reduce other environmental impacts. To be successful, the implementation of agreed fishery-specific management plans require sufficient funding, suitably qualified personnel and that monitoring and evaluation procedures are followed.

3.2.3 Output: marine plans

The fisheries sector does not operate in isolation but in the context of other economic sectors such as offshore renewables, oil and gas, marine transport, tourism, and aquaculture. Historically, fisheries management has often operated in isolation and the relationship of fisheries with other sectors has not been fully considered. Marine planning is a process that attempts to rationalise the needs and benefits of all sectors operating in the marine environment in order to minimise conflicts but also to identify areas of synergy and mutual advantage. Marine

planning often incorporates a spatial element because many of the activities either take place at fixed locations or exclude other activities from areas. However, marine planning is a broader activity than marine spatial planning and should take into account wider development goals. Fisheries managers should therefore be fully engaged in integrating the fisheries sector into the planning of the wider blue economy.

3.2.4 Output: rights-based fisheries management

Rights-based fisheries management (RBFM) can reduce some of the risks of over-exploitation found in many open-access fisheries through preventing a 'tragedy of the commons'. The term refers to situations where individuals compete for a resource and their interest in achieving short-term gain overrides their interest in contributing to the long-term stewardship of the resource.

In contrast with the co-management approach discussed above, RBFM is a specific management tool (that can be introduced as part of a co-management approach and/or a fishery-specific management plan) to address the open-access nature of fisheries. RBFM is not a panacea for all problems in fisheries management and it may not be necessary or appropriate in some situations, as it brings its own challenges and issues.

RBFM creates rules that define both the right to use fisheries resources and the allocation of those resources. Thus, fishers, vessels or communities can be awarded a licence, quota or fishing right. The motivations for the introduction of such rights are both to increase the value added from the resource and to allow improvements to the management of the resource. In the long-term, RBFM can also reduce fisheries management costs by preventing the build-up of excess fishing capacity and potentially by allowing some degree of cost-recovery. However, it must also be recognised that it can be difficult to predict how resource users will respond to the introduction of new management regimes such as RBFM, so sensitively introduced arrangements that allow for flexibility in their implementation over time and an integrated approach can be important.

There are many different types of RBFM arrangements, including community rights, individual non-transferable quotas and individual transferable quotas. It is also notable that tradeable rights generally lead to different outcomes from those produced by non-tradeable systems (which generally maintain more

community-based scales and connections). Thus, activities to introduce RBFM link closely with Strategy 3 (adding value). A sensible first step is often to review the suitability of different types of RBFM tools for a specific fishery. For SIDS, that often means also considering existing traditional tenure systems that may be in place for inshore fisheries in particular.

As the introduction of RBFM creates winners and losers, its introduction needs to be carefully managed through a number of stages:

- Introduction of appropriate/associated legislation.
- Specification of the detailed arrangements for deciding who should be allocated initial rights and on what basis.
- Consideration of, stakeholder consultation on and seeking relevant advice in relation to the potentially complex issues related to transferability, i.e. should there be a marketplace for the rights and how should it operate. Important aspects include whether or not anyone can buy rights; who (or what, in the case of companies) constitutes a legitimate rights-holder; whether or not the rights should revert back to the Crown/government (like a lease) after a period of time; how, and at what level, are payments for the rights to be levied; and whether or not the Crown/government can revoke the rights, and if so under what conditions.
- Preparation of communication strategies around changes to the management regime and any structural adjustments required in the fishing fleets.
- Enactment of mitigating strategies (such as support for alternative livelihoods) for those negatively affected by the allocation of rights, recognising that RBFM is likely to involve the exclusion of some fishers/communities. This requires discussions in the broader context of the blue economy to consider, for example, which fishers/communities could conceivably transition to other livelihoods and how RBFM can be designed to take these differences into account. It is especially important from a sustainable development perspective to protect those vulnerable to the potentially negative impacts of the introduction of RBFM.

3.2.5 Output: improved monitoring, control and surveillance

SIDS often have limited resources for effectively policing their large EEZs. Activities in support of improved MCS within a blue economy strategy include:

- Enhanced integration of national activities with activities taking place at regional level. Examples include sharing of data between national administrations, vessel 'rider agreements' whereby inspectors from one country can engage with patrols in the EEZs of other countries, cross-border joint patrol activities and ensuring that agreements reached at regional level are transposed at national legislation.
- Enhanced integration of the activities of different national parties into MCS activities. For example, fisheries departments may need to better coordinate their activities with the navy/coastguard, marine police, offices of the attorney general,[1] etc. Such approaches should be coupled with risk-based strategies to better target available MCS resources. An analysis of the cost-efficiencies of different MCS activities (e.g. of sea-based versus land-based inspections to detect different types of infringements) can lead to improvements in the efficiency and effectiveness of MCS activities. Specific activities can include agreeing memorandums of understanding between parties, establishing appropriate mechanisms for parties to meet on MCS issues and to conduct joint operations, and developing and agreeing standard operating procedures that clearly lay out the responsibilities of all parties involved in MCS activities.
- Integration of new technologies into MCS, for example the use of vessel-monitoring systems (VMS), electronic logbooks and drones. Specific approaches may require legislative amendments and setting up service contracts with suppliers to install and run relevant systems. Simple VMS systems may just record the locations of vessels, but interpreting the data can be problematic, as a vessel recorded in an area may not be actively fishing. More sophisticated systems incorporate onboard cameras, sensors on winches, sorting

belt cameras, etc. These systems provide a much more complete picture of a vessel's activities. The downside is the amount of data that needs to be analysed, resulting in quite high costs (although these may be lower than the costs of deploying onboard observers). Because of this, authorities often either randomly sample such data so that a vessel does not know if it is being analysed or not, or target data on the basis of intelligence (i.e. vessels with a track record of non-compliance are targeted more intensively). Because of the cost of installing and operating these systems, they are often fitted only on larger vessels,[2] but this can mean there is a lack of data for a large segment of the fleet (usually smaller inshore vessels). There is also increasing interest in use of cheaper, mobile-telephone-based approaches, especially for smaller inshore vessels. However, offshore mobile-phone coverage could be an issue for SIDS. Data on catches has traditionally been collected using paper log sheets returned to a fishery officer ashore. An advantage of electronic reporting is that the data are captured automatically and transcription errors are avoided.

Activities associated with co-management arrangements can also serve to improve MCS through greater support for the management arrangements put in place, and through more localised enforcement by the fisheries sector and the wider community.

3.2.6 Output: ecosystem approach to fisheries

The ecosystem approach is an important and increasingly widely recognised framework for implementing the principles of sustainable resource use and development into marine management. When applied specifically to fisheries, it is often called ecosystem-based fisheries management (EBFM). Implementing EBFM helps to develop fishery management systems that seek the sustainable and equitable use of the whole system (ecological and human) to best meet the community's needs and values. It recognises that fisheries operate within the wider natural ecosystem, of which humans are a part. It also recognises that fisheries both affect and are affected by changes in the wider ecosystem. EBFM also recognises that knowledge regarding the ecosystem is never complete and that fisheries should therefore be managed using a risk-based

planning process that integrates the principles of sustainable development and adaptive management. Ensuring that an EBFM approach is actually adopted requires a number of specific activities to be conducted, related to both the planning of its introduction (including careful management of potential conflicts) and its subsequent implementation. Specific guidance and useful tools can be found at www.fao.org/fishery/eaf-net/en. It is widely recognised that co-management arrangements, fisheries management plans and wider marine plans should be designed to be consistent with the ecosystem-based approach.

3.2.7 Output: effective research

Research on fished species, habitats, the fisheries and their wider social and economic interactions can be extremely valuable when properly integrated into fisheries management. Research organisations outside of fisheries departments can also contribute through co-management and the development of fisheries and marine plans. It is important not to ignore local/customary knowledge, and the participation of fishers and researchers in regional initiatives can enhance the efficiency of research budgets and the effective dissemination of findings. For SIDS, resources to support research can be limited. However, SIDS often provide attractive locations for the involvement of non-governmental organisations (NGOs) or research partnerships with universities in other countries. Research on issues such as gear modifications to reduce incidental damage can also contribute strongly to improving resource management.

3.3 Strategy 2: a reduced environmental footprint

3.3.1 Output: improvements in engine efficiency and vessel design

The primary greenhouse gas (GHG) emissions from capture fisheries come from the fuel used by fishing vessels. To a lesser extent, the use of ice/refrigeration on board, crew mobilisation and supplies, transport of catches and emissions associated with the manufacture of vessels and fishing gear also contribute to the carbon footprint of capture fisheries. As the key source of emissions (fuel) is associated with operating costs, efforts that are successful in reducing GHG emissions should also

result in improved economic performance and opportunities for value addition (Strategy 3). Specific activities can include projects to assists vessel owners with improved maintenance of engines; guidance on appropriate engine sizes, so that vessels are not over-powered; and working with vessel designers and manufacturers to improve designs to reduce fuel consumption.

3.3.2 Output: improved gear selectivity, less habitat damage

Not all fishing gears or techniques have the same environmental impacts and countries can undertake activities to encourage more environmentally friendly approaches. For example, legislation and fisheries management plans (Strategy 1) can prohibit particular types of fishing gear, such as bottom trawls in areas of sensitive or important habitats (e.g. corals, sea grass) or drift nets where there are likely to be interactions with endangered, threatened or protected species. Fishing net mesh sizes can be increased to reduce catch of small/undersized fish; larger mesh sizes can also result in reduced drag in the water and therefore lower fuel use/costs. Particularly destructive techniques such as the use of poisons and explosives should be banned and such restrictions rigorously enforced. These developments contribute to all three strategies.

3.3.3 Output: reduced gear losses

Abandoned, lost and discarded fishing gear (ALDFG) is an issue that has generated increasing attention in recent years (Macfadyen et al. 2009), and the issue has been raised at the level of the United Nations General Assembly on several occasions.[3] ALDFG has numerous negative environmental and economic impacts, including being a hazard to safe navigation and to marine life. Depending on the gear type, ALDFG may continue to fish ('ghost fishing'), which has detrimental impacts on fish stocks and potential impacts on endangered species and benthic environments. ALDFG also results in economic and social costs that can be significant (Macfadyen et al. 2009). The transboundary nature of the problem means that integration of national action to address ALDFG with regional and international cooperation is vital.

SIDS can undertake a variety of activities to reduce ALDFG, including actions that are preventive and those that are curative.

Evidence suggests that, although both approaches are important, much of the emphasis to date has been placed on curative measures, such as gear-retrieval programmes and clean-up of beach litter (Macfadyen et al. 2009). Preventive measures (such as gear marking, the use of onboard technology to avoid loss or improve the location of gear, spatial management and the provision of adequate, affordable and accessible onshore port reception/collection facilities) may be more cost-effective in reducing ALDFG and its impacts. Such measures should be integrated into fisheries management planning under Strategy 1.

3.3.4 Output: harmful subsidies removed

The provision of subsidies to the capture fisheries sector is common throughout the world. In many cases, there are perfectly legitimate reasons for subsidy provision, for example for structural adjustment of fishing fleet capacity to better match resource availability or to support a transition to more environmentally friendly fishing techniques. Many countries, however, provide subsidies that are put in place for political reasons or to support social objectives, but which actually lead to negative impacts on fish stocks and the environment. The widespread use of fuel subsidies is notable in this regard and has been heavily criticised. SIDS can therefore act to distinguish between 'good' and 'bad' subsidies (Westlund, 2004) and ensure that the harmful subsidies are removed. An audit of the subsidies being paid and an analysis of which should be phased out needs to be integrated into fisheries management planning (Strategy 1). Subsidies paid to fisheries also need to be subject to transparency in national and regional reporting.

Incentivisation of more sustainable practices can take many forms, including government and private sector support for eco-labelling and environmental certification. Activities that might be supported by 'good' subsidies include pre-assessments and assessments of fisheries against certification standards (such as those of the Marine Stewardship Council), acting on conditions that may be imposed on fisheries under such schemes and the establishment and implementation of fisheries improvement projects (FIPs). FIPS are frequently used to provide a framework for fisheries management and sustainability improvements, with fisheries benefiting from those improvements as well as from certification achieved at a later date. For SIDS, the costs of

undertaking certification may prove prohibitive, but organisations such as the Marine Stewardship Council are developing less expensive audit processes to encourage broader participation of small-scale fisheries.

3.3.5 Output: pollution reduction

As well as resulting in GHG emissions, fisheries use many substances that are potentially polluting to the marine environment, including lubricants, paints, fishing nets and tackle, and waste packaging. Practical activities to reduce pollution can include improved management of fishing harbours to better manage the provision of fuel and deal with any spills, and better disposal of fishing waste (e.g. unwanted catch, old/unwanted fishing gear and old/scrapped fishing vessels). Poor performance in this area can clearly have negative impacts on other marine sectors, such as tourism and aquaculture, so pollution reduction from fishing activities needs to be integrated into blue economic planning. For example, redundant vessels have been sunk and used as artificial reefs, although great care is needed to decontaminate such vessels and plan their siting to avoid creating further environmental damage. A related issue is the potential for the use of greener power in harbours, allowing harbour owners to generate additional income from electricity sales to vessels while reducing noise, air pollution and carbon emissions.

3.4 Strategy 3: an integrated approach to adding value

3.4.1 Output: value-chain analysis

Value-chain analysis[4] is increasingly being used to:

- identify distributional issues and global links (in the context of globalisation);
- benchmark changes over time and performance against global competitors;
- assess the relative importance of factors affecting competitiveness;
- identify gaps and weaknesses in value chain performance; and
- identify the 'levers' and target action programmes to 'upgrade' the value chain.

Support and action for upgrading the value chain can be achieved at many levels, including the fishery itself (e.g. improved fishing methods), products (e.g. fishing for different and more valuable species) and functions (e.g. vessel owners outsourcing vessel maintenance rather than doing it poorly themselves).

Because the ability of businesses to operate profitably can be affected at multiple levels, including sourcing of inputs, undertaking their primary activity, and marketing, selling and delivering their product, there are often many opportunities for improving the value chain. Factors that can have negative cost impacts include subsidies, licensing, standards, transport infrastructure and costs, property rights, enforcement of regulations, government charges/rent collection and other costs (e.g. labour, capital, land and utilities). However, many of these 'costs' also generate positive benefits to the business, which must be taken into account (e.g. the benefits of enforcement in ensuring the long-term sustainability of fish stocks and the fisheries that rely on them).

The first step in improving value-chain performance is therefore the completion of an analysis to better understand the value chain itself and the costs and benefits of each element and to identify actions to improve areas where costs exceed benefits.

3.4.2 Output: beneficial fishery access agreements

As noted earlier, one of the features characterising many SIDS is their large EEZs. In cases where domestic fleets are not able to access offshore fishery resources, value can be generated through the sale of access rights to third-country fishing vessels. This can result in direct income as well as indirect value addition where foreign vessels source inputs such as supplies and crew, use and pay for harbour services or land fish for sale and/or processing in the SIDS in question.

Access for distant-water fishing nation vessels can be granted through a number of different mechanisms, including bilateral intergovernmental agreements (such as European Union Sustainable Fisheries Partnership Agreements), reflagging, chartering, joint ventures and private commercial agreements between foreign associations or companies and governments.

It is critical that SIDS ensure that access agreements are beneficial to them as well as to the third country. Ensuring this requires that SIDS:

- assess the benefits of different access agreement mechanisms in order to select the most beneficial mechanism;
- integrate all relevant domestic stakeholders into the negotiation process;
- build the capacity of access agreement negotiators; and
- examples of efforts to increase transparency include the information available about the content of agreements, the use of funds, and their monitoring and evaluation.[5]

3.4.3 Output: technology innovation

New technologies can make significant contributions to increasing value addition, through their potential both to reduce operating costs and to increase the sales value of fish caught. Such innovations need not necessarily be expensive and can involve simple technology, for example the introduction of chill boxes and insulated fish holds on fishing vessels. Other examples include technical improvements to vessel engines and the introduction of fish-finding or vessel-safety devices. There are also risks when new technologies are introduced, especially those that increase fishing efficiency, as this can rapidly lead to over-exploitation of the fishery's resources. There must therefore be measures within fisheries, EBFM and marine plans to adjust overall effort when this occurs. Past experience across many fisheries has demonstrated that balancing fishing capacity with resources as technology improves is one of the most challenging aspects of fisheries management.

Post-harvest waste remains a significant problem in many fisheries. Wastage results from spoilage due to insect infestation, poor implementation of traditional preservation methods such as smoking/drying, insufficient cold-chain infrastructure, poor product handling and disposal of by-products that might have commercial value. Integration with other blue economy sectors may be possible, for example the use of processing by-products in bio-tech industries or as inputs to fish farming or the agriculture sector.

Other development activities include focusing on attempts to extend the value chain by developing in-country processing capacity (as seen in Kiribati for tuna). However, the ability of many SIDS to attract viable large-scale processing sector businesses is often limited by location and by operating and transport costs. Even if large-scale processing is not financially viable, it may be possible for SIDS to engage with

activities to encourage product stabilisation (e.g. cold stores) or smaller-scale post-harvest technologies to improve value addition (e.g. new smoking/drying methods and equipment). The potential for renewable energy use in these approaches should be linked to Strategy 2.

3.4.4 Output: new marketing opportunities identified

Identifying and accessing new markets can result in significant value addition. Opportunities may lie in both domestic and export markets, as well as in accessing entirely new markets or working to improve marketing and value addition in existing markets. Activities to bring about this output might include:

- Market analysis and segmentation to identify the potential of species being caught or products being produced to be sold into different markets. This requires an understanding of both the requirements (quality, pricing, delivery schedules, batch quantities and reliability) and demand (purchasing power, competing species/products and seasonality) of potential markets.
- Preparation of marketing strategies with assigned responsibilities and costings for specific actions. A marketing strategy may include engagement with eco-labellingand wider market promotion in the form of participation in trade shows, development of brand concepts, and price and product promotions.
- Specific activities and partnerships to better integrate catching and marketing/processing sectors, such that the catching sector is supplying product to traders/processors to the desired specifications (on quality, quantity, timing and price).

Endnotes

1 Regulators and judges are frequently unaware of the financial benefits gained by fishers infringing on management rules, and of the potential negative environmental impacts. Education about such matters can serve to ensure that appropriate penalties and sanctions are demanded by prosecutors and awarded by judges, thereby serving to better de-incentivise illegal activity.

2 An interesting exception to this was in a groundfish fishery on the west coast of Canada, where it was the medium- and small-vessel owners who first installed these systems because they did not have the money or space to carry another person (i.e. an observer) on board.

3 Resolution A/RES/60/30 of 2005, Resolution A/RES/60/31 of 2005, Resolution A/RES/61/222 of 2006, Resolution A/RES/61/105 of 2006. In response to the United Nations General Assembly calls, UNEP (the Global Programme of Action and the Regional Seas Programme), through its Global Marine Litter Initiative, which includes the issue of ALDFG, took an active lead in addressing the challenge, including by assisting 12 Regional Seas around the world (the Baltic Sea, the Black Sea, the Caspian Sea, the East Asian Seas, Eastern Africa, the Mediterranean Sea, the Northwest Pacific, OSPAR (the North-East Atlantic), the Red Sea and the Gulf of Aden, the South Asian Seas, the South-East Pacific and the Wider Caribbean) to organise and implement regional activities and strategies on marine litter.

4 A value chain is a sequence of related enterprises (operators) conducting activities (functions) to add value to a product from its primary production, through its processing and marketing to the final sale of the product to consumers. The functions of each link in the chain involve sourcing inputs, making/producing and then delivering/selling product to the next link in the chain.

5 There are clear links between successful sustainable development and greater transparency of information. For example, information available from www.transparentsea.co, the World Bank dialogue with countries in the West Indian Ocean, and the new rules proposed by the European Commission (http://europa.eu/rapid/press-release_IP-15-6266_en.htm).

References

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Chapter 4

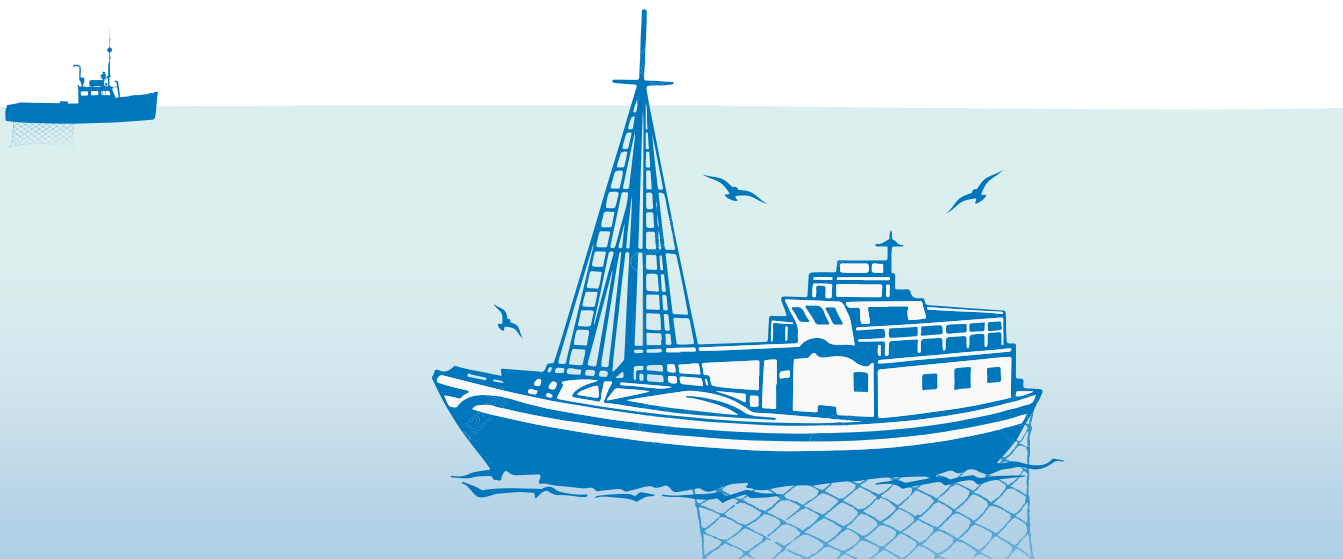
Capture Fisheries Case Studies

Chapter 4
Capture Fisheries Case Studies

The case studies in this section provide some selected examples of activities undertaken by a number of SIDS that were in line with the blue economy approach proposed in this report. SIDS should not expect to implement all the activities proposed in this report, but the case studies show that their selective implementation, based on prioritisation and local characteristics, can bring about significant benefits.

4.1 Case study: Maldives

Background: the Republic of Maldives comprises 1,192 coral islands in a chain of 26 atolls in the Indian Ocean. Its EEZ is around 923,000 km^2. Given its low-lying land, climate change is a particular environmental concern. In addition to tourism, fisheries are a major economic activity. The main species caught are skipjack and yellowfin tuna, with lesser amounts of other pelagics and a small amount of reef fish. Pole-and-line fishing using traditional boats (dhonis) accounts for around 60 per cent of the total catch, with other methods, including handlines, used for valuable yellowfin tuna. In recent years, larger, fibreglass dhonis have become more common. Around half the catch is exported and the remainder is consumed domestically in the form of fresh, smoked, canned or dried products. The export revenue is important to Maldives, to offset budget deficits and finance developmental and social objectives.



Actions taken	Outcomes
Government and private sector representatives are in regular and close communication to assess the status of the sector and discuss any actions that might be necessary by either party or collaboratively.	Although not formally constructed/defined as such, 'co-management' takes place through participation by relevant stakeholders in decision-making processes.
Development funding targeted at improving fisheries management has been obtained from, inter alia, the International Fund for Agricultural Development, the World Bank, FAO and Japan.	Significant amounts of funding have been obtained from outside Maldives; the money has been used for equipment and training.
Maldives became a full contracting party to the IOTC in 2011.	Maldives is playing an increasingly active role in the work of the IOTC, and it is integrating with regional initiatives.
A ban on all foreign longline and purse seine fishing within the Maldives EEZ has been enacted.	Domestic fishers' livelihoods are protected and there is support for expansion of the domestic longline fleet.
A programme to install VMS on the domestic fleet has been introduced, and the Ministry of Fisheries engages/integrates activities with the Coastguard.	MCS has been improved.
Highlighting the dangers of climate change for small island states (BBC, 2009) and specifying new fisheries infrastructure (such as ports, seawalls) with rising sea levels in mind.	Increased awareness of climate change impacts, and adaptive planning.
The government has engaged in a programme to educate vessel owners about the over-capacity/unnecessary size of many engines.	Smaller engines are now being introduced to vessels, reducing GHG emissions and improving safety.
Trawling is prohibited.	Sensitive habitats such as coral are protected (benefiting tourism and fisheries alike).
Projects aimed at value-chain developments in fisheries and agriculture have been supported.	Opportunities for using fish-processing waste as agriculture inputs have been identified and strategies created for developing the value chain of 'Maldive fish', a traditional boiled/smoked/dried product typically sold only domestically and in Sri Lanka.
The government privatised a tuna canning plant that had been state owned and also provided support to fresh fish processors/exporters, which largely target yellowfin markets in the EU and the Middle East.	Yellowfin exports have increased rapidly in recent years, generating benefits to the national economy and private sector businesses alike.
The rights to buy fish from different areas in the country were also privatised.	Allocations of buying rights have enabled buying companies to engage in the development of value-added products for domestic and export markets.
The Maldives Ministry of Fisheries and Agriculture administration has worked with the private sector, and other organisations, to promote local fisheries products in overseas markets.	Representatives of Maldives attended the 2014 Brussels Seafood Expo, potentially opening up new markets.
	The Maldives pole-and-line skipjack tuna fishery achieved accreditation by the Marine Stewardship Council.

4.2 Case study: Seychelles

Background: Seychelles comprises 115 islands in the Western Indian Ocean (WIO) with an EEZ of 1,374,000 km^2. The islands are generally low-lying, making them vulnerable to the impacts of climate change. In addition to tourism, commercial fisheries are economically important, with catches of yellowfin, skipjack and bigeye tuna comprising the majority of landings. Increasing quantities of other oceanic species, such as swordfish and blue shark, have also been landed in recent years (FAO, 2015). Recreational fisheries are also economically important.

Given the migratory movement of tuna in the WIO, and the position and size of the Seychelles EEZ, this SIDS is well placed to serve as the main regional hub for the purse seine fleet in the WIO. The vast majority of the frozen purse seine catch (around 80 per cent) is either landed for processing in Seychelles or transhipped through Port Victoria for processing elsewhere. This requires both canning capacity and the provision of high-quality fish-landing, harbour and vessel-supply facilities. The Indian Ocean Tuna cannery in Port Victoria, Seychelles, produces around 1.3 million cans of tuna per year, from an annual supply of tuna of around 70,000–80,000 tonnes. It is one of the largest tuna canneries in the world, with 7 cold stores to store 25 days' supply of fish. The factory has an associated fishmeal production factory, which uses the cannery's by-products and by-catch from the fleet. A subsidiary company, Ocean Products Seychelles, extracts fish oil from tuna heads.

Actions taken	Outcomes
Seychelles Conservation and Climate Adaptation Trust set up to purchase and restructure debt.	Investment in marine planning in Seychelles.
Development of a marine plan, currently in the consultation phase.	The aim is for 30% of the EEZ to become a Marine Protected Area with up to 15% of this as no-take zones. Phase I of the MSP Initiative (February 2014–June 2015) will produce a suite of design options, tools and management strategies (a blueprint) as a basis for further development and implementation of the national multi-use plan. Balancing impacts of local fisheries against those of foreign-owned purse seine fleets.

(continued)

Actions taken	Outcomes
The government has supported considerable amounts of land reclamation, with newly created island space/land being used for large infrastructure developments, including the construction of new fish-landing facilities. The government works closely with the tuna cannery and port managers to ensure that Seychelles remains an attractive place for vessels to land fish for processing (and transhipment).	Increased resilience of fisheries infrastructure to extreme weather events and rising sea levels resulting from climate change. High-quality fisheries infrastructure to attract foreign-vessel landings.
Use of tuna canning processing by-products for sale to pharmaceutical sector and as fish meal.	Additional value added to canning process.
The Seychelles Fishing Authority (SFA) has an MCS department that is based at the Fisheries Monitoring Centre (FMC). The authority comprises inspectors, observers, officers, licensing officers and VMS officers. Personnel are trained through national and regional training programmes in order to integrate and harmonise their skills and knowledge. VMS data are used for both compliance and scientific purposes and the SFA link them to logbook data to conduct administrative checks. The FMC links with other local agencies such as the Seychelles Coastguard, the National Drug Enforcement Agency, the Seychelles Police and the Attorney General's Office.	Technology is used to support MCS.
Seychelles is currently active in the IOTC compliance committee; the IOC regional surveillance project; the Stop Illegal Fishing (SIF) Working Group; the development of the Southern African Development Community Regional Fisheries MCS Centre; the Fish-i Africa project supported by SIF and the Pew Environment Group; the SmartFish programme in respect of risk assessment in MCS, data harmonisation and capacity-building.	Integration of national MCS activities with those at regional level.
The Seychelles government is working to examine the implications of IOTC resolutions and the need to revise fisheries legislation so that national legislation implements regional agreements.	Enhanced integration of national laws with regional agreements.
Seychelles has also been working to develop its own purse seine fleet catching capacity.	Increased added value to the domestic economy.
Domestic-flagged purse seine vessels are charged lower licence fees than foreign-flagged purse seiners, to encourage foreign companies to flag and base vessels in Seychelles, but licences are also sold to foreign-flagged vessels to generate important revenues for the government.	Increase in the number of domestic-flagged purse seine vessels, and significant levels of resource rent being captured by the government through licence fees charged to both domestic and foreign vessels. Foreign-vessel landings to the cannery and for trans-shipment generate considerable added value.

4.3 Case study: Fiji Islands

Background: Fiji Islands is an archipelago of more than 332 islands in the South Pacific, of which 110 are permanently inhabited. Its EEZ is around 1,290,000 km^2. Catches of yellowfin, albacore and bigeye tuna are important in the region as a whole, and a wide range of other marine organisms are also landed in Fiji itself (FAO, 2015).

Fisheries management is conducted nationally, but there is also a long history of engagement with fisheries management at higher regional levels, as well as through locally based area management. Most fisheries development work at regional, national and local levels has focused on the tuna fisheries.

There is a high degree of regionalism in fisheries management in the Western Central Pacific Ocean. For example:

- The Western and Central Pacific Fisheries Commission (WCPFC) has adopted various Commission Management Measures.
- The Forum Fisheries Agency (FFA) is an advisory body providing expertise, technical assistance and other support to its members, who make sovereign decisions about their tuna resources and participate in regional decision-making on tuna management.
- The Secretariat of the Pacific Community (SPC) is an intergovernmental organisation that provides technical and policy advice and assistance to its Pacific island members.

Actions taken	Outcomes
Participation by Fiji in relevant RFMOs (WCPFC, FFA, SPC) and the actions taken by the organisations for improved fisheries management.	Introduction of a number of regional fisheries conservation and management measures, a regional tuna management strategy and a regional strategy to reduce IUU fishing. Fiji is a party to the FFA Convention, which enhances cooperation on fisheries surveillance and law enforcement in the region.
Fiji manages its tuna resources under the national Tuna Fisheries Development and Management Plan 2014–18. The plan is renewed every 5 years and helps to ensure consistency with both regional management and national economic development objectives.	The plan sets out a cap on the number of vessels operating in the Fiji longline fishery, a total allowable catch (TAC) across all target tuna species and a TAC for South Pacific albacore (Intertek, 2015). These national management efforts, supported by effective regional management, enabled the Fiji albacore tuna longline fishery to be MSC certified in 2012. Products from this certified fishery are sold into Japan, the USA and Europe.

(continued)

Actions taken	Outcomes
With the assistance of the NGO Resort Support, in 1998 a marine 'Tabu' (no-take reserve) at Waitabu reef was established.	The action helps towards diversifying the marine economy.
Visitors pay fees to snorkel on the reef with local guides, providing income and employment in the community.	In 2004, Resort Support reported that in the 6 years after the reserve was established, fish life had increased; invertebrates, such as giant clams, had reached breeding size; and some additional revenues were being earned for the community.
Established Rural Climate Change Adaptation Project (Paeniu et al. 2015).	Local action to replant mangroves, which will aid coastal flood protection as well as improving nursery habitat for juvenile fishes.

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Chapter 5

Conclusion and Recommendations

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5.1 Conclusions

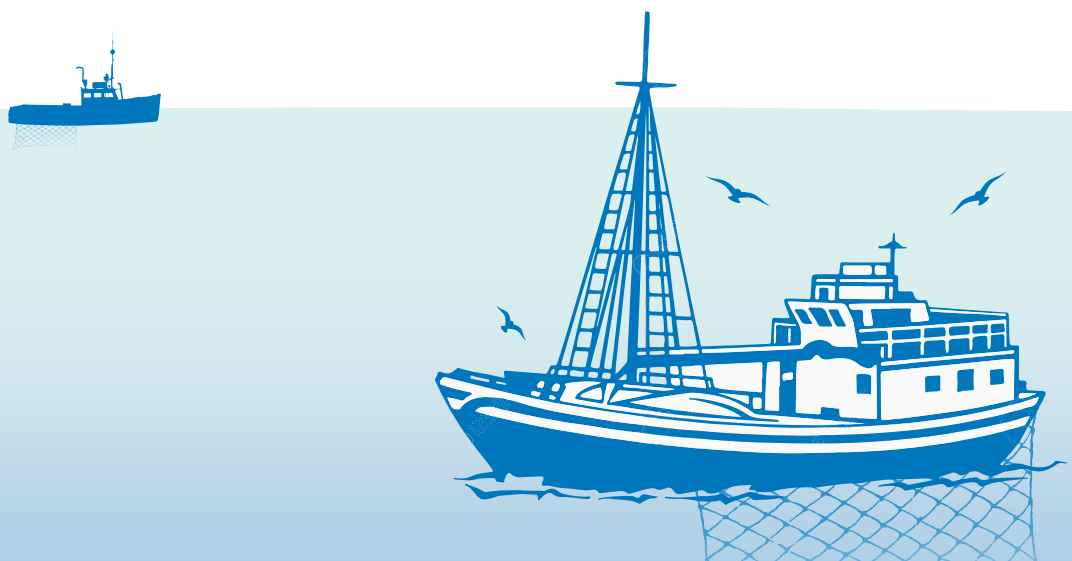
With improved management and development, capture fisheries can deliver a wide range of benefits for SIDS. However, developing and maintaining a robust capture fisheries economy involves many challenges that can be difficult for SIDS to address.

Global challenges include climate change and poor international management of some fish stocks. SIDS must recognise and take account of these when developing capture fisheries strategies as part of their blue economy.

Ineffective fisheries management leads to over-fishing, which results in lower catches than where stocks are allowed to rebuild and are maintained at sustainable levels. Over-exploitation also increases the volatility of catches and the risk that stocks will suddenly decline or collapse, creating a risk to food security.

Many valuable fisheries resources (e.g. tuna) are transboundary and therefore need to be managed at regional level. This requires SIDS to be active participants in RFMOs and to implement regional agreements at national level. However, ensuring adequate governance, control and research capacity can be a challenge for SIDS.

There are also challenges related to environmental management (habitat damage, waste and localised pollution) and social and



economic development (limited infrastructure, additional costs and inefficiencies) that affect capture fisheries.

Many of these challenges are exacerbated by a failure to adopt an integrated approach to capture fisheries development and management. Better integration is often required within the sector and, in addition, links with other sectors are often unrecognised or underdeveloped. Capture fisheries therefore need to be better integrated with all marine activities as a full partner in the blue economy.

Sustainable development objectives can be achieved for capture fisheries through three strategies that, when supported by appropriate activities and outputs, represent the fundamental approach for fisheries in a blue economy framework:

1. a more integrated approach through increased participation, transparency and partnerships both within the sector and with other sectors;
2. a reduced environmental footprint, including minimised negative environmental impacts and the removal of harmful subsidies; and
3. increased value addition through technical and other innovations that increase business productivity and reduce waste.

5.2 Recommendations for fostering the development of capture fisheries as an integrated part of the blue economy

The following recommendations for developing capture fisheries within the blue economy are made:

5.2.1 Fisheries sector profile and needs assessment

It is important to fully understand the specific needs of the fisheries sector and how it relates to other sectors in the blue economy. A sector profile should be created and an associated needs assessment conducted; these should take into account the following elements:

- resource assessment (detailing the type, extent and (where possible) the status of the fishery resources);
- fleet characteristics (numbers, gear types, capacity in relation to resources);

- social characteristics and structures;
- current legislation, regulation and control;
- port and post-harvest infrastructure;
- value-chain analysis (for key supply chains); and
- key links both with other fisheries institutions at regional and global levels and with other sectors and institutions in the national economy.

The fisheries department itself could undertake this exercise or, to better enable benchmarking and international comparison, it could be completed by external experts. The profile and needs assessment should involve consultation with as wide a range of fisheries and non-fisheries sector stakeholders as possible.

5.2.2 Blue economy fisheries development strategy

Based on the findings of the profile and needs assessment, a blue economy fisheries sector development strategy should be drafted to prioritise and refine the menu of activities and outputs available in support of blue economy strategies (see Chapter 3 of this report) so that they are appropriate to the context and characteristics of the SIDS in question.

It is important to note that this is largely a restatement and slight widening of the ecosystem-based approach to fisheries management, with the addition of economic tools and considerations. Many of the tools and approaches used in EBFM, including co-management arrangements, fisheries plans and marine plans, can also contribute towards a blue economy fisheries development strategy.

In a blue economy framework, it is essential that links between sectors are identified and that sectors' development strategies are integrated with one another. This involves adequate engagement with ministries and stakeholders representing other sectors of the blue economy at every stage of the process. Examples might include fishery conflicts and synergies with planned marine renewable energy, use of fishery by-products for local aquaculture operations, co-development of tourist and recreational fishing businesses, co-development of port facilities to service multiple sectors, etc.

Working with sectors beyond fisheries also enables potential synergies, partnerships and appropriate timings to be identified

that will help to shape the fisheries strategy, making it more achievable and effective.

5.2.3 Capacity needs assessment

A blue economy fisheries sector development strategy alone will not result in benefits: it has to be implemented. The lead partner in delivering the strategy would often be the fisheries ministry/department, supported by other stakeholders. A capacity needs assessment can identify the various dimensions of capacity that are in place and those that need to be enhanced for successful implementation of the development strategy. A series of actions to deal with such needs should emerge from the assessment, which may include institutional restructuring and capacity development (United Nations Development Programme, 2009). With those capacity needs addressed, and with political, institutional and stakeholder support, there is a greater likelihood that the emerging fisheries strategy will be implemented successfully.

Reference

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Glossary

Biodiversity is a measure of the variety of organisms present in different ecosystems.

Capture fisheries refers to the exploitation of stocks of wild fish, shellfish or other aquatic organisms.

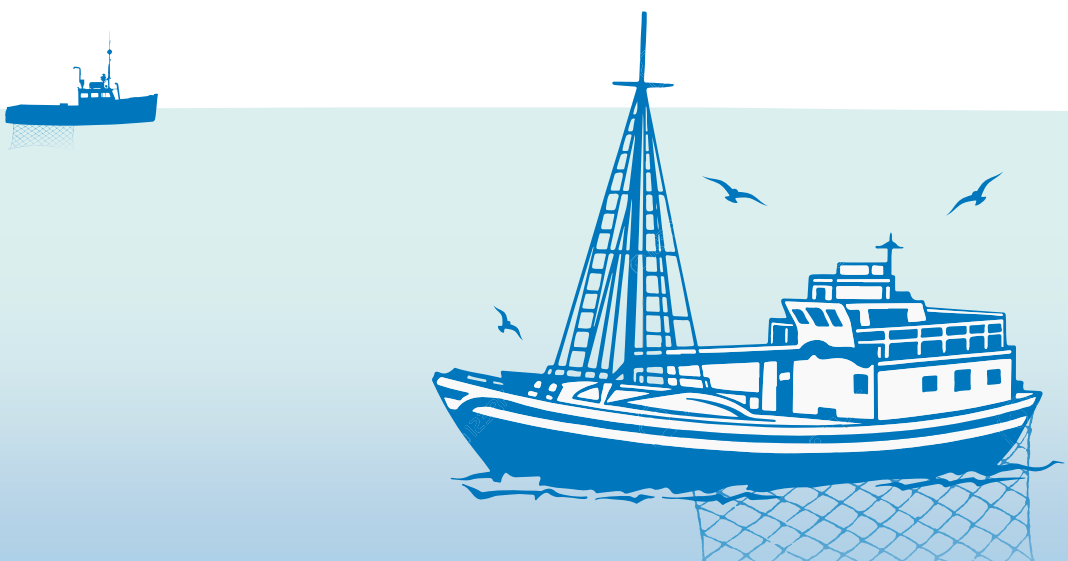
An **exclusive economic zone (EEZ)** is a zone, generally taken from the baseline (usually the mean low-water mark) out to 200 nautical miles, prescribed by the United Nations Convention on the Law of the Sea over which a state has special rights regarding the exploration and use of marine resources.

The **fisheries sector** of a country's economy typically includes a catching sub-sector (comprised of foreign and domestic vessels), businesses that service the sector (fuel supplies, vessel building and repairs) and downstream businesses that utilise the catches (direct sales and processing and marketing of derived products).

Illegal, unreported and unregulated (IUU) fishing refers to fishing in contravention of local and international laws. Unreported fishing is when no official records of catches are kept, whereas unregulated fishing is that which takes place with no controls.

Intergovernmental organisations (IGOs) are official organisations that work between governments (e.g. the United Nations).

Regional fisheries management organisations (RFMOs) are official organisations tasked with collecting fisheries statistics,



assessing resources, making management decisions and monitoring fishing activities.

Rights-based fisheries management (RBFM) uses a set of agreed rules about who can exploit a resource and how the resource should be allocated between users.

Sustainability certification: there are a number of schemes globally (e.g. the Marine Stewardship Council, Friends of the Sea) that certify fisheries, evaluating them in terms of how sustainable and environmentally friendly they are.

Territorial sea is a zone defined by the 1982 United Nations Convention on the Law of the Sea, a belt of coastal waters extending at most 12 nautical miles from the baseline (usually the mean low-water mark) of a coastal state.

Vessel-monitoring systems (VMS) are electronic systems designed to record and report a fishing vessel's location and perhaps, depending on the system's degree of sophistication, activity to a regulatory authority.

The Commonwealth

The Commonwealth Blue Economy series aims to support the development of the blue economy in Commonwealth member countries by providing a high-level assessment of the opportunities available for economic diversification and sustainable growth in small island developing states (SIDS).

This third volume in the series, capture fisheries, presents recommendations that could be implemented by SIDS to protect and sustainably develop their capture fisheries within a blue economy model. The book describes some of the challenges faced in managing capture fisheries, the potential for a blue economy approach to making improvements, some suggestions for strategies and activities that could be undertaken by SIDS to further these aims, and a number of case studies illustrating positive actions that have been taken by SIDS and their outcomes.

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