

Confidential

Alternative Future Visions for the Seychelles Blue Economy

Background Document for the Meeting of
Senior Officials and Commonwealth Advisers

3-5 August 2015, Marlborough House, London



The Commonwealth

1 Introduction

1.1 Background

In order to implement the Blue Economy concept, the Government of Seychelles is developing the National Blue Economy Roadmap. Through the development of the roadmap, the Government of Seychelles aims to provide a holistic approach to the sustainable utilisation of marine resources, with consideration of the implications for current activities on the oceans, and the realization of future potential opportunities and maintenance of ecological function and integrity.

The roadmap will consider a range of marine-based sectors by developing key themes including, but not limited to, sustainable finance and investment frameworks, coherent cross-policy development, fostering of indigenous skill and research capacities and perhaps most notably the synergistic integration of pertinent sectors to form an effective Blue Economy development strategy. The purpose of the Blue Economy Roadmap is, therefore, to set the broad direction for future investment in and development of a sustainable, ecologically sound, ocean-based economy in Seychelles.

While considerable progress has been made in the development and definition of the Blue Economy concept for Seychelles, recent discussions with senior officials highlight a lack of clarity on the future vision for the Seychelles Blue Economy, what the future development strategy should be and what “transformative actions” will be required to achieve the full opportunities that the Blue Economy offers.

It was therefore agreed that an additional step should be included in the process to enable senior officials to broadly define future vision for the Seychelles Blue Economy.

1.2 Purpose of the Meeting and Outcomes Sought

The purpose of the meeting is to bring together senior officials from the Government of Seychelles to meet with Commonwealth Advisers and external experts, to explore a range of future possible scenarios (Visions) for the Blue Economy and to determine, if possible, the preferred development path for the Seychelles Blue Economy. Once defined, this preferred development path will form the basis of the Blue Economy Roadmap document which will, *inter alia*, define a series of critical paths towards achieving the preferred Vision.

The key outcomes from this meeting are therefore:

1. To identify key priorities for the Seychelles’ Blue Economy and to progress towards a shared future Vision;
2. To describe the enabling conditions (capacity, infrastructure, investment, technological development, governance reforms, scientific knowledge and research programme etc.) required to realise the preferred Vision;
3. To broadly understand the constraints (cost, political will, lack of capacity etc.) to implementing those enabling conditions as well as the “transformative actions” required to overcome those constraints; and
4. To better understand what additional studies will be required to more fully explore the development scenarios with key actors and stakeholders.

The meeting also provides an opportunity for three key inputs to the Blue Economy Roadmap project, commissioned by the Commonwealth Secretariat, to be presented to senior officials and the Blue Economy Department.

The outcomes of this meeting will be used as the basis for a series of advocacy activities with Ministers to reach agreement on a whole-of-government approach to realising the Blue Economy in Seychelles.

The purpose of this discussion document is to present a number of alternative development scenarios ('future Visions') as a means to support and stimulate discussions during the meeting.

2 Blue Economy

The concept of an ocean-based, or 'Blue' economy has its origins in the 'Green Economy' concept endorsed at the United Nations Conference on Sustainable Development. At the core of the Blue Economy is the de-coupling of socio-economic development from environmental degradation. To achieve this, the Blue Economy is founded upon *inter alia* the assessment and incorporation of the real value of the natural (blue) capital into all aspects of economic activity.

The notion of the Blue Economy refers to those economic activities that directly or indirectly take place in the ocean and coastal areas, use outputs from the ocean, and places 'goods and services' into ocean's activities as well as the contribution those activities make to equitable economic growth, social, cultural and environmental wellbeing.

The scope of the Blue Economy therefore includes:

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

The Blue Economy concept also embodies economic and trade activities that integrate the conservation and sustainable use and management of biodiversity. In this regard, the Blue Economy also supports sustainable livelihoods and food security for island and coastal communities.

In developing the Blue Economy Roadmap, the Government's overarching goals are:

1. **Economic diversification** - to reduce vulnerability from reliance on a small number of existing sectors and to increase the %GDP derived from marine sectors;
2. **Creation of high value jobs** - while unemployment levels in Seychelles are not high, the creation of higher value jobs is seen as a priority;
3. **Ensure food security** - through effective and sustainable utilization of marine resources; and
4. To achieve these goals while **sustaining the ecological integrity of the marine environment** of Seychelles and its ability to support the livelihoods of present and future generations of Seychellois.

The outcomes to be achieved from implementation of the Blue Economy concept in Seychelles therefore include:

1. Increased investment in existing ocean-based economic sectors to realise greater value from the existing resource base;
2. Stimulate development of new economic sectors based on existing marine resources;
3. Increase the number of businesses operating and the number of people employed in the Blue Economy;
4. Achieve greater protection for Seychelles ocean space and resources through better coordination across different sectors, application of protective measures and greater use of surveillance and enforcement tools; and
5. Generate new research, innovation and knowledge about Seychelles' ocean space and management needs.

2.1 Characteristic of the Blue Economy

Whilst no universally agreed definition exists for the Blue Economy, it is possible to describe what the Blue Economy may look like by the prominence of certain characteristics. A review of approaches to the Green Economy highlights six strongly inter-linked characteristics that would be prominent in a Blue Economy:

1. Recognises the value of and invests in natural blue capital
2. Maintains growth, fosters 'blue' business and promotes jobs in 'blue' sectors
3. Promotes energy from low-carbon and renewable sources
4. Addresses resource scarcity and promotes enhanced resource efficiency through improved and enhanced natural resource management
5. Ensures resilience from foreseeable impacts of climate change through developing adaptive capacities
6. Grows the human capital to act

Further details of these characteristics are provided in the Appendix to this document.

3 The Importance of Marine Economic Activities

Marine uses and activities already contribute significantly to the overall economy of Seychelles, through direct economic activities, indirect support to service industries and the provision of ecosystem services. Applying a modified version of the analytical framework developed as part of the EU Blue Growth study,¹ the major beneficial uses of the marine environment can be categorised under six “maritime function” headings: Ports and shipping; Food, nutrition and health; Energy and raw materials; Tourism and leisure; Habitats, marine eco-system services and coastal protection; and Maritime monitoring and surveillance.

Within each of the maritime functions, a number of different economic activities may be identified and are discussed in more details in the Appendix.

The EU Blue Growth study also applies a categorisation to the different economic activities, namely **Mature Economic Activities**, **Growth-stage Activities** and **Pre-development Stage Activities**.

Mature economic Activities

These activities currently are the bedrock of Blue Growth and provide high levels of value addition and employment. The main challenge for these activities is to continue to perform in the light of strong external pressures and fierce competition from global players. Much will depend on the strategies and business models implemented and on the ability to adopt increasingly sustainable practices, and to export to global markets. Examples of mature stage activities in Seychelles include the tuna fishery, the tourism industry, domestic ferries and international shipping.

Growth-stage Activities

These are the maritime economic activities which already have critical mass at a global level, which have already grown during the last five years and which can further grow in the years to come. While these may create immediate employment opportunities, important investments and preconditions are required to achieve the full potential of these activities. Activities in this category may not have developed in Seychelles but capacity and infrastructure may exist to support their establishment. One such example is marine renewable energy.

Pre-development stage Activities

These are new and emerging activities that may still be at the R&D stage at a global level and where no capacity or infrastructure currently exists in Seychelles. These will take time and investment to develop in Seychelles and will require a long-term view. Blue biotechnology would be an example of a pre-development stage activity.

¹ *Blue growth: Scenarios and drivers for sustainable growth from the oceans, seas and coasts*. Third Interim Report prepared for the European Commission, DG Mare. March 2012

4 Future Blue Growth Scenarios (Visions)

The concept of the Blue Economy is not new to Seychelles. Seychelles has benefitted from its ocean resources for more than 200 years with its development of fisheries, its reliance on international and domestic shipping to support trade and its tourism industry that has developed tremendously over the past three decades. However, a future-oriented Vision should not only focus on what is important today, but hone in on what can be expected tomorrow.

4.1 Future Visions

To support the discussions during this meeting, this report develops four possible and contrasting scenarios (or 'future visions') for Seychelles, which describe how the Blue Economy might develop over the next 15-20 years. The four scenarios are: **Business as Usual**, **Slow & Steady**, **Real Transformation** and **True Blue World**. Each of the four scenarios is elaborated with respect to the six maritime functions described in section 3 above.

The differences between these four scenarios are a result of alternative paths of development based on the degree to which the six Blue Economy characteristics described above are developed, as well as the priority placed in the different maritime functions and activities discussed above. The four scenarios also assume certain framework conditions are put in place to enable growth of the Blue Economy.

4.2 Interpreting and Applying the Scenarios

It is useful to provide some guidance to allow the reader to better understand and interpret the four scenarios detailed below:

1. The scenarios are not meant to represent specific defined futures, but rather are illustrative of the extent to which Seychelles could develop the concept of the Blue Economy, given certain conditions.
2. The four scenarios represent different stages along the continuum of implementing the six characteristic of the Blue Economy, from their most limited application (Business as Usual) to the point where the characteristics are fully developed as far as they can be (True Blue World). The reality will probably lie somewhere in between the two and the process to be developed during the meeting will help to establish how far participants are comfortable developing this concept.
3. The four scenarios are not mutually exclusive. Different maritime functions may be developed to different extents depending on the priority attached to them. Hence, the scenarios when viewed together provide a 'cook book' of ideas that can be combined in many different ways. Discussions with the technical experts will help participants to better understand the feasibility of developing the different maritime functions to different degrees.
4. The scenarios are developed on the basis of certain assumptions which may or may not materialise. The meeting will provide an opportunity to discuss some of these assumptions.

In considering these scenarios, a number of questions may help to frame the analysis, for example:

1. What are the key national development priorities and drivers that influence the future scenario? Does the scenario respond to these?
2. What are the key environmental threats and issues that need to be addressed to support Blue Growth under the specific scenario?
3. What are the main policy drivers that support this scenario and what are the conflicts that might arise under this scenario?
4. How does the scenario embody the principles of the Blue Economy, and how does this differ from current operations?
5. Who's role would change under this scenario?
6. What institutional responses are appropriate and what steps are stakeholders willing to take to achieve the vision?
7. Who benefits and who loses under this scenario - what are the trade offs?

'Business as Usual' Future

The 'Business as Usual' future Vision assumes that the major focus is on maintaining and developing the existing mature stage economic activities.

Economic activity remains at current levels but with few sectors. Much of the potential value from the tuna fishery is transferred abroad due to the poorly developed value chain. Existing development plans progress but no major innovations are made. Governance of the marine environment remains sectoral and conflicts between different marine users threaten to escalate. By 2030 certain resources and habitats remain under pressure and may be irreversibly damaged without intervention. Collapses of some stocks affect local communities, and conflicts arise due to conflicting priorities. The 'economic value' of marine ecosystem services is not reflected in national accounts and, as a consequence, they continue to be ignored in economic and development policymaking processes.



Ports & Shipping

- Existing development plans progress with Zone 14 and related infrastructure
- Existing risks from pollution, ballast water, air pollution etc are not addressed
- Port related fees and levies continue to lag behind international benchmarks thereby denying the Port Authority and Government of valuable sources of revenue



Tourism & Leisure

- Sun, sea, sand remains the primary attraction for international tourists
- Gradual increase in the number of cruise ships visiting Seychelles
- Seychelles increasingly popular as a yacht cruising destination
- Increasing pressure from tourists on marine resources and the coastal environment
- Sector remains vulnerable to global shocks



Food, Nutrition & Health

- Maintaining the tuna fishery is the main driver with the EU as the biggest trading partner
- Demersal fishery remains open access and overfished with existing subsidies in place leading to collapse of some species
- Pressure to exploit more fishery resources
- Proportion of fish in diet continues to decline
- Wait for exploitation ideas to be "seen" and developed by local entrepreneurial individuals*
- Wait for exploitation ideas to be "seen" and developed by external entrepreneurs and/or commercial organisation
- Passively allow international bioprospecting / exploitation under current legislation



Habitats & Ecosystem Services

- Existing MPA coverage is extended but seen as inadequate due to lack of integration with other measures
- Designation of MPAs controversial due to ongoing conflicts between resources users - zoning fails due to conflicts and underlying inadequacy
- Loss and damage to marine habits and species continues and exacerbated due to conflicts in in uncoordinated resources exploitation and inadequate enforcement
- MES given limited consideration in policy making due to lack of data on their value and their economic contribution
- Certain habitats remain at risk of damage due to lack of coordinated governance framework



Energy & Raw Materials

- Energy consumption increases with limited or no energy generated from marine renewable sources
- Increasing demand for imported fuel with associated vulnerability to price shocks
- Continue promoting Seychelles as a petroleum province
- Offshore hydrocarbon production >100,000 boe/day
- Dredging and aggregate extraction continue as a source of building material and to support shoreline reclamation
- Continued installation of PV solar energy based on current incentives regime



Monitoring & Surveillance

- Continued reliance on surface platforms for in-situ monitoring
- Major effort remains focussed on piracy
- Costs of fishery monitoring and enforcement increases
- VMS deployed in fishing fleet
- No maritime domain awareness achieved due to multiple agency involvement
- Limited ability to police offshore waters to identify and control illegal and unregulated activities

'Slow & Steady' Future

The 'Slow & Steady' future Vision assumes that the mature stage economic activities are transformed to achieve more sustainable long term performance with some limited development of specific Growth Stage activities to diversify the economic base.

The demersal management plan is implemented to introduce better management controls. The Government pioneers the use of Blue Bonds as a finance option for fishery improvement projects. A greater emphasis is placed on extending the value chain around the tuna fishery - by 2030 Seychelles is a key exporter of high value tuna-based products. Limited single species mariculture develops to support domestic consumption. MSP developed as a key decision making tool helping to balance competing demands and optimise resource use.



Ports & Shipping

- Introduction of more efficient and cleaner ferries to service the inter-island trade routes
- Seychelles fully compliant with IMO Flag State Implementation requirements
- Seychelles implements strict Port State Control measures to target high-risk/low quality ships
- Port Victoria develops gradually as a hub for the Blue economy
- Dedicated cruise ship terminal developed to separate passengers from commercial port
- Reforms to existing fees and levies gradually bring them in line with international benchmarks



Tourism & Leisure

- Moratorium of large resorts permanent with the focus on small scale/high value eco-tourism operations
- Increasing focus on marine based tourism operations
- Increasing use of "user-pays" charges for access to the most pristine areas
- Zero discharge policy for all marinas and yachts in coastal waters



Food, Nutrition & Health

- Demersal Management Plan fully implemented but fishery remains open access with subsidies.
- Increase in the amount of tuna processing taking place due to new facilities
- Limited development of aquaculture based on fin-fish production, using foreign expertise and investment
- Lack of capacity within the aquaculture industry means Seychellois are employed at the production level as opposed to technical and management levels
- Pilot bio-refinery plant operating to process tuna processing waste
- Procedures and mechanisms implemented to maximise benefit from biological resources (Nagoya protocol adherence)
- Lack of technical capacity will limit potential to develop local SMEs



Habitats & Ecosystem Services

- Seychelles revises its marine spatial plan and biodiversity targets to achieve more meaningful integration with other sectors
- Existing data and knowledge on Seychelles marine ecosystems is collated and centrally available for planning and decision making
- Seychelles develops limited innovative financial products based on a recognition of the value of ecosystem services (Blue Bond)
- Better understanding of the value of ecosystem services is integrated into planning and decision making
- New measures have been implemented recognising blue carbon values alongside other MES as part of an integrated biodiversity strategy
- University of Seychelles is a catalyst for increasing and improving knowledge of the marine environment



Energy & Raw Materials

- Petroleum production >100,000 boe/day
- Increased revenue from petroleum results in a loss of momentum for developing other areas of the Blue Economy
- Electricity grid updated to allow further penetration of renewable energy production
- Testing of small scale wave device in Seychelles but owned and managed by international company
- Installation of offshore wind farm



Monitoring & Surveillance

- Greater coordination and collaboration among agencies and regional partners leads to economies of cost thereby allowing greater monitoring and surveillance activities to be undertaken in the EEZ
- Seychelles pilots a 'self-monitoring' programme for artisanal and semi-industrial fisheries
- Use of AIS and VMS fully applied to Seychelles waters

'Real Transformation' Future

The 'Real Transformation' future Vision assumes large scale development of Growth Stage activities resulting in a well-diversified economic base and the creation of new jobs.

The Government invests in the development of new sectors including supporting the development of key capacity and research and development to support innovation-driven sectors. A large number of locally (co)-owned SME's operate in blue growth sectors including blue bio-technology. Major investment made in multi-species mariculture facilities. Seychelles supports a thriving marine science sector with collaboration from overseas institutions. Small scale marine renewable energy infrastructure provides energy to local communities away from the main centre of Victoria.



Ports & Shipping

- Port Victoria supports the largest fish processing and post-processing facilities in the WIO on the basis of the 'circular economy' (zero discharges, waste and emissions)
- Port Victoria is self-sufficient in energy from renewable sources
- Progressive regime of fees and levies creates income for the Port Authority that is reinvested into better and more efficient facilities



Tourism & Leisure

- Seychelles reaches its "carrying capacity" for tourists and now focusses on adding value to the existing product - higher value tourists rather than more tourists
- Tourism sector supports the establishment of a large number of SMEs providing products into that market



Food, Nutrition & Health

- Seychelles operates a domestic tuna fishing fleet
- Demersal fishery is fully managed with access arrangements and zero subsidies
- Aquaculture industry based on a mix of small and large enterprises, with a diversified range of production systems
- Aquaculture supplying both international and domestic markets
- Both fin-fish and bivalves/seaweed cultured in integrated systems in accordance to the Ecosystem Approach
- Significant local capacity to manage and perform technical functions on the farms
- SMEs or community based aquaculture (domestically owned) producing high value niche products such as coral for the aquarium trade or sea cucumbers for the Asian market
- Most of the value chain (e.g. feed production & product processing) and supporting services contained within Seychelles
- Biotech industry based on a mix of small enterprises, with a diversified range of products & services
- Primarily supplying both international markets, but with products feeding into the local tourism sector
- Local facilitation funding & foreign investment needed to develop a vibrant sector
- Significant local capacity/ critical mass to manage and perform technical functions associated with biotech sector
- SMEs or community based enterprises (domestically owned) producing high value niche products



Habitats & Ecosystem Services

- Multi-sector planning becomes the basis for all conservation and development activities - land-based planning and development is fully integrated with marine planning and development
- Decisions concerning future conservation measures are taken on the basis of good scientific knowledge
- Impacts on the marine environment arising from land-based activities are fully controlled
- New markets are created for biodiversity research and study as a result of recognition of the connection between the environment and blue economy sectors
- University supports and facilitates international research into products and services that can be derived from the Seychelles marine environment
- Key marine habitats are mapped with data being applied to adaptive management



Energy & Raw Materials

- Revenue from offshore hydrocarbon production supports development of blue-biotech sector
- 60% of Seychelles energy needs provided by renewable sources - predominantly solar but with 2 new wind farms and a commercial scale wave energy project
- Seychelles becomes a sponsoring State with the ISA for exploitation of minerals in the Area



Monitoring & Surveillance

- Single integrated agency covering surveillance of the maritime domain
- Use of independent observers on fishing vessels is widespread
- Strong penalties are applied to those caught undertaking illegal activities that damage the marine environment and its resources

'True Blue World' Future

The True Blue World future Vision results in Seychelles abandoning fossil fuel based energy generation and developing a significant biotechnology industry which supports and develops other pillars of the economy.

Unsustainable economic activities are phased out and replaced. Existing fisheries achieve zero wastage, with by-catch either avoided or fully utilised. The Government abandons plans to develop Seychelles as a petroleum province. Renewable energy provides most, if not all of Seychelles energy needs. The True Blue World scenario assumes high levels of environmental protection and full accounting of the economic values of marine ecosystem services. The major thrust is on the development of a high tech 'blue bio-technology' sector which is internationally recognised resulting in the development of a highly skilled workforce.



Ports & Shipping

- Strict port state control measures results in only the 'greenest' ships visiting Seychelles including bio-security and pollution prevention controls
- Emissions from visiting vessels reduced by connecting to shore power while in port
- Solid waste from ships is treated in a bio-refinery
- Port Victoria established as the Blue Economy hub with a dedicated Science Park linked to the University and high-tech processing and post-processing facilities



Tourism & Leisure

- Seychelles tourism product is globally recognised and intrinsically linked to the Blue Economy
- Private and/or civil society agencies manage and support a network of coastal MPAs thereby reducing costs to government, improving visitor experience and contributing to biodiversity conservation targets
- The Seychelles 'Spa Experience' is intrinsically linked to the Seychelles 'Blue Healthcare' industry



Food, Nutrition & Health

- The tuna fishery value chain is fully developed resulting in higher returns for the same effort
- Zero wastage through processing and post-processing
- Well-developed indigenous Blue Biotechnology sector (employs >500 people)
- Aquaculture part of a circular economy in partnership with the fisheries, biotechnology and agriculture sectors
- Majority of aquaculture production based on shellfish and seaweeds for a range of high value food and non-food products
- Seychelles seen as a R&D centre for the regional and international industry
- Biotech part of a circular economy in partnership with the fisheries, aquaculture, tourism and agriculture sectors
- Seychelles seen as a research and development centre for the regional and international industry



Habitats & Ecosystem Services

- Integrated and effective marine habitat, species and ecosystem protection achieved by full integration and enforcement of biodiversity objectives. This delivers the 30% protection target and wide spatial protection measures within an overall Seychelles sustainable development zoning plan
- Seychelles takes a global lead on the fight against climate change as a "living laboratory" studying the role of the oceans in mitigation of climate change under the auspices of the Seychelles Oceanographic Institute



Energy & Raw Materials

- Seychelles abandons plans to develop offshore petroleum in a bid to show global leadership on climate change
- >80% of energy generation comes from renewable sources including algae-based biofuels
- Development of wave energy projects with community ownership of off-grid renewable energy projects
- Extraction of aggregates (if any) takes place in offshore waters thereby protecting coastal environments
- Seychelles is a major global player in deep sea mining development



Monitoring & Surveillance

- Seychelles has a comprehensive maritime domain awareness system, truly integrated across all relevant agencies
- Access to satellite-based remote sensing platforms provides 24/7 affordable real-time monitoring of the entire EEZ allowing targeting of surface-based platform resulting in full compliance with fishery and shipping regulations
- Comprehensive ocean-based environmental monitoring programmes are in place in collaboration with other WIO partners

5 Shocks and Discontinuities

One important function of scenario development is the exploration of potential disturbances that may affect the realisation of those scenarios. Once the scenario is determined, the next stage could be to understand the disturbances faced. These disturbances usually take two forms:

Shocks

Shocks are sudden events that impact on the vulnerability of the system and its components. There are many different types of environmental shocks that can strike at different levels. These could include natural events, such as a sudden and rapid increase in the number of storm events and the associated impacts such as inundation of coastal infrastructure, high rates of coastal erosion, or man-made shocks such as an oil spill from an oil tanker.

Discontinuities

Discontinuities may be long-term trends that undermine the potential of a given system or process and increase the vulnerability of actors within it. These can occur when sustained pressure on resources combined with environmental degradation overwhelms the carrying capacity of an ecosystem to continue providing services and sustain human use. These discontinuities occur when ecosystems absorb stress over long periods of time without much outward sign of damage but eventually are pushed to the limits of their resilience.

Examples of these types of disturbance could include spatial (latitudinal) shifts in the distribution of commercial species and stocks caused by changes in water temperature or the impacts on local species arising from the introduction of non-indigenous marine species that settle and colonise in Seychelles waters.

Another example would be increases in ocean acidification impacting the growth of shellfish which may impact shellfish based mariculture industries.

A key component, and critical success factor, of the Blue Economy approach must therefore be the extent to which it builds flexibility and capacity to deal with the unexpected - its “adaptive capacity”.

6 Measuring Success

While defining a future Vision may be relatively easy, measuring the extent to which that Vision is achieved will require the definition of specific targets and measures to track progress towards achieving the specific Goals. While it may be appropriate to set a high level, overarching target such as “**double the contribution to GDP of the ocean-based economy**” there is also a need to disaggregate this for key activities of the overall Blue Economy.

It should be noted that such targets should not be seen as the ‘boundary to ambition’ for the activities, but should be a realistic and achievable target. A number of indicative targets are suggested below but it should be understood that in defining the final Blue Economy Roadmap, consideration will need to be given to determining a set of realistic and achievable measures and targets against which to track the implementation of that roadmap.

Target	Measure
Proportion of GDP derived from marine sectors	<ul style="list-style-type: none"> • % GDP
Volume seafood landed and processed	<ul style="list-style-type: none"> • Quantity / Value
Number of jobs supported by marine sectors	<ul style="list-style-type: none"> • % total jobs
Contribution of different sectors to GDP	<ul style="list-style-type: none"> • % GDP
Average salary for jobs in marine sectors	<ul style="list-style-type: none"> • SR
Proportion of energy generated from renewable sources	<ul style="list-style-type: none"> • % total energy consumption
Proportion of fish in local market from mariculture	<ul style="list-style-type: none"> • % fish consumed
Number of yachts/cruise ships visiting	<ul style="list-style-type: none"> • Port call statistics
Marine data / knowledge	<ul style="list-style-type: none"> • % EEZ surveys • Confidence level for data
Conservation targets	<ul style="list-style-type: none"> • % cover of MPAs • % protection for critical habitats • Monitoring and enforcement records

APPENDIX

ADDITIONAL BACKGROUND MATERIAL

1. Characteristic of the Blue Economy

Whilst no universally agreed definition exists for the Blue Economy, it is possible to describe what the Blue Economy may look like by the prominence of certain characteristics. A review of approaches to the Green Economy highlights six strongly inter-linked characteristics that would be prominent in a Blue Economy:

Characteristic 1: Recognises the value of and invests in natural blue capital

The approach to biodiversity in the ocean is transformed from one seen to be based around habitats and species to one based around 'blue capital', where biodiversity and other ocean goods and services have multiple values and can act as natural solutions to wider challenges.

Achieves protection and recovery of ocean ecosystems and biodiversity

The overall quality of the marine environment is conserved or enhanced through protection, maintenance or restoration of natural and physical features, habitats, processes and biological diversity and the ecologically sustainable use of marine resources.

Recognises the true values of marine environment goods and services

Some values like the financial worth of sectors such as oil, gas, fisheries and tourism are easier to calculate, whilst indirect values from a sustainable supply of food, social values and aesthetic values are more difficult to quantify. Under a Blue Economy scenario the full range of marine ecosystem goods and services are recognised and quantified using expert analysis and accepted standards and approaches.

Characteristic 2: Maintains growth, fosters 'blue' business and promotes jobs in 'blue' sectors

Drives innovation - emphasises technology and innovation, cooperation and institutions

Innovation and technology - particularly in the areas of biotechnology and genetics and energy and resource use - will be critical to growing a sustainable Blue Economy. Under a Blue Economy scenario new and emerging technologies could help to drive sustainable growth, for example by enhancing resource productivity and reducing greenhouse gas emissions.

Promotes and supports small and medium sized enterprises and local communities

Small and medium sized enterprises are pivotal drivers of growth, wealth creation and employment. The role of small business in the Blue Economy is thus hugely important. Under a Blue Economy scenario innovative partnerships would develop to provide capacity-building and increased access to capital, as a means of incentivizing small and medium-sized enterprises and enabling them to take part in the Blue Economy.

Results in existing ocean industries 'greening' their operations to reduce environmental damage

Human activities continue to damage the marine environment through actions that may be inefficient, lacking sufficient regulatory oversight or cost effective/expedient for the operator. Under a Blue Economy scenario activities undertaken in the marine environment would cause minimal damage or harm to environmental, social and economic values. Furthermore, the true costs of environmental damage would be reflected in the operating costs of the business resulting in an economic incentive to reduce those costs (and the associated damage). Government has a key role to play by ensuring adoption and implementation of effective environmental controls and effective penalties for those that do not comply.

Characteristic 3: Promotes energy from low-carbon and renewable sources

Increasing energy supplies from renewable sources reduces the risks from rising and volatile prices for fossil fuels in addition to delivering mitigation benefits. Seychelles, as net oil importer, is challenged by rising and volatile prices for fossil fuels. Under a Blue Economy scenario, marine sources of renewable energy would make a significant contribution to the overall portfolio of clean energy initiatives in Seychelles and Seychelles would be seen as a global leader in decarbonising the economy.

Characteristic 4: Addresses resource scarcity and promotes enhanced resource efficiency through improved and enhanced natural resource management

Greater recognition of the risks of resource scarcity should result in efforts to conserve resources, promote the most efficient use and replace non-renewable with renewable resources wherever possible, as well as prompting decisive policy action to address the issue collectively and coherently.

Ensuring a better ecosystem approach to marine spatial planning

The existing approach of maximising economic returns through managing individual species of economic interest to the exclusion of broader ecosystem effects leads to resource degradation and invariably decline of the target species. Under a Blue Economy scenario critical ecosystem linkages and interdependences would be understood ensuring a sustained flow of marine goods and services. The focus would be shifted from single species management to one where single species issues are viewed within the context of values, challenges and issues of the broader ecosystems involved. This would include actions to avoid by-catch or, where this is not possible, to fully utilise by-catch and other waste streams to create value streams.

Shifting away from financial incentives that reward poor unsustainable practices

According to a report by UNEP, the present value of benefits from greening the fishing sector is estimated to be 3 to 5 times the value of the investment. The alternative business as usual scenario is continued decline and contraction of the fishery sector, resulting from increased scarcity and collapse of stocks. Under a Blue Economy scenario financial circumstances that act as barriers to progress would be removed, the financial value of natural blue capital would be recognised and the money released reinvested in new areas that achieve greater long-term growth and deliver multiple benefits on social, economic and environmental perspectives.

Characteristic 5: Ensures resilience from foreseeable impacts of climate change through developing adaptive capacities

A particularly important aspect of adaptation is resilience: the ability to cope with climate change and natural disasters, in particular those associated with, sea-level rise, increased temperatures and extreme weather events. Under a Blue Economy scenario the increasing risk of climate change would be recognised and managed through the incorporation of appropriate adaptation and resilience-building strategies into sustainable development, conservation and governance actions. Such actions would recognise the vital role coastal habitats play in the protection of coastal communities and infrastructure in coastal planning and decision making.

Characteristic 6: Grows the human capital to act

A skilled and experienced workforce that adapts to changing requirements and new opportunities is essential for developing Seychelles Blue Economy and attracting investment. Identifying future skills needs and adapting and developing existing education, vocational and professional training programmes to meet these needs will be critical to achieving the Vision and Goals. Raising public awareness and knowledge of the marine environment is equally important in this respect.

Builds a skilled and experienced workforce

The development of the Blue Economy will depend on the availability of relevant skills sets and technical capacity to support the growth of specific sectors and to drive innovation and R&D. While initially such capacity may be provided by ex-patriots, supporting the Blue Economy will require policies that support the transfer of knowledge at the local level and creates an investment environment that supports the growth of local enterprises. Through such initiatives, the local capacity will grow organically as demand increases.

Develops Seychelles marine research capability

Indigenous marine research in Seychelles is not well developed. The result is a chronic gap in the technical capacity for marine research, planning and decision making. Under a Blue Economy scenario, the Government and stakeholders would facilitate and support research to increase understanding of the marine environment, its natural processes and cultural marine heritage, and implement a clear marine research strategy that supports investment for new and emerging opportunities.

Facilitates stakeholder participation and cooperation

Community and stakeholder participation is a key to promoting and instituting a duty of care for the marine environment. A more inclusive form of stakeholder engagement that adopts a broader partnership approach whereby stakeholders are involved throughout the process with transparency and accountability between all parties, is required. Partnerships between government, the private sector and civil society must be built in order to ensure co-responsibility for coastal management and to empower stakeholders to participate effectively.

2. The Importance of Marine Economic Activities

The key economic activities that are relevant to the Seychelles Blue Economy are outlined briefly below. In selecting these activities, this report has focussed on the most significant activities today, those which have witnessed strong growth and those which it is considered have most potential for the future.

Function 1: Ports and shipping

This function concerns the transport of goods by sea and the associated services.

Shipping (Mature)

- International shipping and associated infrastructure is vital to the economy of Seychelles with over 95% of imports to Seychelles arriving by sea.
- In 2012, a total of 936 vessels visited Port Victoria and associated marinas. These included merchant vessels, fishing, private yachts, cruise ships, research and dredging vessels.
- Increase in tourism developments on the outer islands has also led to a threefold increase in inter-island boat transport between Mahé, Praslin and La Digue.

Ports (Mature)

- Port Victoria provides a variety of commercial facilities including container handling, bunkering, cargo discharge, handling and stevedoring, warehousing, a commercial slip and the inter-island terminal and quays.
- Fishing is also a large component of port activity, as it generates demand for processing and trans-shipment facilities, as well as fuel supplies and associated commodities.

Function 2: Food, nutrition and health

This function concerns the capacity of the marine environment to supply resources for direct consumption or for processing into food products or other consumer products. Historically, the fishing industry has been at the forefront of this function.

Fishing (Mature/Growth)

- The fishing sector is critically important for both the generation of national income from fish and fish products, revenue from fishing activities and food security. Of the gross total current account receipts of SR 15.961 billion the fisheries sector accounted for 31.5% in 2012.
- Fishing and related sectors are estimated to employ between 5,000-6,000 people - approximately 10% of the total formal work force.
- Seychelles is the major landing and transshipment point for most of the catch in the western Indian Ocean. Today the Seychelles-based purse seiner fleet contributes one third of the Indian Ocean tuna catch and two thirds of the tuna caught by purse-seiners in the Western Indian Ocean (WIO).
- Seychelles houses one of the world's largest tuna canning factories that is also the largest single exporter in Seychelles with over 90% of total national exports. There is significant

scope to increase the value created from fish processing and the production of fish based products.

Aquaculture (Growth)

- Worldwide demand for fish is expected to surge in the coming years. Much of the must come from aquaculture, with much of that production capacity occurring in the ocean.
- Although there has been mariculture activity in Seychelles since the late 1980s there is currently no mariculture activity in Seychelles (except some limited black pearl production).
- Seychelles is committed to the development of a sustainable mariculture industry and has laid out the necessary planning and legal framework to make this happen. This, in conjunction with new aquaculture standards will be the primary instruments to ensure that the mariculture industry sits within the aspirations for the development of the Blue Economy.

Biotechnology (Pre-development)

- The global market for marine biotechnology products and processes has been estimated at 2.8 billion Euro with annual growth rate of 5-10%.
- Marine biotechnology covers a wide range of activities, which can include everything from bioprocessing of harvested materials and waste products (e.g. tuna processing waste) to cultivation of microalgae in controlled conditions.
- The drivers that stimulate interest in blue biotechnology and influence the goals of bioprospecting projects are directly comparable with those that affect economies world-wide, namely:
 - Food security and water availability
 - Energy security
 - Transport fuels
 - An ageing population in developed countries
 - Increased affluence and aspirations in developing economies
 - Increasing carbon dioxide levels and climate change.

Function 3: Energy and raw materials

This function covers the exploration and production of energy and of raw materials on and from the seas.

Petroleum (Growth)

- Studies suggest that the Seychelles province may contain technically recoverable petroleum reserves of up to 2,394 million barrels of oil and 20,376 billion cubic feet of gas.
- Several petroleum companies are currently active in the Seychelles with a view to potentially drilling exploration wells in the near future.

Marine renewable energy (Pre-development)

- Possibilities for marine renewable energy development do exist in Seychelles, in relation to offshore wind wave and possibly in the future, ocean thermal energy conversion (OTEC).

- Offshore wind presents probably the most immediately realistic option and could advance rapidly building on the work undertaken to support the Mahé onshore wind farm development.

Marine minerals (Pre-development)

- While no deep sea mining activities occur on the continental shelf, analysis of data from the ISA suggests the presence of cobalt rich crust deposits within the Seychelles' continental shelf. Furthermore, Seychelles, as a Contracting Party to the United Nations Convention on the Law of the Sea, could sponsor DSM activities in The Area.
- Historically the coastal area has been an important source of aggregates for construction, with sand, gravel and coral rubble being extracted. Today, however, coastal aggregates mining is limited with small amounts of sand extracted. Aggregates are still extracted for major capital infrastructure projects but this is done on a case-by-case basis and is subject to strict regulation.

Function 4: Tourism and leisure (Mature)

This function covers those aspects of tourism and leisure that are directly supported by the ocean and the services it provides. The tourism component is of particular importance and covers economic activities related to coastal tourism.

- Tourism and tourism-related construction and manufacturing is estimated to produce more than 55% of the total GDP and contributes approximately 70% of total foreign exchange earnings.
- In 2012, over 208,000 tourists visited the islands spending SCR 3 billion in aggregate in that year
- Tourism is a major generator of employment with over 1,000 Seychellois tourism operators and over 8,000 Seychellois workers directly depend on tourism.
- The quality of Seychelles' marine environment is one of the major attractions for tourists, with key activities including yacht cruising, scuba diving and sport fishing.
- Yachting activities attract about 15% of visitor arrivals in Seychelles and this is therefore a small but not insignificant sector.
- The Outer Islands are increasingly seen as a premier salt water fly fishing destination, with bonefish being a particular attraction.

Function 5: Habitats, marine ecosystem services, and climate adaptation

Habitats and the marine ecosystem services they support are different from other sectors as this is not an economic function in itself, but rather a *conditio sine qua non* for the use of the ocean and coastal areas and for allowing other functions to flourish. The economic relevance of marine ecosystem services is substantial, and efforts in research and technological development must be made better understand their true value and their contribution to the Blue Economy.

Marine ecosystem services (Growth/Pre-development)

- The concept of ecosystem services provides a framework to recognise the many benefits of nature - by maintaining stocks of this natural capital we can allow the sustained provision of flows of ecosystem services, and thereby ensure future human well-being. Some, such as provisioning services can be valued in financial terms, whilst other non-use values are often influential in decision-making but are rarely valued in monetary terms.
- At the same time, marine bio-resources also provide a number of important ecosystem services for the planet and its inhabitants which must be maintained.
- Certain marine ecosystems provide both natural protection from climate related natural hazards and mitigation of the effects of increased atmospheric CO2 levels through the storage of CO2 (so called blue carbon ecosystems). The true value of such ecosystems is yet to be fully appreciated in most countries.

Marine habitats and conservation (Growth)

- Over the last 20 years considerable funding has been allocated to the National Parks, in particular those encompassing or entirely protecting marine areas.
- Recently the Government has made bold new commitments to expand the area under protection. In 2010, it pledged to declare 30% of Seychelles' marine area as protected, half of which will be declared as no-take zones, on the condition that they could raise USD 2.5 million a year for a conservation and adaptation fund.

Function 6: Maritime monitoring and surveillance

This function concerns the monitoring and surveillance of activities taking place at sea, as well as the monitoring of the environmental state and development of the seas and coastal areas in which these activities take place.

Maritime surveillance (Growth)

- International awareness for security on the high seas has risen, for example through coordinated actions against piracy.
- The SCG undertakes regular surveillance and monitoring patrols of the EEZ (primarily piracy).
- Inshore fisheries surveillance and monitoring is largely carried out by SFA, which are usually shore based enforcement. Indications are that the level of monitoring effort is low in this regard.
- There is a need to improve the procedures for monitoring and enforcement and clearly defining the institutional and organizational responsibilities for the management of marine activities and resources between the various ministries and departments.
- Rapid development in remote sensing technology could provide Seychelles with access to large scale surveillance platforms at relatively low cost in the future.

Environmental monitoring

Whereas maritime surveillance is mostly focused on human related activities, environmental monitoring addresses the physical, biological, chemical etc. state of the seas and oceans. This is an increasingly important area in relation to marine observation, management of marine resources marine research and climate change issues.

The concept of value chains

The core activities for each maritime function or economic activity will be surrounded by both upstream and downstream activities (the **value chain**). Upstream are suppliers of equipment, services and resources. Downstream are processing sectors and subsequent distribution and sales.

Therefore, while the existing tuna fishery itself may be a mature stage activity, opportunities exist to extend the value chain with both growth stage (fish processing) and pre-development stage activities (bio-technology). This is important since large parts of the Blue Economy will not take place in the core sectors themselves but in the broader value chain. The extent to which the value chain can be extended will determine total value that can be realised from a single maritime function or resource.

3. The Concept of Scenarios

One of the most effective ways to explore possible future development options is in the form of a relatively small number of contrasting “scenarios. Scenarios are imagined “futures”, which create representations of alternative worlds and can offer an inclusive and systematic way of thinking about what the future might look like. Scenarios describe the relevant world as it might be, far enough ahead to be beyond the scope of trend extrapolation. Each may concentrate on a different driver of change (eg sustainable development) or a different area of influence (eg fisheries or port development).

Most future scenario planning exercises for the marine environment have focussed on how largely existential factors will affect the marine environment and marine economic sectors, allowing scenarios to be built around how drivers might shape the marine environment in the future. The resulting scenarios are therefore based on largely existential factors, which means they are outside the direct control of government interventions.

Most examples of this approach utilise the “four quadrant” approach, whereby the future “possibility-space” is divided, based on two axis or dimensions. Many existing scenario exercises seem to have chosen similar criteria to define their possibility-space, with an axis representing “local to global” and an axis representing “societal/economic intervention” (Figure 1). However, for the purposes of this exercise, given the time constraints and the specific purpose of the meeting, it was decided to take a slightly different approach to developing future scenarios (or visions) for Seychelles.

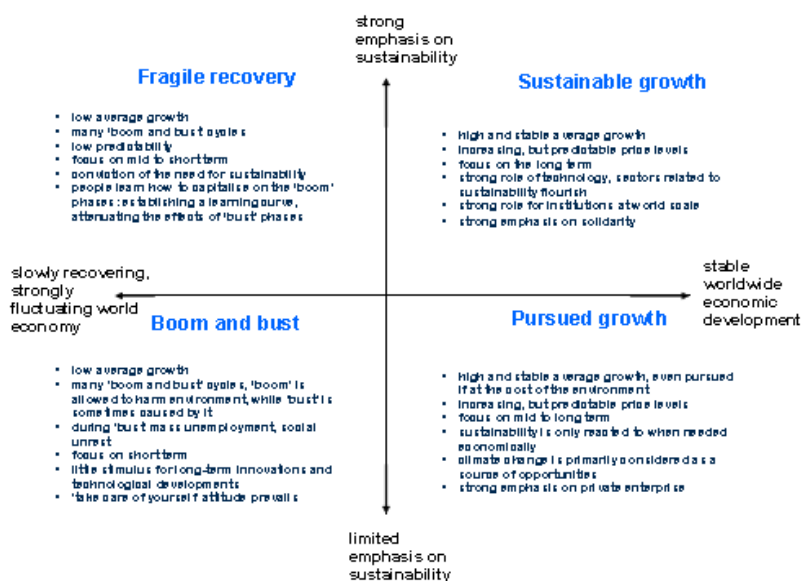


Figure 1: Example of a four quadrant matrix from the EU Blue Growth Study

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