African Union

PULA

Permanent Mission of Norway to the African Union

NATIONAL BLUE ECONOMY STRATEGY FOR BOTSWANA

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AAAS	American Association for the Advancement of Science
ABES	African Blue Economy Strategy
AfDB	African Development Bank
AMV	The African Mining Vision
AU	African Union
AU-IBAR	African Union- Inter-African Bureau for Animal Resources
BDC	Botswana Development Corporation
BDIH	Botswana Digital & Innovation Hub
BoBES	Botswana Blue Economy Strategy
CAADP	Comprehensive African Agriculture Development Programme
CAMFA	First Conference of African Ministers of Fisheries & Aquaculture
CBD	Convention on Biological Diversity
CBM	Coal-Bed Methane
CCRF	Code of Conduct for Responsible Fisheries
CEDA	Citizen Entrepreneurial Development Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DWACAR	
EU	European Union
FANR	Food, Agriculture and Natural Resources
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoB	Government of Botswana
IMF	International Monetary Fund
IRP	Integrated Resource Plan
LIMCOM	Limpopo Watercourses Commission
MDAs	Ministries, Departments & Agencies
MET	Ministry of Environment and Tourism
MME	Ministry of Minerals and Energy
MoL&A	Ministry of Lands and Agriculture
MPWT	Ministry of Public works and Transport
MT	Metric Tonnes
NDB	National Development Bank
NDP	National Development Plans
NSAs	Non-state Actors
OKACOM	Okavango River Basin Water Commission
ORASECOM	Orange-Senqu River Commission
PFRS	African Union Policy Framework & Reform Strategy for Fisheries & Aquaculture in Africa
POs	Producer Organisations
RAP	Regional Agricultural Policy
RASAP	SADC Regional Aquaculture Strategy and Action Plan
RIDMP	Regional Infrastructure Development Master Plan
RISDP	Regional Indicative Strategic Development Plan
SADC	Southern African Development Community
SDGs	Sustainable Development Goals

SEBE	Directorate of Sustainable Environment and Blue Economy of the African Union Commission
SNRL	Strengthening National-Regional Linkages
UN	United Nation
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNLOS	United Nations Convention on the Law of the Sea
USAID	United States Agency for International Development
VNRs	Voluntary National Reviews
WAVES	Wealth Accounting and the Valuation of Ecosystem Services
WRC	Water Resource Consultants
YWVG	Youth, Women, the Vulnerable Groups
ZAMCOM	Zambezi Watercourse Commission

Preface

The National Blue Economy Strategy of Botswana has been developed to address challenges constraining the performance of Botswana's traditional land-based economic development activities. Botswana Vision 2036 recognises that water is a scarce resource in Botswana and places the country on a path to pursue and promote integrated water resource management strategies, including policy instruments and public education that encourage water efficiency and conservation efforts. Therefore, this Blue Economy Strategy is going to guide the sustainable and equitable economic development that is driven by water, or the Blue Domain. Furthermore, the Blue Economy Strategy is aligned to global, continental and regional policy frameworks such as the United Nations' Sustainable Development Goals (SDGs), the African Union's Agenda 2063, the African Blue Economy Strategy and the Southern African Development Community's (SADC) Blue Economy Strategy.

Effective implementation of this Strategy will depend on effective inter-sectoral coordination. Therefore, the Government of Botswana has put in place a governance structure comprising all Blue Value Chain Stakeholders, including Government Ministries, Departments and Agencies (MDAs), Rive Basin Authorities, development partners, Non-state Actors (NSAs), Producer Organisations (POs), the academia, research institutions and the private sector. Over its period of its implementation, the Botswana Blue Economy Strategy (BoBES) will guide the design of sub-sector strategies, as well as the actions of the Blue Economy Stakeholders, to ensure coherence with our aspirations to achieve Blue Transformation.

The Strategy calls for hard work and by both the Government and all Blue Value Chain Actors. Therefore, let us all come together and make implementation of this Strategy a success for the benefit of the present and future generations of Batswana.

Hon. Dr. Micus Chimbombi, MP.

Minister of Lands and Agriculture of the Republic of Botswana.

Acknowledgement

On behalf of the Ministry of Agriculture of the Republic of Botswana, and on my own behalf, I wish to express our gratitude to all individuals and organisations who contributed to the gathering of data and information that informed preparation of this National Blue Economy Strategy.

Contributions were made throughout the extensive consultative process involving Ministry of Local Govt. & Rural Development, Ministry of Environment & Tourism, Botswana University of Agriculture and Natural Resources, Botswana International University of Science & Technology, University of Botswana, National Agricultural Research & Development Institute, Ministry of Entrepreneurship, Botswana Fish Farmers Association, AWFISHNET Botswana, Southern African Development Community **(**SADC), Directorate of Sustainable Environment and Blue Economy (SEBE) of the African Union Commission and OKACOM Secretariat.

In particular, the Ministry acknowledges the technical and financial support that was provided to us by the African Union- Inter-African Bureau for Animal Resources (AU-IBAR) and the Kingdom of Norway. This support enabled us to organise the stakeholder consultations, who instrumental in informing the formulation of this Strategy.

Lastly but not least, Dr. Sloans Chimatiro and Mr. Tayamika Chimatiro of Tayali Analytics deserve a special mention for leading all the technical process of developing this Blue Economy Strategy. The consultants worked with the Ministry of Agriculture's Task Team and the Technical Experts at AU-IBAR, who provided technical guidance to the development of this important framework.

Mr. MD Ghulam Kibria

Deputy Permanent Secretary Aquaculture and Apiculture

Ministry of Lands and Agriculture.

Republic of Botswana

1.0 Introduction

Blue economy is the sustainable and equitable economic development that is driven by water, where the natural resources in the Blue Domain (surface and ground waters) and economic activities linked to the Blue Domain, are harnessed in order to sustain food systems, livelihoods and economic activities. Therefore, building on a number of national, regional, continental and global strategies, the Republic of Botswana can exploit the country's endowment of aquatic resources to exploit the blue economy growth potential to generate wealth. Formulation of an integrated and coordinated Botswana Blue Economy Strategy (BoBES) provides a common platform for enhancing the benefits of other National Development Frameworks (e.g. agriculture, minerals, water, fisheries, transport, energy etc) through their interaction with the country's aquatic resources, such as lakes, rivers and floodplains (also referred to as Blue Domains). Additionally, the Botswana Blue Economy Strategy will herald Blue-led transformation (i.e. Blue Transformation), that will result in secure and sustainable contribution of aquatic ecosystems to economic growth, food security and nutrition. Over its period of implementation, the Botswana Blue Economy Strategy (BoBES), will guide the design of sub-sector strategies, as well as the actions of the Blue Economy Stakeholders, including the Government Ministries, Departments and Agencies (MDAs), development partners, Non-state Actors (NSAs), Producer Organisations (POs), the academia, research institutions and the private sector.

The BoBES emphasises the achievement of Blue Transformation, in coherence with the Botswana Vision 2036 and the Botswana Food Systems Transformation Pathways (UN 2021)[1]. Transformation is the central pillar of the Botswana Vision 2036 and aims for Botswana to actively seek to find innovative and breakthrough "game changers" to propel the country to a high-income status nation (GoB 2016)[2]. Therefore, this BoBES will facilitate the process of harnessing this transformation. It will promote a holistic and adaptive ecosystem approach, in order to secure socially, environmentally and economically sustainable blue value chains that will enable the country to achieve sustainable livelihoods, wealth creation, foster equitable distribution of benefits from the Blue Economy and support adequate use and conservation of biodiversity and aquatic ecosystems.

The BoBES pays particular attention to broad-based equal participation of the youth, women, the vulnerable groups (YWVG) in the Blue Economy sector. The strategy recognises that gender equality is critical for the attainment of the objective of the Vision 2036 and the United Nations' Sustainable Development Goals (SDGs), both of which emphasise the need for not leaving anyone behind. Over course of its implementation, BoBES will recognise gendered barriers that limit the capacity of women and youth to generate incomes and build assets from the Blue Economy. Therefore, in line with the Visions 2036, BoBES has outlined strategies to ensure the inclusiveness of the interventions in the country's Blue Economy.

[1] UN. 2021. Botswana Food Systems Transformation Pathway. 10th September 2021. UN Food Systems Coordination Hub.

[2] GoB. 2016. Vision 2036 – Achieving Prosperity for All by the Vision 2036. Presidential Task Team, July 2016. Government of Botswana.

2.0 Background

2.1 Physical Features of Botswana

Botswana lies between longitudes 20 and 30 degrees east of Greenwich and between the latitudes 18° and 27° approximately south of the Equator. The country is bordered by Zambia and Zimbabwe to the northeast, Namibia to the north and west, and South Africa to the south and southeast. Botswana is a Southern African country covering an area of 581,730 sq. km (Botswana Tourism 2024)[3] (Table 1). The country sits on a flat southern African plateau. The Kalahari Desert blankets the country to the centre and southwest while in the north, the Okavango Delta provides a thriving oasis, with numerous salt lakes. The Makgadikgadi Pan is located in the middle of the dry savanna and additional landforms include savanna grasslands in the east and a dry scrub along the western border with Namibia. Significant rivers as marked on the map include the Limpopo, Okavango, and Shashe with the Molopo River creating a geographical border between South Africa and Botswana. Botswana's highest point is Tsodilo Hills at 1,489 m; the lowest point is a junction of the Limpopo and Shashe Rivers at 513 m.

Table 1. Botswana Key Facts

Capital city	Gaborone
Total area	581,730.00 km^2
Land area	566,730.00 km^2
Water area	15,000.00 km^2
Population	2,346,179 (2022)[4]
	$18.34 Billion
GDP	US$5.3 billion (2023)[5]
GDP Per Capita	$7,239 (2021)[6]

Source: World Atlas (2023)

2.2 Context of Botswana Blue Economy Strategy

Water is a scarce resource in Botswana, and it is envisaged that the situation will worsen in the future (GoB 2016)[7]. In this regard, the Botswana Vision 2036 pledges that the country "will pursue and promote integrated water resource management strategies, including policy

[3] Botswana Tourism. 2024. Botswana – Location. Botswana Tourism Organisation. https://www.botswanatourism.co.bw/location#:~:text=The%20country%20lies%20between%20longitudes,to%20the%20south%20and%20southeast.

[4] Statistics Botswana. 2022. 2022 Population Census. 13th May 2022.

[5] Statistics Botswana. 2023. Gross Domestic Product (GDP): First Quarter of 2023, June 2023.

[6] IMF. 2023. IMF Executive Board Concludes 2023 Article IV Consultation with Botswana. August 31, 2023. IMF Communications Department.

[7] GoB. 2016. Vision 2036 – Achieving Prosperity for All by the Vision 2036. Presidential Task Team, July 2016. Government of Botswana.

instruments and public education that encourage water efficiency and conservation efforts, conjunctive use of surface and groundwater, and promotion of artificial recharge for groundwater" (GoB 2016).

Water resources in Botswana are in form of surface (rivers, floodplains, reservoirs /dams) and groundwater. The surface water resources consist of seven (7) reservoirs created by major dams, rivers and the wetlands of the Okavango Delta; and the groundwater includes aquifers, some of which are transboundary (GoB 2019)[8]. Although the surface water resources for Botswana is fairly low 642km^2 or 0.11% of the total country surface area, the country has substantial renewable water resources (12.2 Billion m^3/year) (FAO 2020)[9]. It is estimated that the country's groundwater resources are approximately around 100 billion m³ (GoB 2019). Various studies have estimated recharge rates with markedly different estimates. For instance, Department of Water Affairs (2013) estimates recharge at approximately 96 million m^3 year^{-1} while Department of Surveys and Mapping (2001)[10] estimated it at an average of 1600 million m³ year^{-1}.

The water resources of the large permanent rivers of the Limpopo, Chobe-Linyanti-Kwando system, the Okavango Delta as well as a small portion of Zambezi are a source of fish (GoB 2019). These water systems have an estimated total of 99 fish species that are exploited for food and nutrition security (Lars Ramberg1 et al 2006)[11]. In 2020, Botswana produced 1584 MT from capture fisheries and 146MT from aquaculture (FAO FISHSTAT 2024). The extent to which Botswana's fisheries and aquaculture systems are able to operate on a sustainable basis, and producing social and economic benefits, is directly linked to (i) the policy, (ii) regulatory, and (iii) institutional arrangements that govern the sector. Since currently Botswana does not have a national fisheries and aquaculture policy, the Blue Economy Strategy will provide some guidance.

Since Botswana shares major transboundary rivers (Limpopo, Zambezi, Linyanti, Kwando, Orange-Senqu) with other countries, it is essential that that National Blue Economy Strategy is cognisance of other countries' needs. In this regard, the Botswana Water Policy (GoB 2012)[12] states that the ministry responsible for water resources "may, when appropriate and so enabled, also administer the water law and other related legislations, and liaises with riparian users of national and international rivers regarding saving, conserving and protecting water resources". These shared river systems as well as other national rivers such as Okavango Delta are navigable and serve as means of transport. Therefore, it is essential that the Government of Botswana puts in place a Blue Economy Strategy through which the rivers will complement the country's transportation policies and strategies.

[8] GoB. 2019. Botswana's Third National Communication to the United Nations Framework Convention on Climate Change, October 2019. Ministry of Environment, Natural Resources Conservation and Tourism.
[9] FAO. 2020. FAO AQUASTAT main country database.
[10] Government of Botswana, "Botswana National Atlas," Department of Surveys and Mapping, Gaborone, 2001.
[11] Lars Ramberg, Peter Hancock, Markus Lindholm, Thoralf Meyer, Susan Ringrose, Jan Sliva, Jo Van As and Cornelis VanderPost: Species diversity of the Okavango Delta, Botswana Aquatic Sciences · 2006 DOI: 10.1007/s00027-006-0857-y.
[12] GoB. 2012. Botswana National Water Policy. Government Paper No. … of 2011, October 2012. Ministry Minerals, Energy and Water Resources.

Much of Botswana's economic growth and development has been driven by the mining sector, which contributes 25% of the country's GDP (DWACAR 2014)[13]. However, the mining sector is one of the major consumers of water in Botswana. It is estimated that the mining sector accounts for 10-15 per cent of total water use in Botswana, with the water demands estimated to rise to around 100m^3 by 2027 (WRC 2012)[14]. It is for this reason that the Government of Botswana has been urged to undertake water accounting in order to inform better management by understanding the quantity of water stocks in groundwater, reservoirs and rivers; how water is supplied and used in the economy and environment and with what result (WAVES 2015)[15]. Therefore, implementing water management interventions will ensure that the water resources, which is already under stress conditions, become less vulnerable to climate change (GoB 2019)[16].

It is under this context that the development of a National Blue Economy is urgently required in order for Botswana to coherently harness the opportunities in the diverse blue economy components. With the National Blue Economy Strategy, Blue Economy will become a significant contributor to transformation and growth the country, in line with the African Blue Economy Strategy (ABES) AU-IBAR 2019)[17] and the Botswana Vision 2036. The Botswana Vision 2036 urges for a strategic shift towards water use and allocation efficiency. Therefore, the Blue Economy Strategy will enable the country to significantly manage its scarce water resources in order to ensure availability and equitable access to water and sustainable water management. Moreover, according to the Government of Botswana, the Botswana Vision 2036 is influenced by the Africa Agenda 2063 (GoB 2016); the AU Agenda 2063's vision is for an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force on the global arena (AU 2015)[18].

2.3 The Rationale for Blue Economy in Botswana

The Blue Economy strategy will enable Botswana to achieve a more holistic and inclusive economic growth, wealth creation, improved livelihoods and descent jobs by integrating the blue economy into the national development vision (Vision 2036).

Formulation of an integrated and coordinated Boswana Blue Economy Strategy (BoBES) has been developed based on the following five major justifications:

(a) Although Botswana is a water-scares country, it has substantial water resources in the Blue Domain that can be exploited to deliver on enormous benefits in form of food, energy, transport, tourism, and other services, for the betterment of the peoples of the country.

[13] Department of Water Affairs and Centre for Applied Research (2014) Water accounting in Botswana, WAVES Technical Report.
[14] WRC (2012). Water Resources Consultants in association with ILISO (2012). Preliminary Design on the Utilisation of Water Resources of the Chobe-Zambezi River: Revised Interim Water Demand Report. Prepared for DWA-MMEWR.
[15] WAVES. 2015. Water resources and mining in Botswana. Wealth Accounting and the Valuation of Ecosystem Services (WAVES), Jan 2015. Policy Briefing Botswana.
[16] GoB. 2019. Botswana's Third National Communication to the United Nations Framework Convention on Climate Change, October 2019. Ministry of Environment, Natural Resources Conservation and Tourism.
[17]AU-IBAR, 2019. Africa Blue Economy Strategy. Nairobi, Kenya.
[18] AUC. 2015. Agenda 2063: The Africa We Want. Available at: 33126-doc-01_background_note.pdf (au.int).

(b) The options and capacity to utilise terrestrial resources could be approaching limits. Therefore, careful planning and execution of the Blue Economy projects could help Botswana build a solid foundation for sustainable development; and diversify the countries' economies beyond the existing land-based activities.

(c) Current land-based activities (e.g. mining, agriculture etc), are failing to achieve their full potential because they are planned and executed in a fragmented fashion, through individual sectoral ministries and departments. However, Blue Economy Strategy will bring coherence and better coordination for delivery, enabling Botswana to achieve the Sustainable Development Goals and deliver smart, sustainable and inclusive economic growth.

(d) Botswana shares some of its major river basins with neighbouring countries. For example, Limpopo, Okavango, Orange and other rivers are shared with two or more countries. Therefore, the country needs a shared vision with her neighbours in order for them to be to manage and develop the water and aquatic resources in these transboundary rivers. Unless effective collective actions are put in place, there is a likelihood that these shared aquatic resources will face the 'tragedy of the commons' (Hardin 1968)[19].

(e) According to The Vision 2036, water is critical for Botswana and needs inter-sectoral cooperation and coordination. Therefore, the Vision expresses its aspiration as follows: ***"we will be a water efficient and water secure nation"***; and ***"we will pursue and promote integrated water resource management strategies ……. Conjunctive use of surface and ground water, and promotion of artificial recharge for ground water"*** (GoB 2016). In this regard, promoting cooperation and coordination on the use and management of the Botswana's water resources is key to the development of the country.

[19] Hardin, G. 1968. The Tragedy of the Commons. American Association for the Advancement of Science (AAAS). Science, 13 December 1968, vol. 162, pp. 1243-48.

3.0 Methods and process of developing the Botswana Blue Economy Strategy.

The Blue Economy Strategy was developed through four interrelated components, each of which constitutes a stage in the development of the Botswana Blue Economy Strategy, as follows:

a. **Stage 1:** a review of the African Blue Economy Strategy 2019 (ABES), its Implementation Plan and Framework for the Blue Governance Mechanism; as well as other relevant documents, including related global initiatives, instruments and best practices was done. These instruments were reviewed in order to identify possible entry points to domesticate them in the prospective BoBES.

b. **Stage 2:** a review of the various national policies and strategies that are related to Blue Growth in Botswana was done. These instruments were reviewed in order to identify possible coherence with the prospective BoBES, and hence ensure alignment and ease the process of implementation of the BoBES alongside the other national development priorities.

c. **Stage 3:** Develop the Botswana Blue Economy Strategy, taking into account issues emerging from the two stages above.

d. **Stage 4:** Stakeholder consultations were held from **26th – 28th March 2024,** through a National Stakeholders' Consultation and the Broad-Based Stakeholders Workshop, that was held in Gaborone, Botswana, from 18th to 20th November 2024, to validated the Botswana Blue Economy Strategy (BoBES). The meetings were co-organized by the African Union- Inter-African Bureau for Animal Resources (AU-IBAR) and the Government of the Republic of Botswana, in collaboration with the Kingdom of Norway and the Directorate of Sustainable Environment and Blue Economy (SEBE) of the African Union Commission. The workshops brought together a range of stakeholders in order to ensure that the Botswana Blue Economy Strategy reflects the aspirations of all the major Blue Economy stakeholders in Botswana. During the stakeholder consultations, Blue Economy Experts made presentations on general aspects of Blue Economy, and specific elements that had implication on the BoBES. Stakeholders were given opportunities to make inputs to the draft BoBES through Group Discussions. Through plenary deliberations, the stakeholders built consensus around key components, goal, strategic objectives as well as the Governance Mechanism of the BoBES. The reports of the workshops are attached as Annexes 1 and 2.

4.0 Alignment with national, regional, continental and international policies and legislative frameworks and well as literature linked to Blue Economy or Growth.

Coherence of the Blue Economy or Growth to the national development in Botswana is paramount. Therefore, the Consultant will review global, continental, regional and national legislative frameworks in order to assess their alignment to the principles of Blue Economy. This is in line with the purpose of Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS), that is "to elaborate and make explicit essential guiding principles for good governance of Africa's fisheries for increased coherence and coordination of the sector in order to enhance the role of fish in food security, poverty alleviation and trade development" (AUC-NEPAD 2014)[20]. Therefore, the BoBES is coherent with global, continental, regional and broader national policy and institutional instruments. At the global level, it is aligned to the following instruments:

4.1 Global instruments.

The following global legislative frameworks will be reviewed:

1982 United Nations Convention on the Law Of the Sea (UNLOS): in addition to setting out the legal framework within which all activities in the oceans and seas must be carried out, the Convention establishes a comprehensive legal framework for marine mineral. Furthermore, the Convention makes provisions relating to marine scientific research; and grants States the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment. Although Botswana is not a coastal state, the country is a signatory to UNLOS; and most of the principles of fisheries management, "marine minerals", environmental protection, administration of shared natural resources and exploitation, apply to freshwater natural resource exploitation and sustainable use.

UN Convention on the Law of the non-navigational uses of international Watercourses (2014): also referred to as the UN International Watercourses Convention (2014), aims to guide Watercourse States in their respective territories to utilize an international watercourse in an equitable and reasonable manner. In particular, the Convention promotes the use and development of an international watercourse by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse (United Nations 1997). Botswana is party to the Convention; and how the Convention will inform some aspects of the National Blue Economy Strategy, since Botswana sits on transboundary watercourses (e.g. Zambezi, Limpopo, Orange rivers).

Sustainable Development Goals: In January 2015, the General Assembly began the negotiation process on the post-2015 development agenda. The process culminated in the subsequent adoption of the 2030 Agenda for Sustainable Development, with 17 SDGs at its

[20] AUC-NEPAD (2014). The Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa. Compiled and prepared by, in alphabetical order: Dr. Sloans Chimatiro (Head of Fisheries, NEPAD Agency); Dr. Simplice Nouala (Chief Animal Resources Officer, AU-IBAR); and Dr. Mohamed Seisay (Senior Fisheries Officer, AU-IBAR).

core, at the UN Sustainable Development Summit in September 2015 (UN 2015)[21]. Directly relevant to Botswana Blue Economy Strategy is Sustainable Development Goal 14 (on Life below Water), as it relates to prudent exploitation of the sea, preservation of the environment and prevention of pollutions and other harmful changes resulting from human activities. The Consultant will determine if Botswana is party to the SDGs and the level to which the country is committed to the SDGs and if it prepares and submits annual reports on Voluntary National Reviews (VNRs).

The **1992 Convention on Biological Diversity (CBD) (UN 1992)[22]:** the convention, while encouraging states to have sovereign right to exploit their own resources, also urge them to ensure that no damage is done to the environment of the states or areas beyond the limits of national jurisdiction. Botswana is party to the CBD. Therefore, BoBES is aligned with the Convention's three main goals, that are relevant to aquatic biodiversity, namely (i) the conservation of biological diversity (or biodiversity); (ii) the sustainable use of its components; and (iii) the fair and equitable sharing of benefits arising from genetic resources. BoBES also enables Botswana to further demonstrate its commitments to the two supplementary agreements, namely the (i) The Cartagena Protocol on Biosafety (UN 2000)[23], and (ii) Nagoya Protocol (UN 2011)[24] specifically on Access to Benefit Sharing (ABS).

Maritime and shipping international instruments relevant to fisheries– the assessment of the key marine and shipping instruments revealed that Botswana is a party to (i) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, usually known as the Basel Convention (1989)[25]; and (ii) The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (IMO 1998)[26]. These legally binding maritime and shipping instruments conventions are applicable to the inland waterways of Botswana (e.g. Limpopo, Zambezi, Linyanti, Kwando, Orange-Senqu); municipal water resources as well as fisheries and aquaculture. Therefore, the BoBES is coherent with these instruments

The FAO. Code of Conduct for Responsible Fisheries (CCRF) (FAO 1995)[27]. The Code was unanimously adopted on 31th October 1995 by the FAO Conference and provides a necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. The Code has been domesticated in the fisheries and aquaculture policies of Botswana, and therefore, the Botswana Blue Economy Strategy is coherent with the CCRF.

---

[21] United Nations. 2015. Resolution adopted by the General Assembly on 25 September 2015. Transforming our world: the 2030 Agenda for Sustainable Development. General Assembly. Distr.: General 21 October 2015.
[22] UN. 1992. Convention on Biological Diversity (CBD). United Nations.
[23] UN 2000. Cartagena Protocol on Biosafety to the Convention on Biological Diversity: text and annexes. Montreal: Secretariat of the Convention on Biological Diversity.
[24] UN 2011. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity ('Nagoya Protocol'). Secretariat of the Convention on Biological Diversity. Canada.
[25] UN. 1989. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989. Secretariat of the Basel Convention (SBC).
[26] The Secretariat of the Rotterdam Convention. 1998. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Rotterdam, 10 September 1998.
[27] FAO. 1995. Code of Conduct for Responsible Fisheries Rome, FAO. Food and Agriculture Organisation Of the United Nations 1995. 41 p.

The 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention Secretariat 1971)[28]. The Ramsar Convention provides the framework for international cooperation for the conservation of wetland habitats. Botswana is party to the Convention; and has domesticated it into the Wetlands Conservation and Management Policy (Botswana Government (2008). Since wetlands are major component of Blue Economy, and some of the wetlands in Botswana have been declared Ramsar Sites, the BoBES is in line with the Ramsar Convention. Therefore, specific strategies have been incorporated in the BoBES to ensure that the process of harnessing the Blue Economy does not lead to the loss of wetlands and their biodiversity.

The 1963 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)[29]. CITES aims to ensure that international trade in specimens of wild animals (including fish) and plants does not threaten their survival. Botswana is party to the CITES and domesticate it in the **Wildlife Policy (2013).** Therefore, the Botswana Blue Economy Strategy is in line with the CITES.

4.2 Coherence with the Continental Frameworks.

The BoBES is coherent to the following major continental instruments:

African Union's Agenda 2063 (African Union 2015)[30]**:** the Agenda 2063 is intended to guide socio-economic transformation of the continent to 2063. The Agenda 2063's Blue and Ocean Economy Goal 6, aims for accelerated economic growth especially for the priority areas of Marine Resources and Energy, and Ports Operations and Marine Transport. Therefore, the BoBES is in line with the Agenda 2063.

African Blue Economy Strategy (ABES) (AU-IBAR 2019)[31]**:** this strategy aims to guide the development of an inclusive and sustainable Blue Economy that becomes a significant contributor to continental transformation and growth. The ABES has informed the development of the BoBES, and hence, the Botswana Blue Economy Strategy it is the main framework through which Botswana delivers on the commitment to the ABES 2019.

AU-NEPAD Fish For All Summit 2005: The NEPAD-Fish for All Summit was held in Abuja in 2005 to draw global attention to the vital role of fisheries and aquaculture in meeting Africa's development agenda. The main output of the summit was the NEPAD Action Plan for the Development of African Fisheries and Aquaculture (NEPAD Action Plan) that was adopted by the Heads of State and Government. The NEPAD Action Plan emphasized the contributions by the fisheries sector to NEPAD's development objectives and CAADP. The NEPAD Action Plan further sought to strengthen the linkages between fisheries and other economic sectors in order to increase development benefits and improve sustainability. In this regard, the output of the Abuja Summit (NEPAD Plan of Action for the Development of African Fisheries and Aquaculture) has informed the Botswana Blue Economy Strategy.

---

[28] Ramsar Convention. 1971. Convention on Wetlands of International Importance especially as Waterfowl Habitat. Concluded at Ramsar, Iran, on 2 February 1971. Ramsar Convention Bureau, Gland.
[29] CITE Secretariat. 1973. Convention on International Trade in Endangered Species of Wild Fauna and Flora Signed at Washington, D.C., on 3 March 1973. CITES Secretariat, Geneva.
[30] African Union. 2015. Agenda 2063. The AFRICA We Want. Framework Document. Addis Ababa, September 2015.
[31] AU-IBAR, 2019. Africa Blue Economy Strategy. Nairobi, Kenya.

2010 First Conference of African Ministers of Fisheries & Aquaculture (CAMFA I): African Union convened the first Conference of African Ministers of Fisheries and Aquaculture (CAMFA I), in Banjul in 2010. CAMFA I made a number of observations and recommendations, including: (i) the absence of policy coherence in the sector; (ii) the need for the African Union (AU) to put in place a mechanism for broad-based participatory continental policy dialogue, fisheries management and support of Member States to strengthen policy coherence with regard to the CAADP; (iii) the need for a coordination mechanism among Regional Economic Communities (REC) and Regional Fisheries Bodies (RFB), to ensure coherence policies and initiatives of fisheries and aquaculture with the regional economic integration agenda; and (iv) the need for Member States to consider options for fisheries' reforms and strengthen institutional arrangements in order to improve the productivity of fisheries and aquaculture. Therefore, the provisions of the CAMFA I informed the Botswana Blue Economy Strategy.

African Union Policy Framework & Reform Strategy for Fisheries & Aquaculture in Africa (PFRS): this is the Common African Fisheries Policy; and has seven priorities policy arenas, namely (i) conservation and sustainable resource use; (ii) small-scale fisheries development; (iii) sustainable aquaculture development; (iv) responsible and equitable fish trade and marketing; (v) strengthen regional and sub-regional cooperation; (vi) awareness enhancing and human capacity development; and (vii) high seas fisheries. The overall purpose of the Policy Framework and Reform Strategy for Fisheries and Aquaculture is to facilitate transformation of Africa's fisheries and aquaculture for food, livelihoods and wealth. The PFRS was endorsed by the Joint African Union Ministerial Conference on Agriculture, Rural Development, Fisheries and Aquaculture in 2014, and second Conference of African Ministers of Fisheries and Aquaculture (CAMFA II) held in Addis Ababa, Ethiopia (African Union 2014)[32]. Being the main continental framework on fisheries and aquaculture, the PFRS has informed the Botswana Blue Economy Strategy.

The Lome Maritime Security Convention & the Lome Charter (AU 2016)[33]: Article 20, provides a framework for countries to align marine time security with fisheries and aquaculture development objectives. Specifically, the Charter (i) urges countries to carry out necessary reforms for good governance in the fishery sector, and (ii) to promote continental fishing and aquaculture in order to contribute to the creation of employment in the sector, reduce food insecurity and malnutrition and promote economic diversification. BoBES is coherent to these instruments as it promotes inter-sectoral and transboundary cooperation.

Comprehensive African Agricultural Development Programme (CAADP) (NEPAD 2003)[34]: this is the continental framework aimed at helping African countries eliminate hunger and reduce poverty by raising economic growth through agriculture-led development. Through CAADP, African governments agreed to allocate at least 10% of national budgets to agriculture (including fisheries and aquaculture) and rural development, and to achieve agricultural growth rates of at least 6% per annum. Underlying these main targets are targets for reducing poverty

[32] African Union. 2014. RESOLUTIONS of the AU Joint Conference of Ministers of Agriculture, Rural Development, Fisheries and Aquaculture 01-02 May 2014, Addis Ababa, Ethiopia.
[33] African Union. 2016. African Charter on Maritime Security and Safety and Development in Africa (Lome Charter). Adopted by the Extraordinary Session of the Assembly Lomé, Togo - 15th October 2016
[34] NEPAD. 2003. Comprehensive Africa Agriculture Development Programme (CAADP). July 2003, Midrand, South Africa.

and malnutrition, for increasing productivity and farm incomes, and for improvements in the sustainability of agricultural production and use of natural resources. CAADP also supports member states to enhance resilience to climate variability through development of disaster preparedness policies and strategies and early warning response systems and social safety nets. The Botswana Blue Economy Strategy is informed by the principles of CAADP, because agriculture, in general, and sub-sectors such as fisheries and aquaculture are key components of the BoBES.

Malabo Declaration of 2014: The 23rd Session of AU Heads of State and Government met in Malabo in 2014 under the theme: "The transformation of African agriculture for common prosperity and improved livelihoods, exploiting opportunities for inclusive growth and sustainable development". The principles of Malabo Declaration inform the BoBES since the Strategy is an instrument which Botswana will use in transforming its agriculture sector within the framework of blue growth.

The African Mining Vision (AMV) (AUC 2009)[35]: the vision calls for the "Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development." AMV envisages an African mining sector that is (i) knowledge-driven, (ii) sustainable and well-governed and effectively garners and deploys resource rents, is safe, healthy, gender & ethnically inclusive, environmentally friendly and socially responsible, (iii) diversified, vibrant, globally competitive and industrialising African economy, (iv) harnessing the potential of artisanal and small-scale mining, and (v) plays a major role in a vibrant and competitive national, continental and international capital and commodity markets. Since Botswana is a mining nation, the BoBES is clearly aligned with the African Mining Vision.

4.3 Review and analyse the Regional Frameworks.

Since Boswana is in the SADC region, some key SADC legislative frameworks were reviewed, and the BoBES is aligned with the following:

SADC Treaty (SADC 2014)[36]: Article 14 of the SADC Treaty establishes the SADC Secretariat as the principal executive institution of SADC; and the Secretariat has put in place a number of policies, protocols, strategic and programme provisions that provide for the management and utilization of water, mining, environment, fisheries and aquaculture resources. Therefore, BoBES is aligned with the following SADC instruments:

(i) the **Regional Indicative Strategic Development Plan (RISDP)** (SADC 2020)[37];

(ii) the Regional Infrastructure Development Master Plan (RIDMP)[38].

[35] African Union. 2009. The African Mining Vision. February 2009. African Union Commission (AUC), Addis Ababa.
[36] SADC. 2014. A consolidated Text of the SADC Treaty. The SADC Treaty was signed at Windhoek, Namibia on 17 August 1992, entering into force on 30 September 1993. The Treaty was amended at Blantyre, Malawi in August 2001.
[37] SADC. 2020. Regional Indicative Strategic Development Plan (RISDP) 2020–2030. SADC Secretariat Gaborone, Botswana, 2020.
[38] SADC. 2012. Regional Infrastructure Development Master Plan. Executive Summary August 2012

(iii) the SADC Industrialization Strategy and the Roadmap (2015)[39].

Furthermore, the BoBES is aligned with the SADC Revised Regional Indicative Strategic Development Plan (2020-2030) and the Industrialization Strategy and Roadmap (2015-2063) both identify the blue economy as a potential area for sustainable growth in the region. The SADC Industrialization Strategy and Roadmap (2015-2063) requires that the Blue Economy Initiative be mainstreamed in developing infrastructure required to accelerate industrialization. In addition, the BoBES is aligned with the SADC Regional Infrastructure Development Master Plan (RIDMP)[40]

Additionally, the BoBES is coherent with the following SADC instruments:

(i) **SADC Revised Protocol on Shared Watercourses (SADC 2000)[41]:** The overall objective of this Protocol is to foster closer cooperation for judicious, sustainable and coordinated management, protection and utilisation of shared watercourses and advance the Southern African Development Community (SADC) agenda of regional integration and poverty alleviation. Among others, the Protocol aims to achieve the following aims (i) to promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses; (ii) to promote a coordinated and integrated environmentally sound development and management of shared watercourses; and (iii) to promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management.

(ii) **SADC Regional Agricultural Policy (RAP)[42]:** The overall objective of the Policy is to contribute to sustainable agricultural growth and socio-economic development. The Policy takes into account the prudent management of water, including shared marine space, rivers and inland lakes, as water is also essential as habitat for fishery resources. In this regard, the Policy ensures that SADC complements and supports Member States' own national actions to improve the management of water resources for agriculture. Specifically on fisheries, the Policy aims to stimulate and support Member States' efforts to improve production, processing, trade, conservation and sustainable management of forest and fisheries resources.

(iii) **SADC Protocol on Fisheries (2001)**[43]: this is the main regional policy guiding the fisheries and aquaculture; and its objective is to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems of interest to State Parties.

[39] SADC. 2015. SADC Industrialisation Strategy and Roadmap. Approved by summit in Harare, Zimbabwe, on 29th April 2015.
[40] SADC. 2012. Regional Infrastructure Development Master Plan. Executive Summary August 2012
[41] SADC. 2000. Revised Protocol on Shared Watercourses. Southern African Development Community.
[42] SADC. 2013. Regional Agricultural Policy. Food, Agriculture and Natural Resources (FANR) Directorate SADC Secretariat Private Bag 0095 Gaborone, Botswana. 7 June 2013.
[43] SADC. 2001. Protocol on Fisheries. Southern African Development Community.

(iv) **SADC Regional Aquaculture Strategy and Action Plan (RASAP) (2016 – 2026)**[44]: The RASAP aims to provide strategic direction for the rapid, environmentally responsible, development of aquaculture in SADC Member States, while simultaneously safeguarding the ecological integrity of aquatic ecosystems, conserving common genetic resources and supporting the maintenance of regional aquatic biosecurity.

(v) **SADC Food and Nutrition Security Strategy (2015-2025)**[45]: clearly outlines strategies aimed at "Significantly reduce food and nutrition insecurity in the Region by 2025", with a sub-strategies on fisheries and aquaculture.

(vi) **SADC Regional Aquatic Animal Health and Biosecurity Strategy:** aims to advance the development of cross border value chains that better enable the utilization of aquatic and human resources within the region. The BoBES takes into account the need to ensure that aquaculture development does not pose a risk to the environment and neighbouring states, due to the spread of fish diseases and parasite.

(vii) **SADC Climate Change Strategy and Action Plan (2015)**[46]: aims to provide a broad outline for harmonized and coordinated Regional and National actions to address and respond to the impacts of climate change. Botswana is a generally prone to climate risks.

(viii) **Blue Economy in the SADC Region**. This will form the foundation of the Botswana Blue Economy Strategy. All Member States of SADC are expected to ascribe to the regional blue economy strategy.

(ix) **Regional Water Strategy (SADC 2015)**[47]. Due to the fact Blue Economy operates within the blue (or water) domain, therefore, the Botswana Blue Economy Strategy is coherent with the SADC Water Strategy.

4.4 River and Lake Basins legislative frameworks.

Botswana is a party to a number of global and regional River Basin legislative frameworks. These instruments have been domesticated into the national policies and strategies and they are being implemented through some of the transboundary commitments which the country has made. Through the River Basin Organizations, Botswana will be provided with a platform to cooperated with the neighbours in the management and utilisation of transboundary surface and groundwater resources, within the framework of the Blue Economy.

Therefore, the BoBES is coherent with the following River Basin frameworks:

The Orange-Senqu River Commission (ORASECOM): Botswana is a member of the **ORASECOM,** an institution responsible for managing the water resources of the

[44] SADC. 2017. SADC Regional Aquaculture Strategy and Action Plan (2016 – 2026). SADC Secretariat. Gaborone, Botswana.
[45] SADC. 2014. Food and Nutrition Security Strategy (2015-2025). SADC Secretariat, Gaborone, Botswana.
[46] SADC. 2015. SADC Climate Change Strategy and Action Plan Version 24 July 2015.
[47] SADC. 2015. Regional Water Strategy (SADC 2015). June 2006. SADC Secretariat.

Orange-Senqu River basin. The Basin is transboundary, and the resource are shared by Botswana, Namibia, Lesotho and South Africa.

Zambezi Watercourse Commission (ZAMCOM)[48]**:** with the Secretariat based in Lusaka, Zambia, the Commission aims to promote the equitable and reasonable utilization of the water resources of the Zambezi watercourse, and their efficient management and sustainable development. Botswana is one of the eight (8) members of the ZAMCOM.

Limpopo Watercourses Commission (LIMCOM): The Limpopo Watercourse Commission was established between the Republics of Botswana, Mozambique, South Africa and Zimbabwe, through the LIMCOM Agreement signed in November 2003 in Maputo, Mozambique. Its mandate is to "advise the Contracting Parties and provide recommendations on the uses of the Limpopo, its tributaries and its waters for purposes and measures of protection, preservation and management of the Limpopo".

Permanent Okavango River Basin Water Commission (OKACOM): was established in 1994 by the 'Agreement among the Governments of the Republic of Angola, the Republic of Botswana and the Republic of Namibia. The Commission aims to assist Member States to have a better understanding of the basin's sound developments opportunities without over-stretching the limits of the "acceptable development space" (Chonguiça & April 2014)[49].

All these River Basin Management Organisations (RBMOs) have been established within the framework of the Revised SADC Protocol on Shared Watercourses (SADC 2000). Furthermore, the Revised Protocol on Shared Watercourses signifies an instrument that creates legally binding obligations at international law, as stipulated in the UN Water Conventions[50]. Considering that 80 % of Botswana's water resources are transboundary, this Protocol is critical for the RBMOs, including their responsibilities and cooperation within fisheries in the Blue Economy, as part of their integration agendas. Therefore, the BoBES has specific strategies that will enable these River Basin Authorities to be involved in the governance framework of the BoBES in order to operationalise the Botswana Blue Economy Strategy.

4.5 National legislations.

The Blue Economy Strategy is aligned with a number of national legislative frameworks that include the following:

Vision 2036 (GoB 2016): The Vision is a transformational agenda that defines Botswana's aspirations and goals; and aims to transform Botswana from an upper-middle income to a high-income country by 2036 (GoB 2016). The BoBES is aligned with the Vision 2036 because it emphasises transformation and puts water at the centre of its development and implementation.

[48] Heyns, P. 2003. Water-resources management in Southern Africa. *In:* International waters in Southern Africa. Mikiyasu Nakayama (eds). United Nations University Press, Tokyo, Japan. 5-38pp.
[49] Chonguiça, E. & T.M. April. 2014. Permanent Okavango River Basin Water Commission (OKACOM): Benefits of Transboundary Water Cooperation" "Counting our Gains" Cubango-Okavango River Basin Case Study.
[50] The 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses are collectively known as the UN Water Conventions; and both are legally binding.

The Water Act, 1968: the Act defines water use rights and pollution controls and penalties; and hence the BoBES is aligned with the Act to ensure coherence of the BoBES with the water use rights.

The National Water Policy of 2016 (GoB 2012)[51]: facilitate access to water of suitable quality and standards for the citizenry and provide the foundations for sustainable development of water resources in support of economic growth, diversification and poverty eradication. The BoBES is aligned with the policy to ensure coherence of the BoBES with the equitable access and distribution of water.

The Borehole Act, 1956: governs borehole creation and operations. The BoBES is aligned with the Borehole Act to ensure coherence of the BoBES with the principle guiding access to groundwater.

The Waterworks Act, 1962: governs the establishment of water authorities in townships and their responsibility for supplying water and waterworks (e.g. reservoirs, dams, tanks, pipes, etc.). The BoBES is aligned with the Waterworks Act to ensure coherence of the BoBES with the activities of the water authorities.

The Aquatic Weeds Control Act 1986: aims to provide for the Control of Aquatic Weeds Importation and movement of aquatic weeds prohibited, Declaration of invested waters, Regulations on import action and movement of aquatic weeds prohibited and promoting eradication of aquatic weeds and Protection from liability for acts done in good faith. Since development and control of water might result in unintended translocation of invasive aquatic weeds, the BoBES puts in place strategies to prevent movement of aquatic weeds that is detrimental to aquatic ecosystems.

Water Utilities Corporation Act (1972): aims to provide for the establishment of a Corporation to be known as the Water Utilities Corporation for the supply and distribution of water. The BoBES is aligned with the Waterworks Act to ensure coherence of the BoBES with the activities of the water authorities, including inter-catchment water transfer.

The Integrated Water Resources Management and Water Efficiency Plan (IWRM-WE) (2013): its overall goal is to improve people's livelihoods and welfare and contribute to sustained economic growth, economic diversification, social justice and poverty eradication through efficient, equitable and sustainable water resources management. The BoBES is aligned with the IWRM-WE Plan to ensure that all components of the Blue Economy are well coordinated within the framework of IWRM-WE.

The National Water Master Plan review of 2006 and NWMP Update 2018: recommends that future water resources management should be dominated by water resources stewardship and water demand management rather than capital development works. The BoBES is aligned with the Water Master Plan and its underpinning principles of stewardship and demand management, as these are relevant for a functional Blue Economy Strategy.

[51] GoB. 2012. Botswana National Water Policy. Government Paper No. … of 2011, October 2012. Ministry Minerals, Energy and Water Resources.

The Botswana climate policy (GoB 2023)[52]: aims to mainstream sustainability and climate change into development planning and in so doing, enhance Botswana's resilience and capacity to respond to existing and anticipated climate change impacts. Since climate change is one the major factors influencing Blue Domains, the BoBES is coherent with the climate policy to ensure that the BoBES is resilient to climate change.

Botswana National Climate Change Strategy (GoB 2018)[53]: aims to provide guidance on Botswana's adaptation and mitigation to climate change, whilst meeting its socio-economic development goals; including realizing the Vision 2036 and achieving the UN Sustainable Development. To ensure that BoBES is adaptable to climate change is it aligned with the Climate Strategy.

National Policy on Agricultural Development (1991, Revised 2014): aims to improve food security at both household and national levels; diversify the agricultural production base; increase agricultural output and productivity; increase employment opportunities for the fast-growing labour force; provide a secure and productive environment for agricultural producers; and conserve scarce agricultural and land resources for future generations. Since agriculture is major consumers of water, the BoBES is coherent with the Policy on Agricultural Development to ensure that water demand for agriculture does not proceed at the detriment of other water users.

Wildlife Policy (Botswana Government, 2013): aims to create an enabling environment for the wise and sustainable use of Botswana's wildlife resources for the current and future generations. The Wildlife Policy also advocates for wise use of fisheries resources in order to leverage its value for improvement of human livelihoods. The BoBES provides strategies that safeguards the use of water for wildlife, making it coherent with the wildlife policy.

Fish Protection Regulations (2016)[54]: aims to protect fish resources by prohibiting commercial fishing without a commercial fishing licence and prescribe that only a citizen of Botswana may undertake subsistence fishing. The regulations also prescribe specified gear that can be used for subsistence fishing in drying out pools on flood plains. The fish sector is one of the major components of the BoBES, therefore, the Strategy is coherent with the Fish Protection Regulations because elements of the regulations are included in the fisheries and aquaculture component of the Strategy.

Transboundary Fisheries Management Plan for the Okavango Basin (Tweddle & Hay 2013)[55]: aims to establish a joint management system to ensure the conservation and sustainable use of the shared fish resources of the Cubango-Okavango River for the benefit of local communities. The Management Plan further provides a foundation for the responsible co-management of shared fish stocks among Angola, Namibia and Botswana in the Cubango-

[52] GoB. 2023. Botswana Climate Change Response Policy. 17th December 2023. Ministry of Environment, Natural Resources Conservation and Tourism

[53] GoB. 2018. Botswana National Climate Change Strategy, 12 December 2018. Ministry of Environment, Natural Resources Conservation and Tourism.

[54] GoB. 2016. FISH PROTECTION ACT (Cap. 38:04) FISH PROTECTION REGULATIONS, 2816. Statutory Instrument No. 16 o/2016. (Published on 19th February, 2016).

[55] Tweddle, D. & C. J. Hay. 2013. Transboundary Fisheries Management Plan for the Okavango Basin. NNF/EU Community Conservation Fisheries in KAZA Project. Chemonics International, Washington, DC.

Okavango River basin. Since the Okavango is the major aquatic ecosystem in Botswana, the BoBES puts special focus on it.

Wetlands Conservation and Management Policy (Botswana Government (2008): aims to protect, conserve and rehabilitate Botswana's wetlands so as to maintain their ability to provide ecological and socio-economic functions as well as providing benefits for the present and future generations. The BoBES is aligned with the Wetlands Conservation and Management Policy because wetlands are one of the major Blue Domains in Botswana.

The Environmental Assessment Regulations (Botswana Government, 2012): the regulations list activities, locations and thresholds for which an environmental statement is required. Environmental statements are required for environmentally sensitive areas which are classified as "any development in national parks, game reserves, wildlife management areas, wetlands". Since development of the various Blue Economy sub-sectors will require careful assessment of the development's impact on the environment, the BoBES has put in place specific strategies to ensure alignment with the Environmental Assessment Regulations **(**EARs).

Aquaculture Strategy (SNRL-GIZ 2021)[56]: aims to provide scope and direction in terms of developing pertinent interventions and support measures, which will create an enabling environment for the development of an equitable, diverse, viable, competitive and sustainable aquaculture sub-sector that will in turn contribute towards livelihoods of citizens in terms of income generation, employment creation, and wealth creation - and subsequently to poverty eradication. The aquaculture sub-sector is one of the major components of the BoBES, therefore, the Strategy is coherent with the Aquaculture Strategy to ensure sustainable development aquaculture within the framework of the BoBES.

[56] SNRL/GIZ. 2021. Aquaculture Strategy. March 2021. Strengthening National-Regional Linkages (SNRL)/GUZ. Gaborone.

5.0 Key Components of the Blue Economy Strategy

5.1 Criteria for Identifying Major Components of the Blue Economy Strategy

To build a coherent Blue Economy Strategy Botswana will harness the aquatic ecosystems by pulling together existing sectoral development themes on to a common Blue Economy platform. Therefore, to identify the key sectors, that analysis of the major water-using sectors was done using the three criteria, namely:

(i) Component of the BE should be a Major Economic Sectors

Major economic sectors are those that are generating wealth for the country. Fig 1 below shows the sectors' contribution to the Gross Domestic Product (GDP). Therefore, some of the major economic sectors are mining, construction manufacturing and agriculture, including forestry and fisheries.

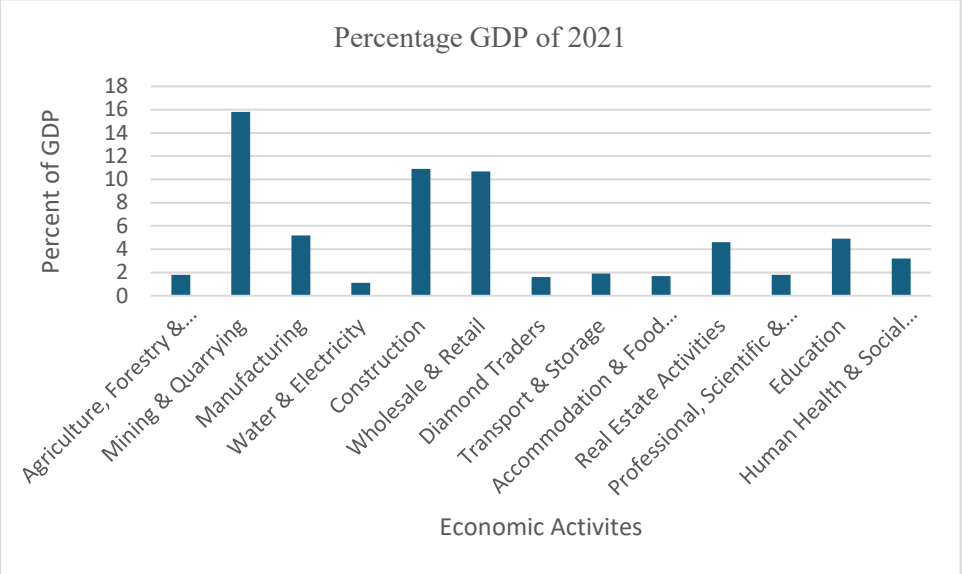

Figure 1. Compiled by the author using data from Statistics Botswana (2021)

(ii) Component of the BE should be a Water-Dependent.

Second criterion for an economic activity to qualify as a major component of the BE Strategy is that the activity should be dependent on water in order to be productivity; in other words, these are economic activities where water is a limiting factor. Assessment of the water-use of the economic activities identified the key economic activities shown in Fig. 2 below. Being a water-scare country, it is important for Botswana to strive to know whether an economic activity uses water efficiently and productively. In this regard, The Department of Water Affairs developed water accounts for 2010/11 and 2011/12 to answer these questions (WAVES 2015). The major water consuming economic sectors are agriculture, mining, government services, to mention but a few (see Fig. 2).

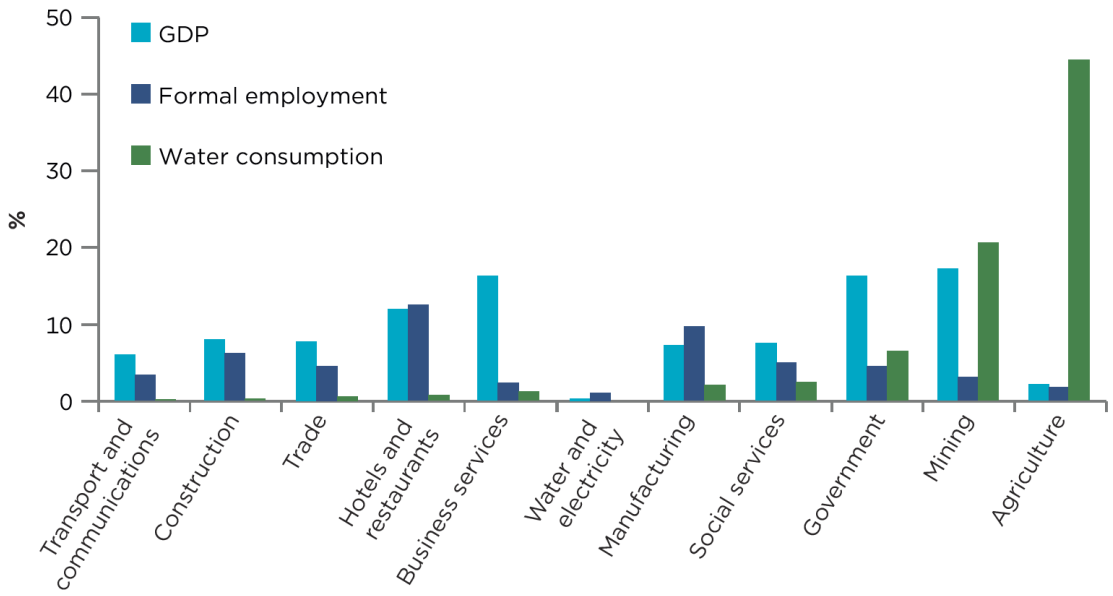

Figure 2. Sector shares in water use, GDP and formal employment 2011/20123 (WAVES Policy Briefing, Jan 2015)

(iii) Component of the BE should Require Inter-sectoral Coordination to Enhance Efficiency of Water Use

The third criterion is the need for inter-sectoral coordination in order to promote efficient use of water. Since the economic activities shown in Fig 2 depend on water for their operations, it means that the rising water demands of such economic sectors puts increasing pressure on water resources. In this regard, it is imperative for the Government fo Botswana to ensure sustainability of water use, by putting in place an inter-sectoral cooperation with water resource management institutions. Moreover, the Botswana Integrated Water Resources Management & Water Efficiency Plan (Government of Botswana 2013)[57] underscores the importance of central coordination. The IWRM&WE reported that "where there are several initiatives on going in the Basin that are closely related to central aspects of the Strategy (water), it is critical to bundle these initiatives and coordinate them under a central coordination institution. This allows a critical mass of activities in support of integrated water resources development and management, while retaining progress under different initiatives" (Government of Botswana 2013).

5.2 Categorisation of the Major Components of the Blue Economy Strategy

Key components of the Botswana Blue Economy Strategy were defined by initial review of the African Blue Economy Strategy (ABES) (2019), which has defined key components of ABES as being defined by the key themes namely (i) Fishery and aquaculture; (ii) energy, (iii) Mineral and Oil and Gas, (iv) Innovative Industries; (v) Coastal tourism, and (vi) Blue Carbon & other Ecosystem Services and Resilience. Further to this method of categorisation of BE

[57] Department of Water Affairs Ministry of Minerals, Energy & Water Resources. (2013). *Botswana Integrated Water Resources Management & Water Efficiency Plan*. (L. Dikobe, Ed.) Gaborone, Botswana: Government of Botswana.

components, the National Stakeholder Consultative Workshop that was held from 26th to 28th March 2024, identified the key components based on the:

(i) types of industries,
(ii) types of services that are provided by the components; and
(iii) the economic activities that are generated by the components (see Table 2 below).

Table 2. The Key Components of the Blue Economy in Botswana.

Industries	Sub-sector/Services	Economic activity	Drivers of growth
Harvest & production of living resources.	Aquatic food	Fisheries	Food security
			Exports
		Aquaculture	Demand for protein
			Dwindling wild capture
	Freshwater biotechnology	Pharmaceuticals, chemicals	Research & Development for healthcare & industry
Production	Agriculture	Crops	Demand for food (carbohydrates)
		Livestock	Demand for food (protein)
Extraction of non-living resources, generation of new resources	Minerals	Seabed or river/ lakebed mining	Demand for minerals
	Energy	Oil & gas	Demand for alternative energy sources
		Renewables	
	Surface water	Pipe/canals	Water Utilities Corporation
	Fossil and/or Ground water	Drilling aquifers/Boreholes	Water Utilities Corporation
Commerce and trade in & around the watercourses	Transport and trade.	Shipping	Growth in water borne trade, international regulations, deepening Botswana's efforts in regional integration
		Port infrastructure & services	
	Tourism and recreation	Tourism/recreation	Growth in Botswana regional & global tourism
		Lakeshore or riverine riparian development	• watercourse • urbanisation
			Domestic/regional regulations
Response to inland waters health challenges	Inland waters monitoring, control & surveillance	Technology, R&D and pollutions control	R&D in Blue and aquatic technologies
	Carbon sequestration	Blue carbon	Growth in shore & inland water protection & conservation activities
	Coastal & shore protection	Habitat protection & restoration	Growth in restoration of eroded/degraded inland waters (in line with Ramsar Convention)
	Waste disposal	Assimilation of nutrients & wastes	Growth in waste recycling in line with COP26's Nationally Determined Contributions (NDCs)

Source: Adapted from ECOWAS Blue Economy Strategy (ECOWAS/Chimatiro 2022); Economist Intelligence Unit 2015 and World Bank. 2016; and validated by the National Stakeholder Consultative Workshop to Define Priority Issues for Development of National Blue Economy strategy for Botswana, that was held from 26th to 28th March 2024.

6.0 Status of the Blue Economy in Botswana and Prospects for further Development

6.1 Minerals

According to Yager (2023)[58], in 2019, the mining and quarrying sector accounted for 15.2% of Botswana's gross domestic product, and the manufacturing sector, 5.2%. The value of output in the mining and quarrying sector decreased by 3.9% in 2019 after increasing by 7.6% in 2018. Formal employment in the mining and quarrying sector was reported to be 16,762 workers in 2019, which was nearly unchanged from that of 2018. As of January 2019, formal employment in the diamond cutting and polishing sector was reported to be 2,398 workers (Yager (2023). During the first quarter of 2023, Mining & Quarrying became the major contributor to GDP at 19.6 percent, followed by Public Administration & Defence at 15.5 percent, Wholesale & Retail at 11.1 percent and Construction at 10.6 percent (Statistics Botswana 2023)[59] (see Fig 3 below).

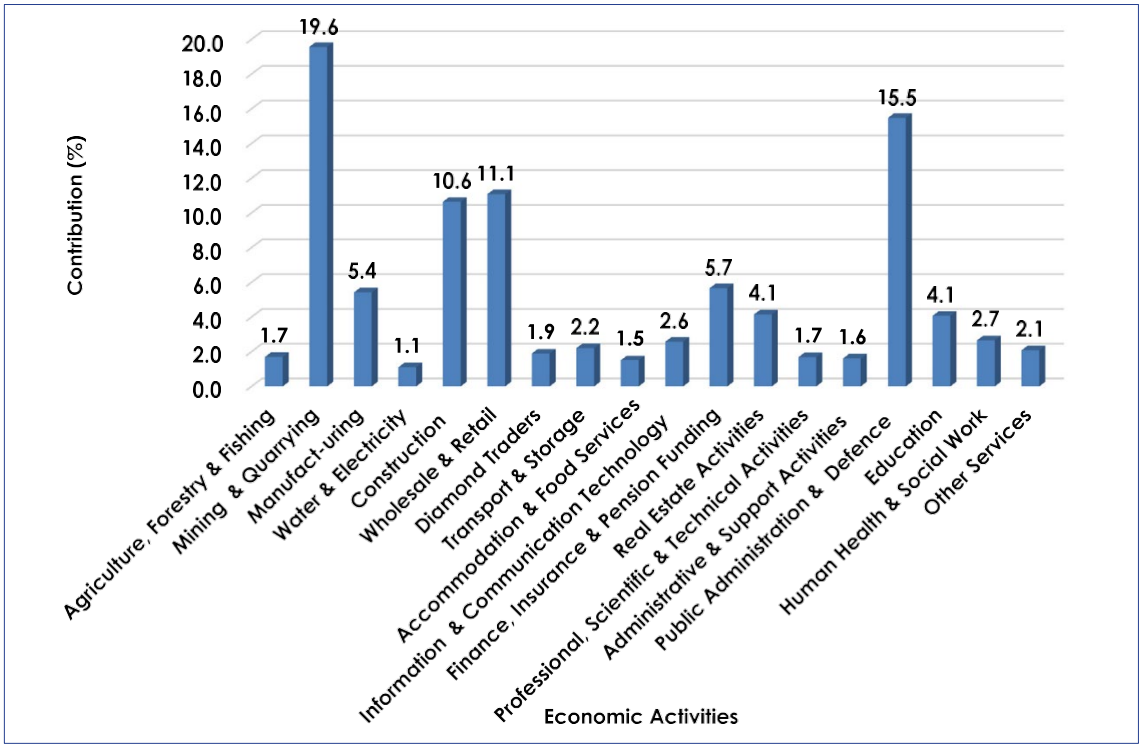

Figure 3. Contribution to GDP by Economic Activities (2023 Q1) (Statistics Botswana 2023).

In addition to diamonds, Botswana also produces cement, clay, coal, cobalt, mined and smelted copper, gemstones (such as agate), gold, mined and smelted nickel, palladium, platinum, salt, and silver (Yager 2023). While mining is the major contributor to economic growth, it is also

[58] Yager, T.R. 2023. The Mineral Industry of Botswana. November 2023. U.S. Department of the Interior U.S. Geological Survey.
[59] Statistics Botswana. 2023. Gross Domestic Product (GDP) estimates: first quarter of 2023. June 2023.

estimated that the water demands of the mining sector may grow to around 100Mm^3 in 2027 (WRC 2012)[60].

The mining sector's share in the country's water use has ranged from 10 to 17 per cent in the period 1990-2010 with an average of 13 per cent (see Figure 3). The sector's share peaked at 17 per cent in 2003 but has dropped back since then. Diamond mining accounts for just over three quarters of the sector's water use and an average of 10 per cent of the country's water use. Further to being a major user of water, there is a fear that mining may lead to water pollution through discharge of effluent or seepage from tailing dams (WAVE 2015)[61]. additionally, some of the mining sites are situated within the major water basins. Therefore, in addition to promoting water use efficiency, there is a need for monitoring of the water quality and water pollution treatment may be necessary where water pollution is or may be taking place.

6.2 Aquatic foods (Fisheries and Aquaculture)

The aquatic systems comprise the Okavango, Chobe/Linyanti, Limpopo, 7 major reservoirs under authority of Water Utilities Corporation as well as over 300 small community dams. One of the most important resources from these aquatic ecosystems are fisheries and aquaculture. Fish production in Botswana is very small (see Table 3), and as such its contribution to the national economy is considered negligible. The largest fishery resource is the Okavango Delta, which accounts for 80 percent of the catches and the remaining 20 percent comes from Gaborone Dam, Bokaa Dam, Shashe Dam and Letsibogo Dam, while the Chobe system accounts for a very small amount of national fish production. Furthermore, aquaculture is emerging as an important sub-sector.

While fish production may be considered negligible, the resources do mostly support a small percent of fish-dependent, who are considered marginalized communities, especially in Okavango and Chobe regions. Although Botswana is a predominantly meat-eating country, fish consumption is growing, with imports rising from 10 840 MT in 2016 to 11 873MT in 2018 (FAO 2018)[62]. Moreover, fish is accounting for per capita consumption of 2.9 kg in 2017 and constituting 3.0 percent of animal protein (FAO 2018)[63].

[60] WRC (2012). Water Resources Consultants in association with ILISO (2012). Preliminary Design on the Utilisation of Water Resources of the Chobe- Zambezi River: Revised Interim Water Demand Report. Prepared for DWA-MMEWR.

[61]WAVES. 2015. Water resources and mining in Botswana. Wealth Accounting and the Valuation of Ecosystem Services (WAVES), Jan 2015. Policy Briefing Botswana.

[62] FAO. 2020. *FAO Yearbook. Fishery and Aquaculture Statistics 2018.*

[63] FAO. 2020. *FAO Yearbook. Fishery and Aquaculture Statistics 2018.*

Table 3. Fisheries and aquaculture production in Botswana

Year	Aquaculture (MT)	Fisheries (MT)
2015	20	81
2016	15	38
2017	20	38
2018	25	38
2019	35	38
2020	146	33
2021	163	38

Source: FAO-FISHSTAT

According to the VNR of 2022, the Government of Botswana considers the development of fisheries and aquaculture as one of the key priorities, as fish increases to play a role in enhancing food and nutrition security, eradicating poverty, generating employment and income, improving rural livelihoods and increasing investment. Consequently, the SDG Target 14 has been included in the Voluntary National Review Report, with Target 14.4.1 (proportion of fish stocks within biologically sustainable levels) being monitored and safeguard through legislation (Fish Protection Act of 2021) (GoB & UN 2022)[64].

6.3 Agriculture

According to the National Water Master Plan agriculture accounts for 10.39% of land in Botswana (Table 4) (GoB 2018)[65]. The agricultural sector is the leading water using sector (41% of water consumption and 35% of water abstraction over the period 2010-2014, the livestock subsector accounts for around 75% agricultural water use (around 50 Mm^3). This situation is likely to change in future if plans for large scale irrigation materialise, significantly increasing the sub-sector's water use (50 to 350 Mm3) (GoB 2015)[66]. Therefore, increased water efficiency should guide any future agricultural sector expansion; and account for its water use and the achieved productivity along with other strategic development planning concerns (GoB 2015). Furthermore, livestock is one of the major users of water. Therefore, construction and maintenance of infrastructure that captures surface water needs to be encouraged. Additionally, in irrigation, water conservation potential of drip irrigation needs to be fully utilized; with the potential of treated wastewater to be used for irrigation, explored and utilized.

[64] GoB & UN. 2022. Botswana 2022 Voluntary National Review Report for Sustainable Development Goals (SDGs). Ministry of Finance in collaboration with United Nations in Botswana.

[65] GoB. 2018. Country Overview. Botswana National Water Master Plan Update based on Smart Water Management System. *In:* National Water Master Plan Update Based on Smart Water Management. Final report. February 2018. Ministry of Land Management, Water and Sanitation Services. Department of Water Affairs.

[66] GoB. 2015. Botswana's Agriculture and Water Resources. Policy Brief. May 2015. *WAVES Botswana Policy Brief 3: Agriculture & water resources in Botswana.* Department of Water Affairs & the Centre for Applied Research.

Table 4. Area and ratio by land use

Land Use									
Category	**Total**	**Agriculture**	**Forest reserve**	**Game reserve**	**Mining lease area**	**National Park**	**Others**	**Urban area**	**Wildlife management area**
Area (km^2)	581,730	60,428	4,102	62,176	408	40,860	283,986	773	128,997
Ratio (%)	100	10.39	0.71	10.69	0.07	7.02	48.82	0.13	22.17

6.4 Climate and Weather

Botswana is located in the inland area of southern Africa, with a tropical climate in the north and subtropical climate in the rest of the country. Being landlocked, the temperature difference in daytime is large, and the climate of summer and winter is remarkably different. The average annual maximum temperature of Botswana is 29.4°C and the average annual minimum temperature is about 13.9°C.

The annual rainfall is about 450mm per year, mainly raining from November to March, and varies by region. In the north, the average annual rainfall is about 650mm, and in the western Kalahari Desert it is less than 225mm. In particular, about 90% or more of annual average rainfall is concentrated in the summer from November to March and it is difficult to maintain water resources. The rainfall in Botswana increases from the southwest to the northeast. The rainfall is recorded from 300mm to 400 mm in the southwest of Botswana, 400mm to 500 mm in the middle and more than 500 mm in the northeast (NWMPR (2006). The rainfall in the southwest and eastern regions are the lowest, and the rainfall in the north region including Kasane region and the southeast region are the highest.

6.5 Blue Energy

Within the framework 11th National Development Plans (NDP 11) and other sector policies and ambitions, the Integrated Energy Planning and the Integrated Resource Plan (IRP) are integral to the energy planning process in Botswana. Energy consumption in Botswana is projected to rise from 3.477 TWh in 2016 to 7.738 TWh in 2040 (GoB 2020)[67]. Currently, in Botswana electricity is primarily generated from domestic coal resources. However, the IRP aims to ensure that generation of renewables will reduce coal contribution from the current 99% to 61% by 2040 (GoB 2020). This reduction will be achieved by maximising energy generation through (i) coal-bed methane (CBM), (ii) solar power; and (iii) wind power.

6.5.1 Solar Energy

Solar potential in Botswana is very high, with over 3,200 hours of sunshine received per year with an average insolation on a flat surface of 21 MJ/m (see Table 5 and Fig. 4 below). In 2020, the government had one solar power plant of 100 MW (2x50 MW) solar PV power plant being procured; and planned to feed into the grid by 2021; and a 35MW grid connected PV power plants. The potential for wind power is also high, with regions of the highest wind potential located in the South-West and Eastern parts of Botswana, where average wind speeds of above 7 m/s, and a wind power density above 200 W/m^2, are common.

[67] GoB. 2020. Integrated Resource Plan for Electricity for Botswana. October 2020. Ministry of Minerals and Energy.

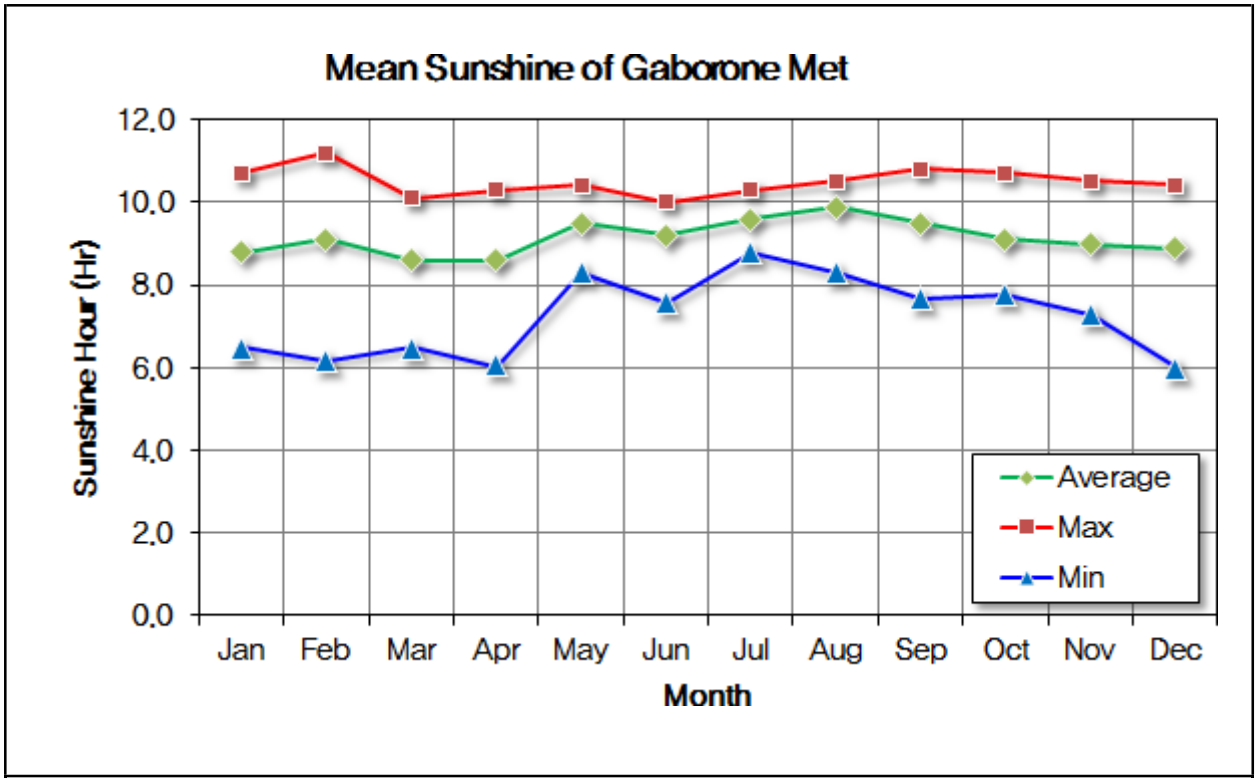

Figure 4. Average Monthly Sunshine (Hours) (Gaborone Met)

Table 5. Gaborone monthly average solar radiation intensity (Ra)

Latitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
20	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
30	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
24.7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0

6.5.2 Wind Energy

Wind is important as part of the green energy where windmills can be used to generate electricity. Botswana is one of the windiest countries in the SADC region. The monthly average wind speed is summarized in Table 6. The average wind speed is the highest in Mahalapye at 4.20m/s per month and the smallest station was Shakawe at 2.78 m/s.

Table 6. Average monthly wind speed (m/s).

Station	Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
033-FRAN	Synoptic	3.30	3.10	3.10	2.90	2.50	2.50	2.60	3.10	3.60	4.00	3.60	3.10	3.12
035-SSKA	Synoptic	3.34	2.83	2.73	2.47	2.26	2.31	2.47	2.93	3.50	3.96	3.65	3.34	2.98
037-GABO	Synoptic	3.34	2.83	2.73	2.47	2.26	2.31	2.47	2.93	3.50	3.96	3.65	3.34	2.98
039-GANT	Synoptic	3.31	2.92	2.89	2.96	2.85	2.86	2.90	3.11	3.22	3.25	3.35	3.21	3.07
	SASSCAL	1.45	1.13	1.25	1.47	1.26	1.22	1.18	1.68	1.32	1.18	1.08	1.02	1.27
041-GOOD	SASSCAL	2.19	1.53	2.23	1.56	2.06	1.90	1.63	2.43	2.60	2.46	2.19	2.28	2.09
064-KASA	Synoptic	3.12	3.14	2.96	3.28	3.29	3.23	3.50	3.62	3.86	3.93	3.41	3.05	3.37
106-MAHA	Synoptic	4.32	4.18	4.16	3.86	3.64	3.53	3.76	4.29	4.55	4.93	4.72	4.36	4.19
	SASSCAL	2.50	2.09	1.74	1.30	1.39	1.18	1.12	1.64	2.29	2.68	2.26	2.06	1.85
130-MAUN	Synoptic	3.09	3.02	2.96	3.04	2.98	3.10	3.20	3.35	3.64	3.81	3.48	3.31	3.25
183-PAND	SASSCAL	1.42	1.21	1.48	1.71	1.64	1.68	1.60	2.02	2.28	2.31	1.40	1.04	1.65
223-SHAK	Synoptic	2.70	2.66	2.56	2.78	2.67	2.67	2.65	2.70	2.81	3.38	2.90	2.74	2.77
	SASSCAL	0.82	0.85	0.97	1.31	1.17	1.16	1.11	1.27	1.25	1.09	0.58	0.65	1.02
244-TSAB	Synoptic	4.18	3.79	3.15	3.40	3.12	3.19	3.27	3.63	3.79	4.25	4.45	4.31	3.71
	SASSCAL	0.75	0.72	0.99	0.64	1.24	0.76	0.65	1.08	0.56	0.47	0.67	0.86	0.78
251-TSHA	Synoptic	3.18	3.19	3.22	3.22	3.05	3.07	3.24	3.62	3.55	3.61	3.62	3.41	3.33
	SASSCAL	0.81	0.61	0.86	1.12	1.13	0.93	0.72	1.28	0.63	0.44	0.83	0.84	0.85
259-WERD	SASSCAL	1.18	0.81	1.19	0.86	1.11	1.12	0.92	1.44	0.85	0.66	0.86	1.04	1.00

The CBM generation initiative targets a 10 MW project and is expected to generate electricity for the national grid by 2025 (GoB 2020). The projection of production of renewable or Blue Energy production in Botswana is shown in Table 7 below).

Table 7. Approved Integrated Resource Plan (IRP) Project.

Generation Capacity	Technology	Commercial Operation Date	Status
100MW	Solar PV	20222022	Under Procurement
35MW	Solar PV	2025	Under Procurement
10MW	CBM	2026	Under Procurement
200MW	CSP	2026	Procurement to start during 2021
300MW	Coal	2026	Procurement to start in 2021
50MW	Wind	2027	Procurement to start in 2024 after wind resource mapping is complete
100MW	Solar PV	2027	Procurement to start in 2025

Note: CSP = Concentrated Solar Power; (CBM) Coal-Bed Methane

6.6 Surface and ground water

6.6.1 Sources of water

Botswana is classified as a "warm desert climate" and a "warm-arid climate". Most of the water is located in the northwest, far from the population centre in the eastern corridor. The dependency ratio, reflecting that part of the total renewable water resources originating outside the country, is the highest in southern Africa at 80 percent. Approximately 34% of the total water supply is supplied by surface water, and 66% is supplied by ground water. All of the country's major drainage basins are shared with other countries (see Fig. 5 below), namely:

- The Limpopo River basin, occupying about 14 percent of the country in the east; shared with Zimbabwe, South Africa and Mozambique.
- The Orange-Senqu River basin, occupying about 12 percent in the south; shared with Namibia, Lesotho and South Africa.
- The Zambezi River basin, occupying 2 percent in the north; shared with seven other countries.
- The Okavango Delta, which is an endorheic basin occupying about 9 percent in the northwest; shared with Angola and Namibia.

According to the National Water Policy of 2012, low and unreliable rainfall, with high rates of potential evapotranspiration, combined with very flat topography result in low rates of surface runoff and low rates of groundwater recharge (GoB 2012). Together with the Chobe and Linyati rivers, the Okavango Delta accounts for 95 percent of all surface water in the country.

This large inland delta in the northwest includes about 6,000 km^2 of permanent swamp and between 7,000 and 12,000 km^2 of seasonally inundated swampland.

Furthermore, groundwater in Botswana is limited, both in quantity and quality, and is unevenly distributed over the country. The extractable volume of groundwater is estimated to be about 100 km^3 (see Table 8). However, only 1 percent of this amount is rechargeable by rainfall due to the prevailing hydro-climatic characteristics and geological nature of the aquifers. Although the amount of groundwater potentially available is large, it is relatively expensive to exploit and saline in many places. In this regard, one of the objectives of the National Water Policy is to promote integrated planning and development of water resources at different levels and in different sectors in order to maximize economic benefits from its productive application (GoB 2012)[68].

[68] GoB 2012. Botswana National Water Policy. October 2012. *Ministry Minerals, Energy and Water Resources.*

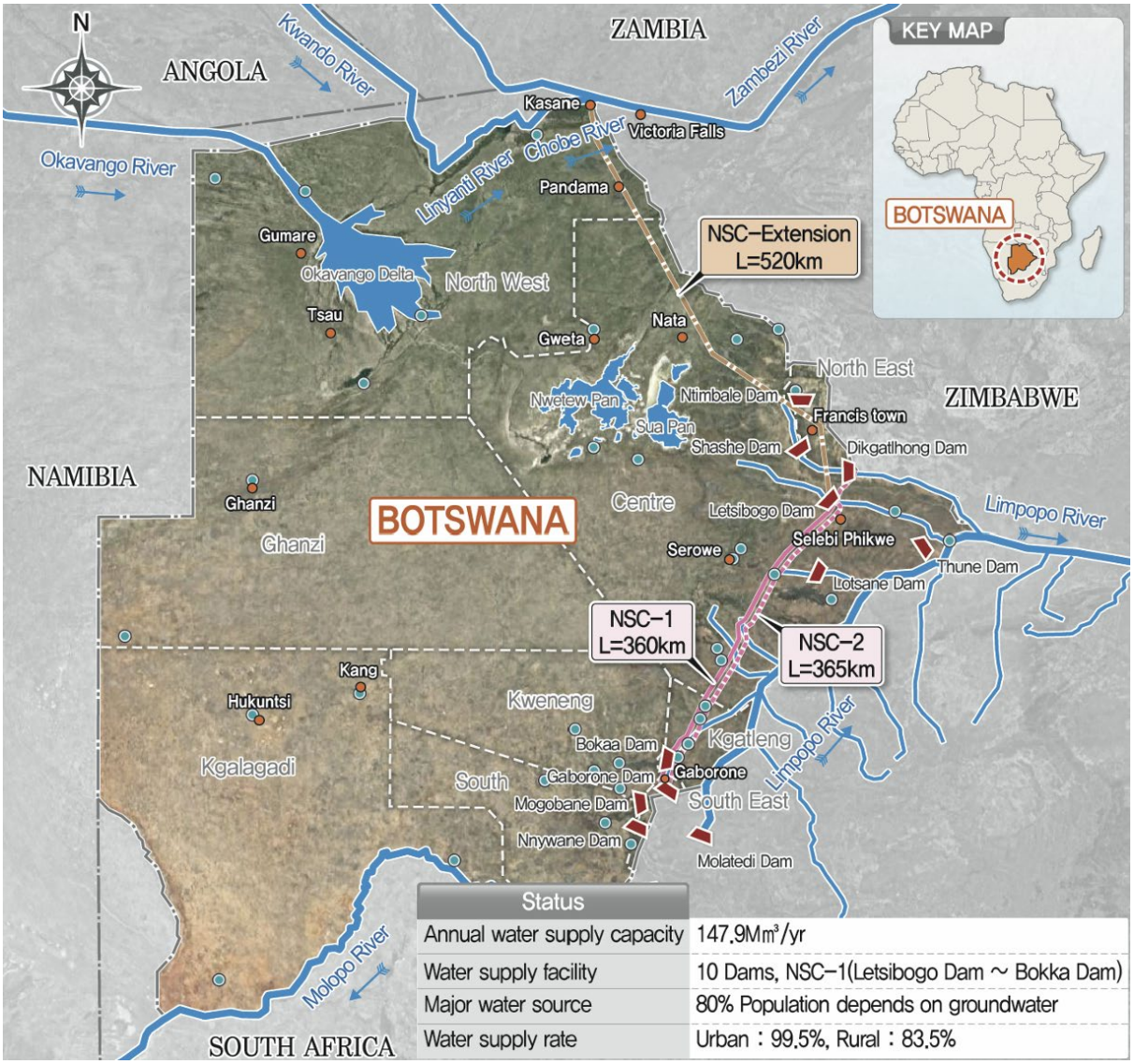

Figure 5. Location of Botswana and Water Resources.

Table 8. Groundwater availability in Botswana (2009-2011).

Well field	Developed available resource (㎥/d)	Cumulative Resources developed (㎥/d)	Sustainable Resource (M㎥/yr.)
Dukwi	5,700	5,700	0.039
Palla Road	7,500	13,200	1.46
Ghanzi	1,850	15,050	0.68
Kanye	3,950	19,000	1.44
Letlhakane	1,500	20,500	0.06
Gaotlhobogwe	7,500	28,000	5.84
Palapye	4,000	32,000	1.64
Ramotswa	5,000	37,000	1.83
Serowe	6,200	43,200	1.28
Tsabong	2,000	45,200	0.73
Kang-Phuduhudu	7,860	53,060	3.27
Boteti	8,950	62,010	1.96
Maitengwe	9,400	71,410	3.43
Matsheng	9,600	81,010	3.52
Pitsanyane	1,000	82,010	0.37
Maun	8,000	90,010	10.07
Masama	36,016	126,026	7.3
Botlhapatlou*	14,000	140,026	-
Bobonong*	3,800	143,826	-
Mabule Dolomite Cluster*	3,000	146,826	-

NB: ㎥/d refers to Cubic Meters per Day. M㎥
Source: Botswana Environment statistics 2012

There are more than 25,000 officially registered boreholes of which over 10,000 are owned by the Government for the purpose of water supply (Table 9).

Table 9. Water Abstraction Rates

No.	Management Area	Number of Intake Source	Number of Borehole	Intake Volume (m^3)
1	Maun	2	56	3,753,228
2	Letlhakane	1	19	2,415,216
3	Ghanzi	1	35	1,385,605
4	SelebiPhikwe	3	26	8,246,083
5	Tsabong	1	53	1,521,030
6	Kanye	1	60	7,060,404
7	Gaborone	4	2	9,777,975
8	Serowe	2	53	3,684,910
9	Mahalapye	2	60	5,045,189
10	Mochudi	2	26	3,386,319
11	Molepolole	1	85	7,243,712
12	Masunga	2	41	4,610,033
13	Francistown	1	-	15,503,377
14	Palapye	2	32	5,040,629
15	Lobatse	3	64	2,097,483
16	Kasane	1	2	1,755,715

Source : Water Utilities Corporation Report

6.6.2 Water Consumption

As of 2013, water consumption in Botswana was 42% for agriculture, 23% for mining and 25% for households. Most of the water sources are located in the north of Botswana, while most people live in the south-eastern region, around Gaborone and Francistown, causing disparities in water supply and demand. In order to reduce this disparity and dependence on groundwater, the Government of Botswana constructed dams and the NSC and supply water about 25Mm^3/year to the southeast through NSC-1. The country plans to supply an additional 45 Mm^3/ year through a two-phase expansion plan, and in the long term has a water transfer scheme to take water from Chobe-Zambezi, Lesotho Highlands and Windhoek Sea.

6.6.3 Water Transfer

In order to reduce water scarcity where there is majority of the population, the government initiated a North South Carrier scheme (NSC) in the late 1990s. NSC is a water transfer Scheme that transmits water from the north of the country to the south to meet the rising water demands. The NSC has three (3) phases with phase 1 completed in 1999 and second phase of the scheme commenced in 2012 (Paya et al 2012)[69] (see Fig. 6 below). In future settlements such as Kanye, Moshupa and others will be connected to the pipeline. During the periods of 2012/13 and 2013/14, the transfer scheme supplied 23.6 and 36.1 Mm^3 respectively to Gaborone and the surrounding settlements (Centre for Applied Research and MMEWR, 2015). It is also

[69] B. Paya, G.T. Matsiara, I.J. Bettesworth, M. van der Walt, P. du Plessis, B. Bosman, D. Stephenson, N. Mbayi, A. Keabetswe. 2012. BOTSWANA'S NORTH SOUTH CARRIER 2 WATER TRANSFER SCHEME A new lifeline towards unlocking the potential of eastern Botswana. Conference proceedings\Technical papers\ID107 Paper107 v.

envisaged that a pipeline will be constructed from Kazungula and Lesotho to transport water to water deficit part of the country.

Figure 6. North-South Water Carrier Route and Proposed Extension from the Zambezi.

6.7 Water Transport and Communications.

Under the Ministry of Transport and Communications, transport in Botswana is guided by the Integrated Transport Master Plan 2021. According to Vision 2036, "Our country will be developed into a regional transport corridor moving and connecting people, goods and services with the rest of the world" (GoB 2016). Through the Vision, Botswana aims to use transport infrastructure and services as conduits to achieving greater regional integration and transforming it into the second regional transport hub in southern Africa. In this regard, **t**he transport sector development vision for Botswana is to **"Go Regional"** and create a paradigm shift from inward looking and being **"at the end of the line"** to outward looking and positioning itself to be **"the centre or second hub"** of the region. Botswana aims to develop into a transport hub within the SADC region, transforming its transport and logistics industry into a major growth area.

While transport is key to economic development, it is also a source of greenhouse gasses. In Botswana, transport is one of the major emitters of carbon dioxide (2264,32 Gg) only next to energy industries (4178,44 Gg). Emissions from the Transport were reported to contribute 28.6% to the Fuel Consumption Activities (GoB 2019)[70]. Therefore, strategies to minimise emissions from transport are critical for Botswana.

Where water transport is feasible, it is possible to achieve emission reduction targets because water transport carries more people and cargo per unit of carbon emitted. Among the modes of transport, water transport (via the pontoon at the Zambezi River) has been very important for Botswana. Before the bridge was built over the Zambezi at Kazungula, the pontoon carried the

[70] GoB. 2019. Botswana's Third National Communications to the United Nations Framework Convention on Climate Change. October 2019. Minister of Environment, Natural Resources Conservation and Tourism.

second largest number of passengers, only next to air transport (Statistics Botswana 2022)[71] (see Table 10 below).

In 2018, Kazungula Ferry was used for the transportation of both goods and passengers to countries in the north, mainly Angola, Democratic Republic of Congo (DRC), Zambia and Zimbabwe (Statistics Botswana. 2018)[72].

Table 10. Number of Passengers Carried by Year and Mode of Transport (2013 – 2022).

Parameter	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Air	783,655	755,721	720,906	764,146	806,959	859,947	912,777	213,681	315,561	652,141
International	406,438	413,425	412,705	439,103	473,876	500,997	527,083	104,348	154,536	351,878
Domestic	377,217	342,296	308,201	325,043	333,083	358,950	370,659	109,333	239,710	300,263
Rail	..	..	..	109,272	134,702	232,160	246,192	..	..	..
Pontoon	438,416	448,557	476,740	502,759	484,023	569,410	..	156,802	..	..
Arrivals	217,452	221,546	234,532	250,042	255,115	287,851	..	75,018	..	..
Departures	220,964	227,011	242,208	252,717	228,908	281,559	..	81,784	..	..
Kazungula Bridge	..	..	..	..	..	..	..	..	122,014	..

Source: Ministry of Transport & Public Works (Statistics Botswana 2022).

Furthermore, in order to ensure efficient regional integration, Botswana needs to explore options for (i) improving linkages to seaports, (ii) integrating inland river ports and (iii) navigability of its inland waterways. Consequently, in 2022, the Minister of Transport and Communications reported that Botswana was development Inland Dry Port internally as well as developing a Dry Port in Walvis Bay (which have been budgeted for in the coming financial year (Parliament of Botswana. 2022)[73].

The Ministry of Transport also aims to the enhance the capacity of the country to leverage on technology to achieve reduction of emission. In this regard, the Information and Communication Technology Sector ICT Policy has seven (7) pillars, among which are e-agriculture, e-business, e-government, and e-tourism.

6.8 Blue Tourism and Recreation

According to the Visions 2036, the tourism industry is one of the major contributors to the economic growth, diversification and job creation in Botswana; and therefore, the Vision aims for "the tourism to be diversified to provide economic growth and employment opportunities for local communities" (GoB 2016).

Botswana recorded a total of 328,500.00 tourists in 2020, By putting the tourist numbers in relation to the population of Botswana, the result is much more comparable picture: With 0.12

[71] Statistics Botswana. 2022. Botswana Transport & Infrastructure Statistics Report 2022. February 2024. Statistics Botswana.
[72] Statistics Botswana. 2018. Transport & Infrastructure Stats Brief Q2 2018. Botswana Transport & Infrastructure Statistics. November 2018. Statistics Botswana.
[73] Parliament of Botswana. 2022. Ministry of Transport and Communications Committee of Supply Speech 2021/2022. Presented by the Minister of Transport and Communications, Hon. Thulagano Merafe Segokgo. Parliament.

tourists per resident, Botswana ranked 94th in the world. In Southern Africa, it ranked 2nd (WorldData 2024)[74]. According to WorldData (2024), in 2021, Botswana generated around 294.60 million US dollars in the tourism sector alone (Table 11). This corresponds to 1.4 percent of its the gross domestic product and approximately 11 percent of all international tourism receipts in Southern Africa. In relation to the country's total export value, tourism rose from 7.44 percent in 2015 to 11.44 percent in 2019 but dropped to 4.61 percent in 2020 (Table 12).

Table 11. Total Tourism Revenues.

Year	Number of tourists (m)	Receipts (US$ m)	% of GDP
2015	1.66	534.30	3.9
2016	1.71	505.00	3.3
2017	1.78	542.01	3.4
2018	1.83	584.20	3.4
2020	0.3285	217.00	1.5

Source: Worlddata.com (2024).

Table 12. Tourism as Percent of total Exports.

Year	2015	2016	2017	2018	2019	2020
Percent of exports	7.44	6.14	7.85	7.76	11.44	4.61

Source: Compiled by the author using the World Bank data

One of the keys to tourism is the conservation of biodiversity upon which tourism is based. It is for this reason that the 2022 Voluntary National Review (VNR) Report for the United Nations Sustainable Development Goals (SDGs), noted that biodiversity has been central to Botswana's development agenda and the country has relied on its rich biodiversity (an array of ecosystems which includes the Okavango delta, two perennial rivers and diverse habitats) for livelihoods and economic development.

Therefore, Botswana's guiding principles for tourism are (i) to ensure that ecosystems, species and genetic diversity are valued and protected; and (ii) sustainable use of biodiversity to the benefit of the communities and the economy (GoB and UN 2022)[75]. These principles are more important, considering that significant portion of Botswana's tourism is water-based. As such, tourism activities as boating in the Okavango Delta are negatively affected when water levels are low. This is particularly worrying for locals who depend on the income from transporting tourists around the Okavango swamps in mekoro (or canoes) (Reinstein, 2016). Since both the Okavango Delta and the Chobe River Plains are national treasures, they warrant the stewardship of best leadership and managerial talents the country can afford (Leechor and 2017)[76].

[74] WorldData. 2024. World Tourism in Botswana. Development of the tourism sector in Botswana from 1995 to 2020. April 2024.

[75] GoB & UN. 2022. Botswana 2022 Voluntary National Review Report for Sustainable Development Goals (SDGs). Ministry of Finance in collaboration with United Nations in Botswana.

[76] Leechor, C. and M. 2017. Developing tourism in Botswana : progress and challenges. World Bank and Botswana Institute for Development Policy Analysis.

6.9 Blue Economy Knowledge, biotechnology and bioprospecting

A sustainable Blue Economy is where there is (a) sustainable production and consumption, (b) resource users put in place governance instruments that lead to effective natural resources protection; (c) benefits are equitably distributed; and (d) underpinned by science, technological advancement and innovations. It is for this reason that the High-Level Panel for a Sustainable Ocean Economy was established in September 2018 and informs the Ocean Panel's action agenda on 'Transformations for a Sustainable Ocean Economy'. The High-Level Panel has a headline commitment to sustainably manage 100% of the ocean area and five associated pillars for action, including Ocean Knowledge (UNESCO 2018)[77].

Another important area for search for knowledge is bioprospecting and aquatic biotechnology. Bioprospecting is the search for active ingredients for pharmaceuticals or other commercially useful compounds among living organisms; and it is an important source of medicines (Frisvold 2023)[78]. Besides directly providing raw materials for pharmaceuticals, natural products provide information for pharmaceutical development. A common organism in aquatic bioprospecting has been microalgae. Microalgae can be used as alternative foods due to their nutritional contents; however, freshwater microalgae are still rarely investigated for use as alternative foods, despite their abundance and diversity (Prihanto et al. 2022)[79]. Although many countries in the Tropics have a high diversity of microalgae, their potential is still underexplored (Prihanto et al. 2022); and this is the case with Botswana.

According to Mosepele and Mosepele (2021)[80], the Okavango delta has a wide range of aquatic biodiversity. In a study of the microalgae of Okavango, (Marazzi. 2013)[81]six green algae, one diatom, and one cryptomonad. This aquatic biodiversity can be bioprospected to develop nutrients or pharmaceuticals. In China, people have long used microalgae as food sources. Commonly used microalgae include Arthrospira, Nostoc, and Aphanizomenon. Moreover, the genetic properties of Botswana's aquatic organisms are generally poorly described.

To achieve the vision of Sustainable Ocean Economy, three critical steps in the ocean science value chain were identified and they include (i) the identification of knowledge needs, (ii) the generation of knowledge and (iii) the use of that knowledge, all supported by extensive capacity development. Therefore, the Botswana Blue Economy Strategy will adopt these three High-Level Panel for a Sustainable Ocean Economy's Ocean Knowledge value chains.

While Botswana has done a lot to enhance its capacity for inland waters ecosystems science, there are still gaps to be closed in order to optimise the three ocean science value chain. For

---

[77] UNESCO. 2021. The United Nations Decade of Ocean Science for Sustainable Development **(2021–2030).** February 2021, the United Nations Educational, Scientific and Cultural Organization. Paris, France

[78] Frisvold, G.B. 2023. Bioprospecting and Incentives for Biodiversity Conservation: Lessons from the History of Paclitaxel. *In:* D. Zilberman et al. (eds.), Sustainable Resource Development in the 21st Century, Natural Resource Management and Policy 57, https://doi.org/10.1007/978-3-031-24823-8_14

[79] Asep A. Prihanto1,2,*, Yoga D. Jatmiko3, Rahmi Nurdiani1,2, Anis Miftachurrochmah2 and Mamoru Wakayama4. Freshwater Microalgae as Promising Food Sources: Nutritional and Functional Properties. The Open Microbiology Journal, 2022, Volume 16.

[80] Mosepele, Q.B, Mosepele K. 2021. Review of Aquatic Biodiversity Dynamics in the Okavango Delta: Resilience in a Highly Fluctuating Environment [Internet]. Inland Waters - Dynamics and Ecology. IntechOpen; 2021. Available from: http://dx.doi.org/10.5772/intechopen.93259

[81] L. Marazzi. 2013. Okavango Delta - Biodiversity of Microalgae, precious invisible plants. Biodiversity & Ecology 5 2013.

example, the Global Ocean Science report of 2017 reported that Botswana had 61 published papers and 174 citations received in ocean or inland waters ecosystem science, including fisheries and aquaculture, over the period between 2010 and 2014 (UNESCO 2017)[82].

6.10 Ecosystem services generated by coastal, marine and aquatic ecosystems

Under the National Biodiversity Strategy and Action Plan (GoB 2016)[83], stakeholders identified the major threats to biodiversity to be Changes to hydrology and water quality of inflowing rivers, and the main causes being (i) nutrient runoff in catchment in neighbouring countries; (ii) increased development, industrialisation, mining and urbanisation; (iii) land and resource use practices (e.g. agriculture and water harvesting); (iv) leaching of soil salts and nutrients due to poor irrigation practices; (v) deforestation and proliferation of alien plant and animal species; and (vi) damming of rivers. The major impact of these were said to include (a) decreasing variability in flow, cessation of low season flow, eutrophication, decreasing water quality, decrease in sediment inputs, decrease in sediment carrying capacity; (b) change in the timing, duration, quality and extent of annual floods; (c) algal blooms and proliferation of alien aquatic plant species.

The major implications for these were reported to be (1) loss of floodpulse that may lead to converting the deltaic systems to a single course river channel, and losing extensive seasonally flooded floodplains; (2) change to the character and functioning of Botswana's primary biodiversity hotspot – the Okavango, leading to loss of ecosystem services and natural resources for both rural livelihoods and the national tourism industry; and (3) change from fresh water to more saline conditions.

Ecosystem services in Botswana have been estimated using indirect uses. The estimated ecosystems services for the Okavango and Makgadikgadi areas, put these values to be significant and generate direct gross value added of BWP 379 million and BWP 155 million for the two areas respectively (GoB 2016)[84]. These freshwater ecosystems, being the large are of permanent and seasonal rivers, floodplains and freshwater marshes, represent possible ecosystems where the marsh vegetation can possibly play a role of carbon sequestrations. These seasonal rivers and freshwater ponds and mashes ais subterranean circulation of water in parts of the site and aid in groundwater recharge; as well as provide spawning ground for fish and refuge for nursing.

[82] UNESCO. 2017. Global ocean science report: the current status of ocean science around the world. UNESCO.
[83] GoB. 2016. National Biodiversity Strategy and Action Plan. Department of Environmental Affairs. Gaborone.
[84] GoB. 2016. National Biodiversity Strategy and Action Plan. Department of Environmental Affairs. Gaborone.

7.0 Mega trends driving the BE sector

The development of the Blue Economy in Botswana is likely going to be influenced by eight (8) mega trends. These trends are going to have major implications on the investments and sustainability of the water ecosystems. Such tends are also likely going to have influence on the type of knowledge (and hence science, technology and innovations) required to inform exploitation, conservation and management plans. The section below elaborates on the eight mega trends.

7.1 Population rise.

The 2022 Population and Housing Census continues to grow (15.9% between 2011 and 2022), albeit at a decreasing rate (Statistics Botswana 2022)[85]. This population growth is going to raise the demand for fish, living space, energy and water, thus putting pressure on the freshwater resources as well as extraction of renewable and non-renewable natural resources from the aquatic ecosystems. The predominantly tourist District of Ngamiland East recorded increases in its share of the national population. Incidentally, some of these tourist areas are along the major rivers, and floodplains.

7.2 Rise in demand for food

Demand for food generally and specifically fish, is rising in Botswana. While fish production is also rising, demand is outstripping supply. Consequently, demand is putting pressure on fisheries resources leading to overfishing and a rise in fish imports (see section x above). Botswana's national demand is 5,000 metric tonnes but currently it only produces 550 metric tonnes from aquaculture and captured fisheries annually.

Economic development, urbanization and population growth is shifting food systems from traditional to mixed systems, where access to food is increasingly connected to markets (Chimatiro et al 2021). Out of Botswana's total imports valued at P8. 3 billion in October 2023, food imports accounted for 17.3 percent. Within the food category, cereals accounted for 12.9 percent (Weekend Post.17 Jan 2024). About 40% of vegetables consumed, but less than 20% of cereals are produced domestically.

7.3 Rising numbers of investor farmers

Due to rising demand, prices of all foods, including fish, prices of food, particularly fish, tends to also rise, attracting investors into food-related enterprises, in search of descent returns on invests. In fish farming, more investors have been attracted by the various government aquaculture promotion programmes. Therefore, shareholder-driven food production investments (where owners of the farms are non-rural dwellers, and often non-indigenous citizens of Botswana) may lead to rising demand for water, beyond the capacity of existing Blue Domains. Such rising investments may also drive over-capacity on some of the aquaculture hotspots, such as reservoirs (i.e. cage culture), as well as the Okavango delta. .

[85] Statistics Botswana. 2022. 2022 Population and Housing Census.

7.4 Blue Energy and Mining

The existing power generation system of Botswana is mainly based on fossil fuels e.g. coal-fired power plants. The rising demand for energy and minerals will drive the search for sustainable blue energy and mineral prospecting, including from freshwater ecosystems. Two major factors are responsible for mining, namely (i) the need to increase production as terrestrial sources of mineral are dwindling; and (ii) to need to find minerals that will help countries decarbonise the energy, manufacturing as well as the transport systems. The former is driving demand for all types of minerals; while the latter is driving the search for materials that are used in the renewable energy technologies (solar panels, electric vehicle batteries, wind turbines, etc). The Integrated Resource Plan for Electricity for Botswana aims for generation of renewable energy in order to reduce coal contribution from the current 99% to 61% (GoB 2020). While the Integrated Resource Plan for Electricity has provided an overview of the prospects for solar and wind, there could be options for generating electricity form other such means as floating solar panel. Therefore, detailed feasibility studies need to be undertaken to explore more options, including for public-private partnerships in renewable energy.

7.5 Transport as a Catalyst for Regional Integration

According to Vision 2036, "Our country will be developed into a regional transport corridor moving and connecting people, goods and services with the rest of the world". Some assessment of Botswana shows that the country lacks competitiveness caused by weak infrastructure, and poor connection to the network of cross-country corridors

7.6 Climate change, Environmental and Biodiversity Management

Addressing threats posed to the health of the freshwater resources is critical in order to safeguard its contribution to these resources to Botswana's Blue Economy. Moreover, Mosepele and Mosepele (2021)[86] reported evidence of changes at the local state where the Okavango delta has shifted regimes and entered into altered states as a consequence of either channel or lagoon failure. Increasing economic activities, especially tourism and agriculture, in the Okavango delta poses a significant threat to the ecosystem. For example, Skelton et al (1985)[87], noted that insecticide spraying, encroachment of cattle onto the seasonal floodplains, pollution from boat engines, disruption of ecosystem function, and alteration of the flood regime, are some of potential threats to the Okavango delta.

Consequently, Botswana intends to achieve an overall emissions reduction of 15% by 2030, taking 2010 as the base year (NDC 2022). Noting that Botswana is a water-scarce country, there is a need for the country to pay particular attention to vulnerability of the water sector. Vulnerability of water sector is a function of sensitivity of the water sector to climate change and the adaptive capacity of the system to climatic variability (Dessai and Hulme, 2004; IPCCC, 2009, 2011). Whilst surface water resources are highly exposed to climate change through increase in temperature and reduced rainfall, groundwater is sensitive to climate change through reduced

[86] Mosepele, Q.B, Mosepele K. 2021. Review of Aquatic Biodiversity Dynamics in the Okavango Delta: Resilience in a Highly Fluctuating Environment [Internet]. Inland Waters - Dynamics and Ecology. IntechOpen; 2021. Available from: http://dx.doi.org/10.5772/intechopen.93259

[87] Skelton, P.H., Bruton, M.N., Merron, G.S., and B.C.W. van der Waal. 2021. The fishes of the Okavango drainage system in Angola, South Africa and Botswana: Taxonomy and distribution. Ichthyological Bulletin of the J.L.B. Smith Institute of Ichthyology. 1985;50:21.

recharge and increased abstraction to meet the water demands. Therefore, climate change could transfer pressure to groundwater through scarcity of surface water resources (GoB 2019)[88]. In this regard, the Botswana Blue Economy Strategy should be underpinned by adaptation priorities that are guided by: (i) The Second National Communication to the United Nations Framework Convention on Climate Change; (ii) Sustainable Land Management; and (iii) National Water Master Plans.

Furthermore, Adaptations Actions should focus on the water sector. Here actions should aim to (i) reduce water loss during transmission by investing on telemetric monitoring systems; and (ii) enhance conjunctive groundwater-surface water use.

Additionally, adaptation actions need to be directed at the agriculture sector. Here strategies should focus on (i) improving genetic characteristics of the livestock breeds such as Musi breed in order to attain faster growth; (ii) improve livestock diet through supplementary feeding; and (iii) switch to crops with such traits as drought resistance, tolerance to high temperatures, and short maturity.

7.7 The need to Generate and Disseminate Knowledge and Innovations.

Development of Blue Economy comes with a lot of unknowns; therefore, profiling the risks of the investment options will enable Ministries, Departments & Agencies (MDAs) to attract requisite investments (public and private). While research and innovation that directly address the knowledge gaps are emerging globally, there is a evidence from the UNESCO Global Ocean Science report of 2017 that Botswana is lagging behind on blue knowledge. Therefore, there is a need for Botswana to focus on national and area-specific research to generate Blue Economy-related data that will inform the knowledge-based Blue Economy. Special efforts should target building partnerships with international and multilateral agencies that are actively involved in Blue Growth, such as the AfDB, World Banks in order to draw lessons from global best practices.

7.8 Diversification of the National Economy Beyond the Land-based Activities: Challenges the contribution of Blue Economy

The Vision 2036 raises a number of questions, including (i) does the country continue to rely on diamond as the mainstay of the country's economy, or does the country make concerted, serious strides towards diversification? (ii) does the country continue to generate its income from the consumption of its mineral good fortune, or is there a need to focus on being competitive, productive and efficient? (GoB 2016). Therefore, Blue Economy offers Botswana an option to diversify by bringing in the Blue Domain into a stream of economic activities. However, for Botswana to exploit the development of Blue Economy, there is a need to address several complex constraints.

These constrains mainly include institutional. Therefore, there is a need to pay attention to such institutional issues as strategic orientation towards Blue Economy. Governance of natural resources, especially those in the Blue Domain needs to be enhanced. Since Blue Economy is new, there is a need to address legislative and regulatory gaps in order to mainstream Blue

[88] GoB. 2019. Botswana's Third National Communications to the United Nations Framework Convention on Climate Change. October 2019. Minister of Environment, Natural Resources Conservation and Tourism.

Economy in national development. Blue Economy cannot be realised unless there is a long-term orientation of Blue Economy sector financing.

8.0 The Goal and Strategic Objectives of the Botswana Blue Economy Strategy

The vision, mission and general objective for the Botswana Blue Economy Strategy, as was agreed by the stakeholders at the national consultative workshop in Gaborone, are shown below.

Vision:

An inclusive and sustainable blue economy that creates wealth and significantly contributes to social economic development of the country.

Goal:

To facilitate the coordination of inter-sectoral governance of Botswana's Blue Economy for Sustainable Development.

Objectives:

1. To enhance coordination of inter-sectoral planning for the blue economy strategy implementation.

2. To increase the contribution of fisheries and aquaculture to national socio-economic development.

3. To optimise the utilisation of transportation and tourism in freshwater systems that enhances blue sustainability.

4. Promote innovative research and capacity building that is relevant to Blue Economy.

5. To increase contribution of renewable blue energy and sustainable extraction of aquatic mineral resources.

6. To improve environmental sustainability and ecological health of freshwater ecosystems.

7. To increase awareness and contribution of blue freshwater ecosystem services.

Thematic areas for the National BES development:

1. Governance and Inte-sectoral Coordination
2. Fisheries Management and Aquaculture Development
3. Inland waterways transport and Tourism
4. Research and Technology Development.
5. Blue energy and mining
6. Water resources Management
7. Ecosystem services (Supporting, Provision, Regulate and Cultural)

Table 13. Thematic Areas, Strategic Objectives and Interventions

Thematic Areas	Strategic Objectives	Interventions
Governance and Inte-sectoral coordination	To enhance coordination of inter-sectoral planning for the blue economy strategy implementation.	1. Coordinate all areas of governance, through inter-sectoral mechanism. 2. Design and implement sustainable blue finance that is accessible for all and drives ecologically sustainable and socially equitable economic growth. 3. Prepare harmonised legal frameworks, policies and development plans in line with Blue Economy, including and identifying the steps required for transition to a blue economy. 4. Improve and align resources (human, extension, financial and infrastructure) 5. Improve capacity to implement the blue economy strategy. 6. Promote gender-inclusive aquatic-based economic activities, with women-targeted financing and enterprise models for supply chains.
Fisheries Management and Aquaculture Development	To enhance contribution of sustainable fisheries and aquaculture to food and nutritional security and socio-economic development of fish-dependent communities and the overall national economy	1. Increase wealth creation from fisheries and aquaculture 2. Develop appropriate production models for Value chains 3. Develop fisheries and aquaculture policy & regulations. 4. Improve aquatic animal health surveillance under blue economy 5. Develop approaches, methodologies and technologies that will increase the profitability of environmentally and socially sound aquaculture to achieve continued sector growth
Inland waterways transport and Tourism	To optimise the utilization of transportation and tourism in freshwater systems that enhances blue sustainability.	1. Develop transport linking main trade corridors from the sea-ports to landlocked Botswana 2. Develop and/or review inland waterways policy and adopt efficient policy 3. Prevent and suppress national and transnational crime, including terrorism, piracy, armed robbery against ships, drug and human trafficking through the waterways 4. Design and implement robust water policy that reduce introduction of non-indigenous aquatic species.
	To develop eco-tourism with an integrated and prospective approach that respect the freshwater ecosystems' health	5. Improve protection, valuation and communication of the country's cultural richness to enhance natural tourism 6. Strengthen linkages between tourism and other production sectors in order to stimulate local entrepreneurship and job creation 7. Put in place strategies to make shore and lake/river-based tourism sustainable, resilient, addresses climate change, reduce pollution, supports ecosystem regeneration and biodiversity conservation 8. Mitigate against environmental degradation; water currents, erosion and sedimentation as a result of the reclamation for tourism.
Research and Technology Development	To promote innovative research and capacity building that is relevant to Blue Economy.	1. Identify and develop requisite skills, knowledge and technology for Blue Economy linked. sustainable development

Thematic Areas	Strategic Objectives	Interventions
		2. Undertake biotechnology and bioprospecting to develop pharmaceuticals, nutraceuticals and food additives. 3. Generate comprehensive knowledge and understanding of the aquatic ecosystems. 4. Promote Blue Bio-economy and biotechnology (life sciences, bio-economy, agri-food, bioenergy, microbial bioremediation) for commercial exploitation.
Blue energy and mining	To transform Botswana's energy reliance away from a dependence on fossil fuels to using renewable energy.	1. Put in place sufficient knowledge and regulations to ensure that any activity related to aquatic mining is informed by science and ecologically sustainable. 2. Develop aquatic mining policy framework for Botswana [from S &G water]. 3. Harmonise guidelines on geospatial information to guide mineral prospecting and exploration [from S&G water].
Water resources Management	To improve environmental sustainability and ecological health of freshwater ecosystems.	1. Develop a detailed and dynamic groundwater potential zone map to facilitate efficient water resources apportionment across different key water uses for socio-economic development. 2. Operationalize Catchment Management Approaches towards improved watershed management and improved monitoring. 3. Strengthen institutional capacities (including at decentralized level), and promote sustainable utilities for better service delivery. 4. Implement measures to reduce nutrient eutrophication of water resources from development activities. 5. Develop and implement water re-use strategies to reduce the impact of climate change on availability of freshwater. 6. Provide adequate wastewater disposal facilities to safeguard aquatic ecosystems.
Ecosystem services (Supporting, Provision, Regulate and Cultural)	To increase awareness and contribution of blue freshwater ecosystem services.	1. Develop and/or implement plans for prudent use of existing and planned reservoirs or dams on the country's rivers to enhance water, sanitation and hygiene (WASH), irrigation and renewable energy 2. Develop collaborative plans for responsible exploits of the country's surface and ground waters (including transboundary resources) 3. Implement measures and harmonize strategies to reduce pollution of water resources from development activities 4. Develop technologies for renewable energy-based solid waste and wastewater treatment 5. Enhance monitoring research efforts to assess ecosystem health, identify threats and inform adaptive management strategies 6. Establish protected areas, conservation reserves and list different categories of protected species to safeguard critical habitats and biodiversity

9.0 SWOT ANALYSIS OF THE BLUE ECONOMY IN BOTSWANA

During the national stakeholder consultations, and based on the online search, a SWOT analysis is presented (Table 13) in order to show internal strengthens, weaknesses as well as external opportunities and threats to the development and implementation of the blue economy value chains in Botswana. Botswana has a very ell developed economy in the SADC region, politically stable and renowned for its impeccable governance structures. There is a strong political will to transform the country into a middle high-income country is espoused in Vision 2036. The stakeholders agreed on clear blue economy sectors as well as institutional structures required to deliver on Blue Economy. Despite these strengths, several weaknesses and threats are likely to impede the transformation process. Key to these is the fact that Botswana is a water-scarce country; and key capacities may need to be developed over time.

Table 14. SWOT Analysis for the Blue Economy in Botswana.

Strengths	**Weakness**
• Peace and political stability • Political will to transform the economy through diversification. • Readiness to crate overarching government institution to coordinate Blue Economy Strategy. • Well-established traditional blue economy sectors (fishing, aquaculture, energy, inland water transport, water-based tourism). • Strong policy focus on fisheries and aquaculture. • Existing transboundary water management institutions (e.g. OKACOM).	• Water-scarcity. • Lack of fish-eating culture. • Limited resources (human, technological, infrastructural) to establish viable Blue Economy value chain. • Limited private sector involvement • Limited awareness or knowledge of the potential for the blue economy • Insufficient value addition of blue natural resources. • Absence of Blue Economy National Accounting methods (i.e. contribution of Blue Economy to (GDP).
Opportunities	**Threats**
• The potential for Blue Economy to add-value to the existing terrestrial economic activities. • Recognition of the importance of the blue economy in Vision 2036. • Strong experience in creating an enabling business environment (e.g. mining, tourism). • Well-studies aquatic resources. • Abundant natural beauty which has already established a world-class tourism sector. • Strong research capacity at the country's universities and their willingness to champion Blue Economy.	• Competition for limited water and biodiversity. • Inadequate implementation of existing conservation measures. • Multiple environmental stressors (e.g., climate change, cyclones, floods, droughts, pollution, habitats degradation, overfishing).

10. Guiding principles

The following guiding principles are imperatives to ensure efficient implementation of the Blue Economy Strategy. These principles are aligned with the country's Vision 2036, regional, continental (PFRS) and international frameworks related to the blue economy.

Participation: within the country's context, all stakeholders should contribute to the development and implementation of subsidiary strategies, in support of the Blue Economy Strategy.

Self-reliance: dependence on Botswana's own efforts and exerting them in building the country through the Blue Economy.

Prioritization: The focus must be on the realistic attainment of specific objectives in line with national or regional priorities

Scalability*:* Activities, wherever possible, must be designed to be suitable for use at different scales, for example at local and national scales and regionally. Scaling must be attained by replication (in different places), and by modification and adaptation of initiatives for different contexts.

Sustainability: Application of the precautionary approach and risk management will guard against undesirable bio-ecological and socio-economic outcomes.

The summary of thematic areas, strategic objectives and interventions can be seen in Table 14 below.

11.0 Mechanism for National Blue Governance Coordination Mechanisms

According to Hufty Marc (2011)[89], setting up a framework for effective institutional arrangement is critical for a functional implementation of a strategy. Therefore, the Blue Governance Framework for the Botswana Blue Economy was agreed upon by the consultative national workshop. The meeting further agreed that the Governance Framework will be responsible for the processes of interaction and decision-making among the actors involved in a collective Blue Economy function. Furthermore, the framework is in line with the AU-IBAR (2020), the Governance Framework as it incorporates aspects of (a) the design, (b) setting up of coordination mechanism, (c) institutional arrangements, (d) operationalisation and management of Blue Governance Coordination Mechanisms; and (e) mechanisms for cooperation with other SADC Member States that already have National Blue Economy Strategies, in order to build synergies at the regional level.

11.1 Current BE Governance in Botswana

The national stakeholder consultative meeting observed that, currently, Blue Economy related activities are governed through several government, ministries, departments and agencies, as well as entities without well-defined linkages with civil society and private sector. These institutions include the following: (i) Government Sectoral ministries; (ii) Civil Society: Fish Association; (iii) Research/Academia/Capacity/Institutions; (iv) Development Partners: UNDP, FAO, USAID, SADC etc; (v) Private Sector, including Business Botswana, Botswana Chamber of Commerce; and (vi) Financial Institutions, including BDIH, CEDA, BDC, NDB, Commercial Banks. Table 15 shows these current institutions.

[89] Hufty, Marc (2011). "Investigating Policy Processes: The Governance Analytical Framework (GAF). *In:* Wiesmann, U., Hurni, H., et al. eds. Research for Sustainable Development: Foundations, Experiences, and Perspectives". Bern: Geographica Bernensia: 403–24.

Table 15. Current Institutions Governing Blue Economy in Botswana.

Government	Civil Society	Research/Academia/ Capacity/Institutions	Development Partners	Private Sector	Finance
1.MME 2. MoL&A 3. Ministry of Trade & Entrepreneurship 4. Ministry of Trade 5. MPWT 6. MLRD 7. MLW 8. Statistics Botswana 9. Ministry of Health 10. MET 11. MYG 12. Ministry of Higher Education 13. Ministry of Youth and Gender Affairs 14. Ministry of Local Government and Traditional Affairs 15. Ministry of Water and Human Settlement 16. Ministry of Transport and Infrastructure 17. Ministry of Communications and Innovation 18. Ministry of State Presidency	**Fish Association**	**Universities Research Institutions Capacity development Standards**	**UNDP FAO USAID SADC AfDB EU World Bank Water Commissions etc. African Union**	**Business Botswana Chambers of Commerce HATAB**	**BDIH CEDA BDC NDB Commercial Banks**

11.3 Challenges of Governance relating to BE

With the current institutional set-up, there are challenges associated with it; and these include the following:

- coordination is currently fragmented as functions are found in different sectoral ministries and departments.
- There is no APEX governing body or coordinating agency responsible for coordinating BE in Botswana, leading to duplications.
- There is no legal framework governing Blue Economy.

11.4 Governance Structure for the Botswana Blue Economy

Therefore, the national stakeholder consultative meeting agreed on governance framework, that has the following attributes:

- **Legal framework:** the institution will be responsible for the establishment of legal frameworks. Among others, the legal framework will facilitate the establishment of a coordinating agency. The agency will coordinate all BE activities holistically.
- **Inclusiveness:** the governance structure should be multi-sectoral and inclusive of all relevant stakeholders that are presented in table above.
- **Domiciliate:** the BE Governance Institution should be pegged at highest office in the government in order to ensure that it has a strong mandate. In this regard, the BE Governance Institution will be domiciled in the Planning Commission – Development Planning. The institution will be called the Blue Economy Coordinating Agency; and dedicated to the coordination of all BE activities, by pulling together all unrelated economic activities, such as energy, transport and aquaculture.

11.5 Organogram of the Blue Economy Governance Structure

Figure 7 below shows the organogram of the Blue Economy Governance Structure as was agreed upon by the national stakeholder consultative meeting

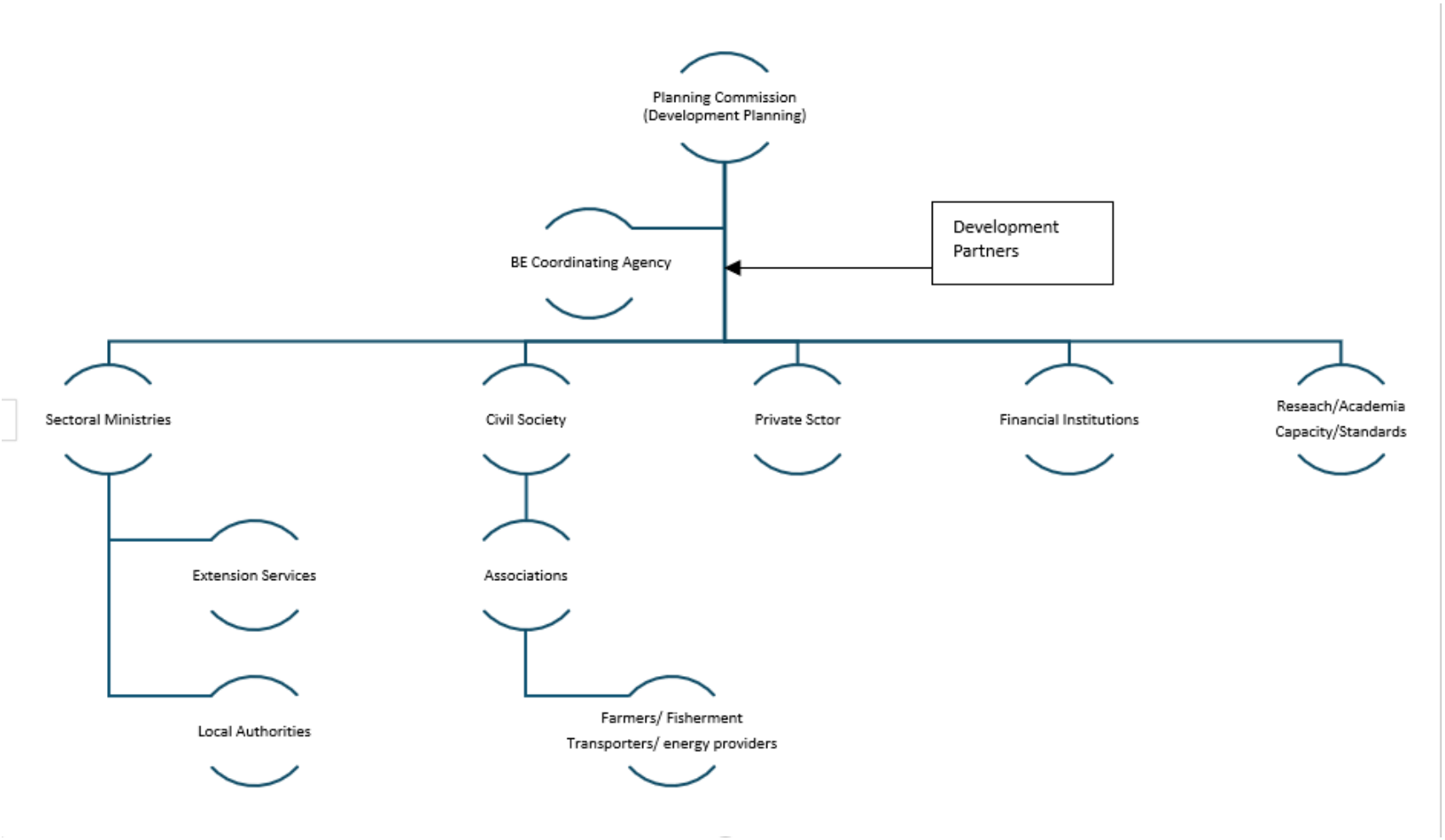

Figure 7. Organogram of the Blue Economy Governance Structure in Botswana.

11.6 Blue Economy Coordinating Agency – Terms of Reference

the national stakeholder consultative meeting further agreed to the Terms of Reference (ToRs) for the BE Coordinating Agency to be as follows:

1. **Coordination Role**
    - Ensure inclusiveness
    - Organise dialogue and development of collective actions
    - Reinforce the public private partnerships
    - Possess the expertise and tools
    - domesticate the Blue Economy Implementation Plan and steer its implementation
    - Periodically evaluate the progress made.
2. **Communication Role**
    - Create awareness about BE
    - Dissemination information and enhance visibility of BE.
    - Ensure inclusivity of stakeholders, including Non-State Actors (NSAs) and civil society.
    - Create a favourable context for the implementation of BE and harmonisation, as well as alignment of sectoral programmes to the National Blue Economy Strategy.
3. **Human and Financial Resources Development Role**

    Recruitment and placement of human resources.

    Mobilisation of financial resourcing for the implementation of the BE

    Motivate for human and financial resources policy in support of the Blue Economy Strategy.

    Design appropriate financing models for BE Strategy for public sector

    Design appropriate financing models for the Blue Value Chain Actors (e.g. equity financing, use of soft loans, bond issuance etc).

11.7 Involvement of River-Based Organisation, RBOs

The national stakeholder consultative meeting further agreed that all the River Based Organisations (RBOs) to which Botswana is a member, should also be closed involved in the implementation of the Blue Economy Strategy to ensure coherence. Table 16 below provides a summary of these RBOs.

Table 16. River Basin Organisations (RBOs) in which Botswana is a member.

Commission	Key Summary
Permanent Okavango River Basin Commission (OKACOM)	· Composed of Botswana, Angola and Namibia (established in 1994) · Plan, use, development and management of the Okavango watershed · Technical consulting and enforcement on water-related issues
Orange-Senqui River Commission (ORASECOM)	· Composed of Botswana, South Africa, Namibia and Lesotho · (Established in 2000) · Advise on the environmental impact and water quality issues of the Orange-Senqui watershed and provide water resources information to each country.
Zambezi Watercourse Commission (ZAMCOM)	· Shared by 8 countries, agreements signed by 7 (established in 2004)- Angola, Botswana, Malawi, Mozambique, Namibia, · Zambia and Zimbabwe · Rational use, efficient management and development of Zambezi river · IZS (Interim ZAMCOM Secretariat) established (2011) · - ZAMCOM's operation plan management and enforcement
Limpopo River Basin Commission (LIMCOM)	· Botswana, Republic of South Africa, Mozambique, Zimbabwe · (Established in 2003) · Advises the Parties on measures for the protection, conservation and management of the Limpopo watershed; · - Determination and preparation of long-term safe water supply

12.0 Transition to the Botswana Government Ministries, Departments and Agencies to Blue Economy

According to World Bank & United Nations (2017), sustainable development implies that economic development is both inclusive and environmentally sound, and to be undertaken in a manner that does not deplete the natural resources that societies depend on in the long term. Therefore, in order for Botswana to transition to Blue Economy, it will be important for the country too guided by a framework that will enable the country to balance the economic, social, and environmental dimensions of sustainable development. The transition framework to be used is based on the World Bank and United Nations" Principles for a Sustainable Blue Economy" (World Bank & United Nations 2017), as well as the World Bank's PROBLUE (World Bank 2021).

The transition will be guided by the following six (6) critical steps:

1. **Effective legal mandate for Blue Economy:** the BE Coordinating Agency should promote adoption of Blue Economy and its institutionalisation. In addition, it is important for specific regulatory instruments to be put in place in order to guide the implementation of BoBES.
2. **Establish coordinating institutions:** the government should ensure establishment of Blue Economy Agencies under Cabinet Decree or any other means that is possible within the instruments provided by the government.
3. **Develop human capital:** there is a need to conduct an assessment of the capacities of the Planning Commission in order to develop requisite human resources for the implementation of the BE Strategy.
4. **Improve governance to grow the Blue Economy:** Botswana should design and implement governance and institutional reforms in order to grow the Blue Economy.
5. **Innovative financing:** Botswana needs to establish a mechanism for financing the Blue Economy Strategy.
6. **Indicators to measure and track progress:** Botswana should harmonise Blue Economy indicators with the other indicators in the Vision 2036.

13.0 Monitoring and evaluation of progress in implementation of the Strategy

This strategy will be implemented over six years, and in line with the Vision 2036. The Strategy will be monitored and evaluated using the Implementation and evaluation Plan (see Table 17). While the Ministry of Agriculture will be the lead agency responsible for implementation and monitoring the strategy, the Blue Economy Coordinating Agency in the National Planning Commission will assume the overall coordinating role.

Table 17. Monitoring and Evaluation Framework for Botswana Blue Economy Strategy

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
1.0 Enhanced coordination of inter-sectoral planning and implementation for the blue economy strategy.					
	Ensure alignment with other existing strategies/commissions	By March 2026 the Coordination Structure is in place	Blue Economy Coordinating Agency	Dec 2024-March 2026	Ministry of Lands & Agriculture
	-Establish a national inter-sectoral coordinating agency	By March 2026 the Coordination Structure is in place		Dec 2024 – Dec 2026	Ministry of lands and Agriculture
	Prepare harmonised legal frameworks, policies and development plans in line with Blue Economy, including and identifying the steps required for transition to a blue economy.	By Dec 31, 2025, harmonised legal frameworks, policies and development plans in place	harmonised legal frameworks, policies and development plans	Dec 2024-Dec 2025	Ministry of Lands and Agriculture
	Design and implement sustainable blue finance that is accessible for all and drives ecologically sustainable and socially equitable economic growth.	By 2026 the financing model is functional and bring funding for BoBES	- Financing Model - Budgeting systems - Budget levels (70%) by 2029	2024-2026	National Planning Commission & Ministry of Finance
	Improve and align resources (human, extension, financial and infrastructure)	By June 2026 an Improved and aligned resources is operational	- BE Human Resource Plan - 70% of Human Resources allocated	Dec 2024-June 2026	Ministry of Lands and Agriculture & DPSM, HRDC
	Improve capacity to implement the blue economy strategy.	By 2028 capacity for implementing the BoBES is in place	70% of the BoBES Plan implemented	2024-2028	National Planning Commission & Ministry of Lands and Agriculture
	Promote gender-inclusive aquatic-based economic activities, with women-targeted financing and	By 2025 inclusive aquatic-based economic activities operational	25% of BE Enterprises are women-owned 10% of BE	2024-2027	Ministry of lands and Agriculture; Ministry of Youth & Gender Affairs and

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	enterprise models for supply chains.		Enterprises are youth-owned.		Ministry of Local Government & Traditional Affairs
2.0 Increased contribution of fisheries and aquaculture to national socio-economic development.					
	Increase wealth creation from fisheries and aquaculture	By March 2026 the wealth-based fisheries and aquaculture approach is operational	Wealth-based fisheries and aquaculture management	Dec 2024-March 2026	Ministry of Lands and Agriculture and Ministry of Trade and Entrepreneurship
	Develop appropriate production models and fisheries and aquaculture value chains	By March 2027 appropriate production models for Value chains in place	- Design & implement appropriate production models for fisheries & aquaculture - Develop fisheries & aquaculture value chains	Dec 2024 March 2027	Ministry of Lands & Agriculture; and Ministry Environment and Tourism
	Develop fisheries and aquaculture policy & regulations.	By 2029 fisheries and aquaculture policy & regulations in place	Fisheries and aquaculture policy & regulations.	2024-2029	Ministry of Agriculture
	Provide essential guiding principles for sustainable utilization and management of national fisheries for increased coherence and coordination in the sector	By 2029 fisheries and aquaculture sustainably & coherently utilized and managed	- A Guide to Sustainable & Coherent Fisheries Management - A Guide to Sustainable & Coherent Aquaculture	2024-2029	Ministry of Lands and Agriculture

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	Develop approaches, methodologies and technologies that will increase the profitability of environmentally and socially sound aquaculture to achieve continued sector growth	By 2027 approaches, methodologies and technologies for profitable aquaculture operational	Guide to Environmentally friendly & Profitable Aquaculture	2024-2027	Ministry of Agriculture
	Improve aquatic animal health surveillance under blue economy	By 2027 aquatic animal health surveillance in prevents diseases	aquatic animal health surveillance model	2024-2029	Ministry of Agriculture
3.0 Optimised utilisation of transportation and tourism in freshwater systems that enhances blue sustainability.					
	Develop transport linking main trade corridors from the sea-ports Botswana	By 2030 transport linkages with main trade corridors from the sea-ports operational	Transport linkages with main trade corridors from the sea-ports.	Dec 2024-March 2030	Ministry of Transport & Infrastructure
	Develop and Inland Waterways Policy	By 2026 inland waterways policy developed and adopted	Inland waterways policy	Dec 2024-March 2026	Ministry of Transport & Infrastructure
	Prevent and suppress national and transnational crime, including drug and human trafficking through the waterways	By March 2026 national and transnational crime through the waterways significantly reduced	• Establish baseline for transnational crime through the waterways • Significant reduction of national and transnational crime through the waterways	Dec 2024 – Jan. 2026 2024-2030	Ministry of Transport & Infrastructure; Ministry of Labour and Home Affairs; National Planning Commission
	Improve and harmonise robust water policy that reduce introduction of non-indigenous aquatic species.	By 2027 robust water policy reduces introduction of non-indigenous aquatic species	Robust water policy reduces introduction of	Dec2 024 March 2027	Ministry of Water Human Settlement and Ministry of Environment &

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
			non-indigenous aquatic species		Tourism
	Improve protection, valuation and communication of the country's cultural richness to enhance natural tourism	By March 2026 country's cultural richness to enhance natural tourism enhanced	Enhancement of country's cultural richness to enhance natural tourism	2024-2028	Ministry of Environment & Tourism & Ministry of Trade and Entrepreneurship
	Strengthen linkages between tourism and other production sectors in order to stimulate local entrepreneurship and job creation	By March 2026 strengthen linkages between tourism and other production sectors	Strengthened linkages between tourism and other production sectors	Dec 2024-March 2026	Ministry of Environment & Tourism
	Put in place strategies to make shore and lake/river-based tourism sustainable, resilient, addresses climate change, reduce pollution, supports ecosystem regeneration and biodiversity conservation	By March 2027 strategies to make shore and lake/river-based for sustainable, resilient tourism in place	Strategies to make shore and lake/river-based for sustainable, resilient tourism	Dec 2024-March 2027	Ministry of Environment & Tourism and Ministry of Water Human Settlement
	Mitigate against environmental degradation; water currents, erosion and sedimentation as a result of the reclamation for tourism.	By March 2030 environmental degradation; water currents, erosion and sedimentation as due to tourism reduced.	Reduced environmental degradation; water currents, erosion and sedimentation as due to tourism	Dec 2024-March 2030	Ministry of Environment & Tourism and Ministry Lands Agriculture
4.0 Enhanced innovative research and capacity building that is relevant to Blue Economy.					
	Identify and develop requisite skills, knowledge and technology for Blue Economy linked to sustainable development	By 2025 requisite skills, knowledge and technology for Blue Economy identified and developed	Requisite skills, knowledge and technology for Blue Economy identified and developed	2024-2025	Ministry of Higher Education and Ministry of Lands & Agriculture, Ministry of Communication & Innovation

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	Undertake biotechnology and bioprospecting to develop pharmaceuticals, nutraceuticals and food additives.	By 2030 biotechnology and bioprospecting able to develop pharmaceuticals, nutraceuticals and food additives.	Biotechnology and bioprospecting able to develop pharmaceuticals, nutraceuticals and food additives.	Dec 2024 March 2030	National Agricultural Research & Development Institute (NARDI) Academia (Public & Private Universities)
	Generate comprehensive knowledge and understanding of the aquatic ecosystems.	By 2030 comprehensive knowledge and understanding of the aquatic ecosystems in place	Comprehensive knowledge and understanding of the aquatic ecosystems	Dec 2024-March 2030	National Agricultural Research & Development Institute Public & Private Universities
	Promote Blue Bio-economy and biotechnology (life sciences, bio-economy, agri-food, bioenergy, microbial bioremediation) for commercial exploitation.	By 2030 Blue Bio-economy & biotechnology commercialised	Commercialisation of Bio-economy & biotechnology	2024-2030	Ministry of Agriculture and Ministry of Trade & Entrepreneurship, Ministry of Communications & Innovation
5.0 Increased contribution of renewable blue energy and sustainable extraction of aquatic mineral resources.					
	Put in place sufficient knowledge and regulations to ensure that any activity related to aquatic mining is informed by science and ecologically sustainable.	By 2030 activities related to aquatic mining is informed by science and ecologically sustainable.	Activities related to aquatic mining is informed by science and ecologically sustainable.	Dec 2024-March 2030	Ministry of Minerals & Energy and Ministry of Environment & Tourism
	Develop aquatic mining policy framework for Botswana [from Surface & Ground water].	By 2027 aquatic mining policy framework in place	Aquatic mining policy framework in place	2024-2027	Ministry of Mineral Development Botswana Geoscience Institute (BGI)
	Harmonise guidelines on geospatial information to guide	By 2028 guidelines on geospatial information to	Harmonised guidelines on	2024-2028	Ministry of Mineral Development

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	mineral prospecting and exploration [from Surface & Ground water].	guide mineral prospecting and exploration harmonised	geospatial information		
	Promotes sustainable development and management of Botswana's precious groundwater resources.	By 2028 guidelines on aquifer protection and safe disposal of hazardous waste developed	Guidelines on Aquifer Protection & Safe Disposal of hazardous waste	2024-2028	Botswana Geoscience Institute (BGI)
6.0 Improved environmental sustainability and ecological health of freshwater ecosystems.					
	Update a detailed and dynamic groundwater potential zone map to facilitate efficient water resources apportionment across different key water uses for socio-economic development.	By 2030 detailed and dynamic groundwater potential zone map in place	Detailed and dynamic groundwater potential zone map	Dec 2024-March 2030	Ministry of Lands & Agriculture, Water & Human Settlement Botswana Geoscience Institute (BGI)
	Develop Catchment Management Approaches towards improved watershed management and improved monitoring.	By 2028 Develop Catchment Management Approaches	Developed Catchment Management Approaches	Dec 2024-March 2028	Ministry of Lands & Agriculture, Ministry of Water & Human Settlement
	Strengthen institutional capacities (including at decentralized level), and promote sustainable utilities for better service delivery.	By Dec 2026 institutional capacities for sustainable utilities enhanced	Institutional capacities for sustainable utilities	2024-2028	Ministry of Minerals and Energy Ministry of Water and Human Settlement, Ministry of Communications & Innovation
	Implement measures to reduce nutrient eutrophication of water resources from development activities.	By March 2025 measures to reduce nutrient eutrophication of water resources implemented	Measures to reduce nutrient eutrophication of water resources	On-going	Ministry of Environment & Tourism, Ministry of Water & Human Settlement

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	Develop and implement water re-use strategies to reduce the impact of climate change on availability of freshwater.	By March 2027 water re-use strategies developed and implemented	Water re-use strategies in place	2024-2028 Dec 2024-March 2030	Department of Water Affairs
	Ensure adequately managed sanitation facilities for proper disposal wastewater to safeguard aquatic ecosystems.	By 2030 improved wastewater disposal facilities in place.	Wastewater disposal facilities in place	Dec 2024-March 2030	Ministry of Water & Human Settlement
7.0 To increase awareness and contribution of blue freshwater ecosystem services.					
	Develop and/or implement plans for prudent use of existing and planned reservoirs or dams on the country's rivers to enhance water, sanitation and hygiene (WASH), irrigation and renewable energy	By Dec 2027 plans for prudent use of existing and planned reservoirs operational Develop water allocation efficiency guidelines under the National IWRM Plan	Plans for prudent use of existing and planned reservoirs	Dec 2024-March 2027	Ministry of Water & Human Settlement Ministry Lands and Agriculture Department of Water Affairs (DWA)
	Implement collaborative plans for responsible exploits of the country's surface and groundwater (including MOUs on transboundary resources)	By March 2025 collaborative plans for responsible exploits of surface and groundwater	Collaborative plans for responsible exploits of surface and ground waters	Dec 2024 - March 2025	Ministry of Water & Human Settlement Ministry Lands and Agriculture
	Implement measures and harmonise strategies to reduce pollution of water resources from development activities	By Dec 2028 harmonised strategies to reduce pollution of water resources operational	Harmonised strategies for water resources pollution prevention and control	Dec 2024 - March 2028	Ministry of Environment & Tourism, Ministry of Water & Human Settlement

Result/Strategic Outcome	Interventions	Target	Indicator	Timeframe	Lead entity
	Develop technologies for renewable energy-based solid waste and wastewater treatment	By By Dec 2028 technologies for renewable energy-based solid waste and wastewater treatment operational	Technologies for renewable energy-based solid waste and wastewater treatment	Dec 2024 - March 2028	National Agricultural Research & Development Institute
	Strengthen monitoring research efforts to assess ecosystem health, identify threats and inform adaptive management strategies	By Dec 2027 monitoring of ecosystems research in place	Monitoring & Evaluation for ecosystems research strengthened	Dec 2024 – March 2027	National Agricultural Research & Development Institute, Department of Water Affairs (DWA) Academia
	Establish protected areas / aquaculture zones conservation reserves and list different categories of aquatic species to safeguard critical habitats and biodiversity	By Dec 2026 protected areas and conservation reserves established	Protected areas / aquaculture zones and conservation reserves	Dec 2024- March 2026	Ministry of Environment & Tourism, Ministry of Lands and Agriculture