Socio-Economic and Ecological Assessment of the Blue Economy in Tanzania

Application of UNECA'S Blue Economy Valuation Toolkit

United Nations
Economic Commission for Africa

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Abbreviations

	Description
AFDP	Agricultural and Fisheries Development Programme
AIMS	Africa Integrated Maritime Strategy
AU	African Union
BE	Blue Economy
BEVT	Blue Economy Valuation Toolkit
CCM	Chama Cha Mapinduzi
CICES	Common International Classification of Ecosystem Services
COVID-19	Coronavirus
DSFA	Deep Sea Fishing Authority
DWFNs	Distant Water Fishing Nations
EC	European Commission
EEZ	Exclusive Economic Zone
GDP	Gross Domestic Product
GHGs	Greenhouse Gas Emissions
GIS	Geographic Information Services
GNI	Gross National Income
GVA	Gross Value Added
HBS	Household Budget Survey
HDI	Human Development Index
IFAD	International Fund for Agricultural Development
ILFS	Integrated Labour Force Survey
IMF	International Monetary Fund
IOC	Indian Ocean Commission
IOC- UNESCO	Intergovernmental Oceanographic Commission - United Nations Education Science and Culture Organization
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
ISIC	International Standard Industrial Classification
IUCN	International Union for Conservation of Nature
IUU	Illegal, unreported, and unregulated fishing
LNG	Liquefied Natural Gas
LVFO	Lake Victoria Fisheries Organization
MNRT	Ministry of Natural Resources and Tourism
MPA	Marine Protected Area
MPRU	Marine Parks and Reserves Unit
MSP	Marine Spatial Plan

	Description
NBS	National Bureau of Statistics
NEMC	National Environment Management Council
NGO	Non-governmental Organization
NICEMS	National Integrated Coastal Environment Management Strategy
OCGS	Office of Chief Government Statistician, Zanzibar
PHC	Population and Housing Census
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SNA	System of National Accounts of the UN
SOAF	School of Aquatic Sciences and Fisheries Technology
SRO-EA	Sub-Regional Office of East Africa (UNECA)
SUTs	Supply Use Tables
SWIO	Southwest Indian Ocean
SWIOFish	World Bank South-West Indian Ocean Fisheries Governance and Shared Growth Project
TAFIRI	Tanzania Fisheries Research Organization
TNC	The Nature Conservancy
UDSM	University of Dar-es-Salaam
UN	United Nations
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
URT	United Republic of Tanzania
WCS	Wildlife Conservation Society
WIOMSA	Western Indian Ocean Marine Science Association
WWF	World Wildlife Fund
ZIPA	Zanzibar Investment Promotion Authority

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Executive Summary

The Blue Economy is one of the emerging strong pillars of socio-economic and ecological development and growth across the world. It is one of the few resource-base whose exploitation can be conducted sustainably, and also whose ecological protection can generate economic value. Yet, due to the vastness of its scope (related to lakes, rivers, seas, and wetlands) which makes it difficult to measure its value, the BE struggles to become a priority agenda for countries. In 2020, the United Nations Economic Commission for Africa (UNECA) developed a Blue Economy Valuation Toolkit (BEVT). This toolkit allows countries to assess the economic, social, and ecological value (in quantitative terms) that BE resources generate. Equipped with this information, countries can strategize on how best to optimise on these BE resources for enhanced socio-economic and ecological gains.

The United Republic of Tanzania requested UNECA for support to conduct a domestication of the toolkit, with the aim to understand the value that its BE resources generate, in support of national growth and development.

The BEVT was therefore applied to Mainland Tanzania, using the Supply Use Table data from 2015, obtained from the National Bureau of Statistics (NBS) of Mainland Tanzania. A tentative estimation of Zanzibar was also conducted, using data from the Supply Use Table 2015. The ecosystem valuation was done using a pool of data ranging from 2015 to 2020 sourced from National Environmental Research Agenda, 2017-2022.

The outcome of the BEVT assessment in Mainland Tanzania, and Zanzibar, with reference to the most recent adequate data available and inserted, is as follows :

- Blue Economy contributed to 11.9% of Mainland Tanzania's Gross Domestic Product (GDP), and 39.6% of Zanzibar's GDP in the year 2020.
- The wages that the BE generated in the year 2020 formed 9.9% of Gross National Income (GNI) in Mainland Tanzania, and 25.4% in Zanzibar.
- The values of ecosystem services were approximately USD 104.24 billion in the year 2020 for BE resources of Mainland Tanzania: 74.8% of which is generated by freshwater lakes. In the case of Zanzibar, the value of ecosystem services in 2020 was estimated at USD 100.76 billion, led by the contribution from coral reefs.
- The BE contributes positively to the social fabric of both Mainland Tanzania and Zanzibar, as indicated by its Composite Social Index Value which was 48.64 in 2020.

The recommendations of the report pertain to five key thematic, which include coordination, research and data collection, capacity-building, awareness, and policy development. The main recommendations are :

- Identification of a coordinating ministry for BE work, and nomination of a custodian of the BEVT
- Improve data collection for more comprehensive, updated, and disaggregated economic, ecological, and social data on BE activities
- Continuous training of officers on the BEVT to accommodate the BE evolution into a more multi-disciplinary subject
- Generate awareness about BEVT to all stakeholders

Some of the crucial policy changes advocated are :

- Official adoption of the BEVT as a tool supporting evidence-based policymaking and planning in the BE domain
- Development of BE-related higher education and skills development strategies
- Make coastal tourism more inclusive of local community
- Improve the mapping of the marine and freshwater ecological resources
- Development of national standards for an ecosystem approach for governance of migratory species
- Conduct a comprehensive accounting exercise of national BE resources
- Undertake a comprehensive assessment of the diverse BE schemes in order to address existing deficiencies and develop a sustainable and coordinated BE framework
- Development of a BE financing strategy and action plan
- Development of a comprehensive and inclusive National Blue Economy Strategy

Purpose of the Report

The Eastern Africa region comprises a total area of 5,723,653 km^2 of Exclusive Economic Zones (EEZ), 329,270 km^2 of continental shelf, and 3,497,527 km^2 of inland water bodies. In spite of its vast water resources, Africa only utilizes a minimal part--internal water bodies are mostly used for food, transport, and hydropower, and the EEZs as trade routes and for fishing. By expanding in other unexplored ocean-based sectors, such as cruise and coastal tourism, mineral exploration, aquatic renewable energy, and subsea communications networks, East Africa's Blue Economy (BE) industry has the capacity to become a strong pillar of growth and development in the region.

The growth and development spurred by the BE is not solely restricted to economic returns, but it also contributes to social as well as ecological benefits. For example, currently, the few active sub-sectors of the BE provide employment to almost four million East Africans (FAO, 2022). However, these jobs also contribute to a multitude of social benefits to the local communities through forward linkages. Likewise, the BE can also generate ecological benefits from sustainable fisheries to maritime renewable energies which are not only beneficial for current and future generations, but which could be used as sustainable means to raise international finance. Thus, development and diversification of the BE has the capacity to generate benefits at all fronts—economic, social as well as ecological—and for all demographic profiles.

In 2012, member States of the African Union (AU) adopted the 2050 Africa Integrated Maritime Strategy (AIMS) which seeks to act on the sustainable exploitation and protection of Africa's maritime domain for wealth creation. In 2016, UNECA developed the BE Policy Handbook which is a "step-by-step guide on how to mainstream the Blue Economy into continental, subregional, and national policies, plans, laws regulations, and practices for the development of African sustainable Blue Economy strategies". [1] Supported by these guiding initiatives, a few African countries have developed national BE strategies, such as Mauritius and Seychelles. Nonetheless, the BE sector still struggles as one of the lesser priority industries, often competing for focus and resources with other sectors. The fact that the BE is the least funded Sustainable Development Goal (SDG), occupying only 0.1% of total SDG funding even though oceans constitute 99% of the planet (Great Blue Wall Initiative, 2022), places this struggle into perspective.

In 2020, UNECA devised the Blue Economy Valuation Toolkit (BEVT), which complements the multisectoral approach and step-by-step methodology for policy development highlighted in the BE Policy Handbook for Africa. The BEVT provides countries with a tool to conduct quantified assessments of the socio-economic and ecological contribution of the BE to their respective growth and development. It allows us to capture the various dimensions of human interactions with our blue environment, including ocean, lakes, rivers, etc. Data entered in the toolkit determines the snapshot of the BE that will be produced. Disaggregated data provide a more accurate insight as it allows the toolkit to clearly establish percentage of correlation of the BE activity to any general sector of activity. Indicators used in the toolkit to measure BE contribution are benchmarked on the classifications and nomenclatures systems widely accepted among international experts, compatible with systems used nationally (System of National Accounts, Necessary Condition Analysis, System of Environment Economic Accounting etc.).

[1]-UNECA (2016). Africa's Blue Economy: A Policy Handbook. https://wedocs.unep.org/bitstream/handle/20.500.11822/30130/AfricasBlueEconomy.pdf?sequence=1&isAllowed=y

The three main dimensions that the toolkit focus on are listed below, along with their respective data sources :

Table 1 : **Dimensions of the Blue Economy Valuation Toolkit and their data sources**

	Dimensions Assessed in the BEVT	Indicators Used
1	Any economic activities associated with BE	International Standard Industrial Classification (ISIC) Nomenclature (Revision 4)
2	Any social dimension of human interaction with BE	Indexes from UNDP (Human Development Indexes such as (Gini coefficient, Multidimensional Poverty Index, Gender Inequality Index, etc.), World Bank and from other internationally recognized organizations
3	Any ecosystem services related to the BE	Urban Nature Index IUCN Habitats Classification Scheme (version 3.1) to describe each relevant Ecosystem and Common International Classification of Ecosystem Services or CICES or Nomenclature (version 5.1).

Source : Authors

The assessment produced by the toolkit allows a country to :

- Understand the extent to which its BE resources which are accounted for in the data entries (oceans, lakes, rivers, wetlands etc.), contribute to economic, social, and ecological development.
- Identify which BE sub-activity (for example, fisheries, tourism, agriculture etc.), generates more economic, social, and ecological return
- Identify the BE resources that are not being optimized
- Understand the value of the contribution of the BE to a country, and stimulate greater interest in the sector

Equipped with these evidence-based information about the BE, a country is empowered to formulate adequate policies and programmes, raise funds, and stimulate financing for related projects vis-à-vis international donors, and report on its progress.

Upon the request of the Government of United Republic of Tanzania (URT) in November 2021, Sub-Regional Office of East Africa (UNECA SRO-EA), commissioned a study for the domestication the BEVT in Tanzania. The aim of this domestication work is to conduct an economic, social, and ecological evaluation of the BE sector in the country.

Beyond a quantitative situational analysis of the BE in Tanzania, the report discusses the current and future socio-economic and ecological initiatives (by private or public stakeholders, civil society, or development partners) that may have a positive or negative impact on Tanzania's BE potential. In conclusion, the report provides policy recommendations, for the government to consider, as they develop a national BE policy.

INTRODUCTION

Introduction

Aquatic and marine resources are central to the delivery of the 2030 UN SDGs as well as to regional goals of the African Union (AU) such as the 2050 Africa's Integrated Maritime Strategy (AIMS) and Agenda 2063. Blue economy activities appeal to several SDGs, namely: SDG 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development; and SDG 13: Take urgent action to combat climate change and its impacts. While these are the directly impacted SDGs, BE further serves other SDGs indirectly. For example, the forward linkages from increased local investment in critical ecosystems are expected to support SDG 12 on Sustainable Consumption and Production, while improved and more stable incomes enable enterprising households and communities to tackle SDG 1, poverty; SDG 2, food insecurity; SDG 3, health; and SDG 4, education. It is also a sector which has engagement opportunities for all, thereby supporting SDG 8 which seeks to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Globally, the ocean economy has an asset base of over USD 24 trillion and generates at least USD 2.5 trillion each year from the combination of fishing and aquaculture, shipping, tourism, and other marine-based activities. [2] However, these are mere estimations, given that the full potential of aquatic and marine ecosystems and associated resources is still not well understood globally, and on the African continent. The lack of knowledge about blue resources at stake is a major gap which hinders policy development and implementation on the BE towards its sustainable harnessing. To this end, think-tanks and international organisations have been quick to devise accounting mechanisms to support work on the economic application of natural resources such as the BE resources. Some of these mechanisms are: Environment Satellite Accounting, Green Accounting, Natural Capital Accounting, Ecosystems Services Accounting, National Economic Accounting, etc. These systems allow countries to know the economic value or stock of their natural resources. United Nations Economic Commission for Africa's BEVT goes a step further and allows a socio-economic and ecological valuation of BE resources.

As a think-tank pioneering work on the BE in Africa, UNECA developed the BEVT which was tested in Djibouti and Seychelles and was validated in 2020. This toolkit complements the multisectoral approach and step-by-step methodology for policy development defined in the BE Policy Handbook for Africa. [3] It aims to guide sub-regional and national in-depth socio-economic assessments that will support informed decision-making. Since the BE represents a crucial and strategic entry point for economic diversification and post-Covid19 socio-economic recovery, member States need to elevate efforts in policy development and implementation. For informed decision-making, States need an accurate understanding of ecosystems and associated blue resources, as well as of the exact value of the BE sectors and their socio-economic and ecological contributions.

Blue economy activities are not new to the URT. Tourism, transport, and fisheries are critical marine, lake, and coastal activities, contributing to income and food security in the country. Unsurprisingly, the BE agenda has been prioritized by the government and several development partners in Tanzania. The Government of the URT committed to ensuring that the BE reaches its full potential and has indicated a desire to use investment in the BE as a strategy to accelerate its post-Covid19 recovery. These efforts would benefit directly from a thorough socio-economic and ecological valuation of their blue resources.

[2]-Worldwide Fund (2018). Sustainable Blue Economy Unpacked. https://www.wwfkenya.org/?229970/Sustainable-Blue-Economy-Unpacked

[3]-United Nations (2016). Africa's Blue Economy a Policy Handbook'. https://wedocs.unep.org/bitstream/handle/20.500.11822/30130/AfricasBlueEconomy.pdf?sequence=1&isAllowed=y

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DEVELOPMENT OF THE BLUE ECONOMY IN TANZANIA

1 Development of the Blue Economy in Tanzania

1.1 Understanding the Blue Economy Concept

The concept of "Blue Economy" was formulated during the "Rio+20" United Nations Conference on Sustainable Development held in Rio de Janeiro, 2012.[4] There, BE was espoused with the desired outcome of "improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities, endorsing low carbon, resource efficiency and social inclusion". [5] The "Rio+20" conference advocated BE as a new economic horizon for coastal states and for Small Island Developing States (SIDS). The same desired outcome from the BE was echoed in the United Nations Environment Programme (UNEP) of Green to Blue Economy[6], and also in the UNDP Global Centre for Public Service Excellence.[7]

While Rio's definition of the BE was restricted to Oceans and Seas, and therefore relevant only to coastal states and SIDs, in keeping with the topology of Africa, AU's AIMS includes lakes, rivers, and other internal water bodies of Africa in its maritime scope—given the expansive inland water bodies that exist on the continent. Thus, the applicability of the BE agenda to landlocked countries equally. "Africa's Maritime Domain (AMD)" refers to all areas and resources of, on, under, relating to, adjacent to, or bordering on an African sea, ocean, or African lakes, intra-coastal and inland navigable waterways, including all African maritime-related activities, infrastructure, cargo, vessels, and other means of conveyance. It also includes the air above the African seas, oceans, lakes, intra-coastal and inland navigable waterways and to the oceans' electromagnetic spectrum as well". [8]

The definition of the BE by the Indian Ocean Rim Association (IORA)[9] is slightly different in that it provides space for sustainable and innovative economic exploitation of BE resources. It defines BE as the integration of ocean economy development with the principles of social inclusion, environmental sustainability, and innovative, dynamic business models.

Amongst the different definitions, at the heart of the BE concept lie some basic ideas. They are:

- A separation of socio-economic development from environmental degradation. It emerges from a need to integrate conservation and sustainability in the management of the maritime domain for socio-economic gains. It can also be extended to include the protection and sustainable exploitation of the marine ecology or environment.
- The core idea of sustainability where inclusion of activities based on patterns of consumption and replenishment whilst generating lower or no greenhouse gas (GHG) emissions is key.
- The centrality of social inclusion based on the accessible nature of the BE resources and the wide scope of its appeal.

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[4]-Silver, J.J., Gray, N.J., Campbell, L.M., Fairbanks, L.W., Gruby, R.L. (2015). Blue economy and competing discourses in international oceans governance. J. Environ. Dev. 24 (2), 135–160. https://doi.org/10.1177/1070496515580797

[5]-See: https://sustainabledevelopment. un.org/content/documents/2978BEconcept.pdf

[6]-Steffen, J. (2012). IUCN Oceania Office, Green to Blue Economy, s.l.: IUCN. http://cmsdata. iucn.org/downloads/iucn_green_to_blue_economy.pdf

[7]-The UNDP Global Centre for Public Service Excellence defines the Blue Economy as follows: "Blue Economy is a marine-based economic development that leads to improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities".

[8]-United Nations Environment Programme (2015). Africa's Integrated Maritime Strategy 2050. https://wedocs.unep.org/bitstream/handle/20.500.11822/10924/%20oceangovernance_wg1_inf5_africa%27s_integrated_maritime_strategy_2050.pdf?isAllowed=y&sequence=1

[9] - See: https://www.iora.int/en/priorities-focus-areas/blue-economy

Given the current circumstances and the needs of a rapidly evolving and increasingly populous world, whose future resource base is in the oceans (for both humans and animals) the BE agenda has global relevance.

1.2 The Blue Economy Context

Blue Economy activities are not new to Tanzania. Tanzania has been engaging in domestic and international sea-based economic activities for centuries, and has, over the years, established a complex legal and policy framework to manage coastal and ocean resources, and to facilitate access to these resources in a sustainable manner, with a view of promoting economic growth.

When considering the range and scope of the policy and regulatory framework of BE in Tanzania, it should be noted that in Tanzania, BE is defined in line with AIMS 2050 and includes freshwater resources, including the lakes Victoria, Tanganyika, Nyasa, and Rukwa, rivers, wetlands, along with ocean and coastal ecosystems.[10]

Tanzania's legal and policy framework to manage coastal and ocean resources covers the geographic area extending from the EEZ to the coastal forests that are to be found inwards from the coastline, extending over 100 kilometres in some places, and which include a network of rivers and deltas that flow to the coast.

The five coastal regions of Mainland Tanzania namely, Tanga, Pwani, Dar es Salaam, Lindi, and Mtwara, cover about 15% of the country's total land area, and are home to approximately 25% of the country's population. According to national statistics, the five coastal regions contributed to about one-third of the national GDP in 2020, with Dar es Salaam leading with 28% of the GDP.[11] However, Lindi region is ranked nationally as being the poorest.[12]

(i) Mainland Tanzania

Tanzania has a coastal line of 1,424 km, a territorial sea of about 64,000 square kilometres, and 200-nautical-mile of EEZ area of 223,000 square kilometres (see Figure 1). The total inland water of the country covers about 6.5 percent of the total land area. Inland water resources in Tanzania include Lake Victoria (35,088 square kilometres), Lake Tanganyika (13,489 square kilometres), Lake Nyasa (5,760 square kilometres), Lake Rukwa (3,000 square kilometres), Lake Eyasi (1,000 square kilometres), and about 1,000 square kilometres of other small lakes, in addition to rivers and wetlands. Tanzania is endowed with diverse ocean, lakes, and rivers resources which lend to a variety of activities including fisheries, tourism, mariculture and aquaculture, energy production, ports, coastal transport, and coastal mining. These possess enormous potential for regional cooperation on BE.[13]

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[10]-Seeteram, Nadia A., Pendo T. Hyera, Lulu T. Kaaya, Makarius C. S. Lalika, and Elizabeth P. Anderson (2019). Conserving Rivers and Their Biodiversity in Tanzania. Water 11, no. 12: 2612. https://doi.org/10.3390/w11122612

[11]-National Bureau of Statistics and Ministry of Finance, National Accounts of Tanzania Mainland 2014-2020. Available from: https://www.nbs.go.tz/index.php/en/census-surveys/national-accounts-statistics/na-statistics-by-subject

[12]-National Bureau of Statistics (2020). Tanzania Mainland Household Budget Survey 2017/18: Final Report. Dodoma: Ministry of Finance and Planning, National Bureau of Statistics Dodoma. https://www.nbs.go.tz/nbs/takwimu/hbs/Household_Budget_Survey_2017-18-Tanzania_Mainland.zip

[13]-Mfamau (2019). Blue Economy in Zanzibar: Policies and Priorities.

In Tanzania, the fisheries industry is a major node of economic activity. Located in the African Great Lake region, the country has abundant fishery resources.[14] Tanzanian EEZ lies within the richest tuna belt of the Southwest Indian Ocean (SWIO).[15] According to World Bank estimation, tuna fishery in the Tanzanian marine waters provides around 0.9 percent of the SWIO region's tuna production.[16] Fisheries contribute to Tanzania's economy both in terms of income and employment. The sector is responsible for over 180,000 jobs,[17] while 4.5 million people indirectly depend on fishery activities on the Mainland.[18] The sector contributes about 1.7% to the country's GDP.[19]

Nonetheless, the country is yet to fully benefit from this valuable resource. In terms of fisheries, the exploitation of EEZs is highly dependent on foreign fleets. The revenues from licensing vessels are marginal, when compared to the value and the growing global demand for harvested tuna and tuna-like species. "Access license fees from foreign fishing generated USD 5.4 million in 2015-2018. [20] Comparatively, the total annual potential catch of tuna in the Tanzanian EEZ by Distant Water Fishing Nations (DWFNs) in recent years has reached more than 8,000 metric tonnes, with a landed value of USD 16 million". [21]

This is the only economic activity, whose input and output are directly traceable to BE resources, and on which disaggregated data is available. All remaining activities are subject to various degrees of separation in their contribution to the BE. [22]

Tourism too, is a key sector contributing to Tanzania's economic growth. [23] In 2019, the tourism sector was the second-largest component of Mainland Tanzania's GDP, with a contribution of 17%. In terms of employment, the sector is the third-largest source of employment, with 850,000 workers.[24] Nonetheless, the share of coastal tourism out of the total activity is not measurable.

Oil and gas are the next sectors that can boost the Tanzanian economy. Tanzania's natural gas reserves were estimated at 57.54 trillion cubic feet.[25] In 2020, the contribution of the mining and quarrying sectors (inclusive of oil and natural gas) to the GDP was 6.7%.[26]

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[14]-Ministry of Livestock and Fisheries (2021). The annual fisheries statistics report (January–December). Dodoma, Tanzania: MLF

[15]-See: https://wwf.panda.org/wwf_news/?227994/Tanzania-tuna-fisheries-worth-millions-but-underexploited

[16]-Lallemand, Ph. (2019). Study on Tuna Fisheries Direct and Indirect Contribution to GDP and Wealth Distribution Patterns in the SWIOFC. Member Countries. AFCC2/RI-SWIOFISH PROJECT 1 P132123. https://www.commissionoceanindien.org/wp-content/uploads/2021/04/Final-Report-Tuna-Contribution-to-GDP-in-SWIOFC-by-P.-Lallemand-November-2019-1_18Feb2020.pdf

[17]-Peart J., Tran N, Chan C., Maskaeva A., Shoko A., Kimirei I. and Madalla N. (2021). A review of fish supply–demand in Tanzania. Penang, Malaysia: WorldFish. Program Report: 2021-32. https://digitalarchive.worldfishcenter.org/bitstream/handle/20.500.12348/5115/a8a0374ca750f607469af6e05298bb91.pdf?sequence=2&isAllowed=y

[18]-Ministry of Livestock and Fisheries (2021). The annual fisheries statistics report (January–December). Dodoma, Tanzania: MLF

[19]-National Bureau of Statistics and Ministry of Finance, National Accounts of Tanzania Mainland 2014-2020. Available from: https://www.nbs.go.tz/index.php/en/census-surveys/national-accounts-statistics/na-statistics-by-subject

[20]-Deep Sea Fishing Authority (2022). Economic modeling of sustainable tuna ans tuna-like species in Tanzania. SWIO-WB Project report

[21]-DSFA (2019). United Republic of Tanzania National Report to the Scientific Committee of the Indian Ocean Tuna Commission. IOTC-2019-SC22-NR28. https://www.iotc.org/documents/SC/22/NR28

[22]-This degree of separation which can assess the percentage to which a distant activity, for example, construction, contributes to the Blue Economy sector can be measured through a Satellite Account assessment

[23]-Wade, D., Mwasaga, B., & Eagles, P. (2001). A history and market analysis of tourism in Tanzania. Tourism Management, 22, 93–101.

[24]-World Bank (2021). Transforming tourism: Toward a sustainable, resilient, and inclusive sector. The World Bank Group. http://documents.worldbank.org/curated/en/794611627497650414/Transforming-Tourism-Toward-a-Sustainable-Resilient-and-In clusive-Sector

[25]-NBS (2018). National Environment Statistics Report for 2017: Tanzania Mainland. https://www.nbs.go.tz/nbs/takwimu/Environment/NESR_2017.pdf

[26]-https://www.nbs.go.tz/nbs/takwimu/na/National_Accounts_of_Mainland_Tanzania_2020.pdf

In 2022, URT Government and global energy and petroleum refining companies, signed a preliminary agreement of USD 30 billion for a Liquefied Natural Gas (LNG) project.[27] It is estimated that after completion of this LNG project, the domestic production of natural gas could potentially increase Tanzania's GDP by USD 7 billion per annum.[28]

(ii) Zanzibar

In Zanzibar, oceans and seas are the sole BE resources of the island. Blue Economy is important to Zanzibar because of the scope of activities included under its umbrella: small-scale fisheries, aquaculture, deep-sea fishing, tourism, a potential for offshore renewable energy, and on-going exploration activities on oil and gas.[29]

Ocean-based activities contribute over 29% to Zanzibar's GDP and employ around 33% of labour force.[30] Zanzibar's tourism sector accounts for 27% of country's GDP, and over 80% of foreign currency earnings. It employs over 75,000 people. Zanzibar's tourism industry is the leading private sector job creator and is one of the fastest growing industries in Zanzibar. The industry has attracted more than 68% of investment projects approved by Zanzibar Investment Promotion Authority (ZIPA). [31]

Figure 1 : **Geographical Context of the United Republic of Tanzania**

URT has a Territorial Sea of 64,000 km2 and an Exclusive Economic Zone (EEZ) of 223,000 km^2. The country's continental shelf is about 17,900 km^2 in area, with a 1,400 km coastline. The archipelago of Zanzibar, which consists of the two main islands of Unguja and Pemba along with smaller neighbouring islands, is a semi-autonomous region within the country. Zanzibar is separated from the coast of Mainland by a 22-mile channel.

[27]-https://www.tanzaniainvest.com/energy/lng-project-report
[28]-Tanzania LNG: A Macroeconomic Study https://www.stanbicbank.co.tz/static_file/tanzania/Common%20Content/Downloadable%20Files/LNG_MacroReport.pdf
[29]-Zanzibar Planning Commission (2020). Zanzibar Blue Economy Policy. http://extwprlegs1.fao.org/docs/pdf/tan208265.pdf
[30]-Zanzibar Planning Commission (2020). Zanzibar Blue Economy Policy. http://extwprlegs1.fao.org/docs/pdf/tan208265.pdf
[31]-Zanzibar Commission for Tourism. http://www.zanzibartourism.go.tz

1.3 The Blue Economy Framework

The impetus for BE development in Tanzania is driven by Presidents of both sides of the Union. Their vision is supported by a series of strategic documents which guide the works and create conducive policy climate for BE development. Listed below are the key documents of the BE framework of Mainland Tanzania's and Zanzibar's.

(i) Mainland Tanzania

Blue Economy was highlighted as a priority sector for Mainland Tanzania. The key documents which communicate the BE emphasis are:

1. Tanzania Development Vision (TDV) 2025: This strategy document which defines the path for Tanzania to become a middle-income country, highlights the need to strengthen the management of inland and marine coastal aquatic resources in order to support an environmentally sustainable economic development.

2. The Chama Cha Mapinduzi (CCM) Election Manifesto 2020-2025:[32] This is the electoral manifesto of the ruling party of URT. The manifesto aspires to create jobs, transform the economy, and drive innovation by harnessing various resources, including BE.

   Key policy goals and priorities relating to the BE identified in the CCM Manifesto 2020-2025 are the following :

   - Transforming agriculture, livestock and fisheries to ensure food security and self-reliance in food at all times and contribute fully to economic development;
   - Encourage the use of research, science, technology, and innovation as a tool for rapid socio-economic development;
   - Continue to create an enabling environment for the private sector to grow and prosper as well as attract investors to make a meaningful contribution to the development of our country;
   - Increase the benefits that the country receives from natural resources and the wealth of the country by strengthening the management of production contracts and building internal capacity to harvest and process such resources;
   - Strengthen the management and conservation of the environment and the ability to respond to the effects of climate change;
   - Ensuring increased production in food, animal husbandry and fisheries for food security and nutrition;
   - Increasing productivity in agriculture, livestock and fisheries to stimulate economic development especially in the manufacturing and services sectors;
   - Strengthening and revitalizing research, science, technology and technical institutions so that they can design resources to increase productivity in the production and service sectors;
   - Stimulating economic growth, especially in the industrial sector that uses agricultural, livestock, fisheries, mining and natural resources and sectors of economic services, including tourism;

[32]-National Executive Committee of the United Republic of Tanzania (2020). Summary of the CCM Election Manifesto 2020-2025. https://afisikuu.ccm.or.tz/website/ilani/Ilani%20CCM%20English.pdf

Enabling young people to participate in entrepreneurial activities, including providing them with training and linking them with organisation and institutions offering loans with low interest and concessional terms.

The CCM manifesto is in line with the Policy Vision of Chama Cha Mapinduzi of 2020-2030, the Tanzania Development Vision 2025, and the Zanzibar Development Vision 2020-2050.

3. Other policy documents and frameworks that support implementation of the BE, including standard business regulation, trade and investment promotion, sectoral frameworks for the protection and conservation of BE resources, amongst others.

In 2021, at the State of Nation address of the incoming President, the URT Government defined the following key policy commitments relevant to BE :

- Purchase of eight boats to promote deep-sea fishing in Mainland Tanzania and Zanzibar, with support from International Fund for Agricultural Development (IFAD);
- Improve fishing infrastructure by constructing a special port for deep-sea fishing vessels, improve licensing procedures for deep-sea fishing and, facilitate access to modern fishing equipment as well as establish industries for fish processing and other sea products;
- Improve governance of the EEZ in order to allow the country to benefit from its ocean resources;
- Enhance tourism opportunities through investments in tourism attractions along the coast, among other areas, in order to attract more tourist boats, encourage investors to invest in various tourist opportunities including hotels, and increase tourism products while reducing associated costs;
- Continue efforts to address the impact of climate change including by promoting use of renewable energy to generate 1100 Mw from geothermal and solar power by 2025;
- Prioritize implementation of the Paris Agreement through Nationally Determined Contributions (NDC) in key sectors, including fishing, disaster risk reduction, in order to enhance countries' resilience against climate change. [33]

The Ministry of Finance and Planning is currently working on the development of a National Blue Economy Strategy. The draft strategy is expected to be circulated for broader stakeholder review and consultations before endorsement by the government by end of 2022. The National Blue Economy Strategy will move from a sector-by-sector approach to development planning towards a more integrated and holistic framework that will facilitate harmonisation and coordination on the BE agenda. It should be noted, that although the National Blue Economy Strategy will cover the entire country, activities will focus specifically on relevant coastal and marine areas.

The National Blue Economy Strategy will build upon and establish synergies between a number of key sectoral policies that form integral pillars of the strategy. They include :

- The National Environment Policy and its Implementation Strategy (2021)
- The National Climate Change Response Strategy and its Implementation Plan (2021)
- The Nationally Determined Contribution (2021) and its Implementation Plan (2021)
- The Fisheries Policy (2015)

[33]-Tanzania's nationally determined contribution (NDC) provides a set of interventions on adaptation and mitigation, which are expected to build country resilience to the impacts of climate change and contribute to the global effort of reducing greenhouse gases (GHG) emission.

- The National Forest Policy (1998), and its Implementation Strategy (2021)
- The National Tourism Policy (1999), together with a comprehensive COVID-19 Recovery and Sustainability Plan for Tourism Sector in Tanzania 2020/21-2024/25
- The National Integrated Coastal Environmental Management Strategy (2003), and
- The National Disaster Management Policy (2004), amongst others.

Entities and activities in Mainland Tanzania's BE space are further governed by the following government regulations, amongst others:

- Agriculture Policy (2013)
- Fisheries Policy (2015)
- Environmental Management Act (2017)
- National Environment Policy (2021)
- National Energy Policy (2015)

(ii) Zanzibar

Likewise, the BE agenda became a top policy priority for Zanzibar in 2020. The strategic documents framing the work that Zanzibar initiated under the BE are :

1. Chama Cha Mapinduzi (CCM) Election Manifesto 2020-2025.
2. The Zanzibar Development Vision 2050 : [34]The overarching goal stated in the document is to lift Zanzibar economically and socially in order to attain upper middle-income status by 2050.
3. The Zanzibar Blue Economy Policy 2020 : [35] This is a 10-year sectoral plan set for implementation over a 10 year period is the guiding framework for the implementation of a sea-based economy.
4. Zanzibar Strategy for Growth and Reduction of Poverty III (ZSGRP) (MKUZA III) : [36] This document aims for sustainable and inclusive growth, human capital development, quality services, environmental sustainability, climate resilience, and good governance in Zanzibar. It makes provision for working towards SDGs.

Entities and activities in the Zanzibar BE space are further governed by the following regulations, amongst others :

- Zanzibar Environmental Policy (2013)
- National Land Policy of Zanzibar (2018)
- National Forest Policy for Zanzibar (1996)
- Zanzibar Energy Policy (2009)
- Zanzibar Industrial Policy (2019)
- Zanzibar Investment Policy (2005)
- Zanzibar Livestock Policy (2009)
- Zanzibar Tourism Policy (2018)
- Zanzibar National Water Policy (2004)
- Zanzibar Oil and Gas (Upstream) Act (2016)

[34]-Revolutionary Govrnment of Zanzibar (2020). Zanzibar Development Vision 2050. http://extwprlegs1.fao.org/docs/pdf/tan205723.pdf
[35]-Zanzibar Planning Commission (2020). Zanzibar Blue Economy Policy. http://extwprlegs1.fao.org/docs/pdf/tan208265.pdf
[36]-Zanzibar (2017). Zanzibar strategy for growth and reduction of poverty ZSGRP III, (MKUZA III), 2016-2020.

The Government of Tanzania and the Revolutionary Government of Zanzibar continue the work to improve policies and strategies to ensure sustainable utilization of marine resources in order to realize the BE agenda. The country is opened for investment in diverse sectors of the BE, including deep-sea fishing, ports infrastructure, marine transport, petroleum and gas, and tourism.

1.4 International Support on the Blue Economy

Nowadays, Mainland Tanzania is doubling efforts to engage into marine scientific research, bioprospecting, enhancing port infrastructure, and mechanizing industrial processing facilities for fisheries and aquaculture.[37] On the other hand, Zanzibar's key priority areas for BE remain tourism, fisheries, aquaculture and maritime transport.

International donors have been supporting them in these areas for almost two decades now. For example: United States Agency for International Development (USAID) has supported coastal district planning and the development of the National Integrated Coastal Environment Management Strategy (NICEMS) in Mainland Tanzania. It was officially adopted in December 2003. The European Commission (EC) has concentrated on strengthening URT's capacity in the monitoring, control and surveillance of the country's EEZ by providing technical assistance and equipment to facilitate offshore management. Numerous donors and non-governmental organizations (NGOs) - World Wildlife Fund (WWF), the International Union for Conservation of Nature (IUCN), Ireland, Norway, Finland, Sweden are providing site-specific support for the management of Marine Protected Areas (MPAs) along the coast, including a wide spectrum of ecosystems on the Mainland and on the Zanzibar islands.

Norway is currently supporting Zanzibar to establish the Marine Spatial Planning (MSP) framework. It is also receiving help from different NGOs such as Western Indian Ocean Marine Science Association (WIOMSA), WWF, International Monetary Fund (IMF), United Nations Women (UN), and USAID, along with collaborative support from country offices of organisations present in Tanzania such as The Nature Conservancy (TNC) and United Nations development Program (UNDP) Tanzania.

Furthermore, there are countries which have bilaterally committed to support BE in Mainland Tanzania and Zanzibar.

- From 2010 to 2020, France supported different projects in the URT to the tune of EURO 590 million under a soft loan agreement. This was directed towards support on improvement and construction of roads, bridges, airports, water, energy, education, agriculture, natural resources, tourism, culture, and environment protection. Additionally, France has invested in 40 projects in Tanzania, valued at USD 167.7billion which is estimated to have created 1,885 employments in energy, transportation, and construction industry sectors.
- France, again, through Agence Francaise de Development, has dispatched BE experts to support the Ministry of Blue Economy and Fisheries in Zanzibar to implement its strategic priorities.
- Ireland has supported the establishment of the Tanzania's version of the Great Blue Wall Initiative, known as the Tanga-Pemba Seascape, implemented by the International Union for Conservation of Nature (IUCN).

[37]-Nairobi Convension (2022). Blazing a Way Forward on Zanzibar's Blue Economy:A Conversation with Aboud Jumbe, Principal Secretary of Zanzibar's Ministry of Blue Economy. https://www.nairobiconvention.org/blazing-a-way-forward-on-zanzibars-blue-economy/

- Germany has also committed to support Zanzibar's BE agenda though protection and conservation of marine biodiversity.
- In 2020, the Korea-Zanzibar Friendship Hatchery Centre was launched to diversify the aquaculture sector through a training programme. This will facilitate the farming of mariculture species.

Other development partners' support came as follows :

- The IMF, through its post-Covid19 Recovery Fund, approved USD 567 million for Tanzania in September 2021. Of that, roughly USD 100 million is coming to Zanzibar. Around USD 15 million of this total will be diverted to BE sectors such as small-scale fisheries, sea cucumber and seaweed farming, mud crab fattening, amongst others.
- The European Union (EU) is already on the applying the EU Green Deal approach to support the BE in Tanzania.
- WIOMSA is currently supporting a Blue Economy Value Chains study implemented by Technoserve.
- USAID has already committed to support Zanzibar with accessible and sustainable BE financing systems.
- The World Bank funded the "South-west Indian Ocean Fisheries Governance and Shared Growth Project" through the South-west Indian Ocean Fisheries (SWIOFish) thus promoting tuna fishing in Tanzania. The SWIOFish project, through Deep Sea Fishing Authority (DSFA) and WIOMSA, funded several projects which research on tuna and tuna-like species. This project is one of the many projects that received funds from SWIO-Fish.

1.5 The Institutional Support Structure of Blue Economy

Given the multisectoral nature of the BE industry, and its engagement with a wide nature of resources and stakeholders, it is crucial that countries have dedicated departments or institutions to support the coordinated implementation of the BE agenda.

(i) Mainland Tanzania

The issue of BE coordination in Mainland Tanzania is currently under Government consideration. The responsibility for coordination and facilitation of the development of the BE strategy in Mainland Tanzania was initially under the Vice-President's Office. Following the recommendations from the 2020 edition of the African Economic Conference (UNECA conference), this responsibility was shifted to the Ministry of Finance and Planning. The Ministry of Finance and Planning is assisted technically by a Special Task Force--the National Blue Economy Task Force--comprised of members from other key technical departments, including the Division of Environment in the Vice President's Office. Other Ministries represented in the Task Force include: the Department of Fisheries of the Ministry of Natural Resources and Tourism (MNRT), the National Environment Management Council (NEMC), the Marine Parks and Reserves Unit (MPRU), the Ministry of Natural Resources and Tourism (MNRT), the Ministry of Water and Irrigation, the Ministry of Lands, Housing and Human Settlements and the Land Use Planning Commission, and the Tanzania Fisheries Research Institute (TAFIRI).

(ii) Zanzibar

Like Mainland Tanzania, the institutional set up in Zanzibar is largely based on a civil structure which includes ministries as well as divisions and departments dealing with different sub-sectors of marine and coastal ecosystems. Following its Blue Economy Policy in 2020, the Revolutionary Government of Zanzibar established the Ministry of Blue Economy and Fisheries, solidifying its commitment to a long-running relationship of care for both the ocean environment and the people of Zanzibar who depend on the ocean for food and income.

Over the past two years, the ministry has worked on enhancing public awareness and understanding of the BE, as well as building individual and institutional capacity. In addition to that, it aims at working on innovative ways to help different BE sectors to access capital. For example, under the Post-Covid-19 Blue Economy Recovery Plan, they successfully convinced and mobilized local banks in Tanzania to open-up to BE micro-entrepreneurship. Furthermore, the ministry is developing access to markets for blue bio-trade products such as fish, anchovies, octopus, sea cucumber, mud crabs, and seaweed.

The Ministry of Blue Economy and Fisheries is the major institution responsible for coordination and facilitation of the BE agenda in Zanzibar. It leads the development of BE architecture, including development of the BE policy and its strategic plan for implementation. The Ministry is also responsible for monitoring, evaluation, and reporting to Cabinet, the House of Representatives, private stakeholders and to the general populace. It furthermore oversees the protection and management of all marine conservation areas in Zanzibar.

In order to achieve this mandate, the Ministry has organized itself into strategic departments. The Department of Blue Economy Development and Coordination is mandated to provide the central coordinating mechanism for steering and oversight purposes. This department focuses particularly on cross-cutting strategies and projects.

Other key ministries for BE work in Zanzibar include those responsible for: Finance and Planning, Environment, Water, Energy, Tourism, Agriculture, Irrigation and Livestock, Trade, Industries and Markets Gender, Local Government Authorities, and Maritime Transport and Infrastructure.

2

THE **BLUE ECONOMY VALUATION TOOLKIT** AND **DATA ENTRIES**

2 The Blue Economy Valuation Toolkit and Data Entries

The BEVT is a toolkit that allows to capture the various dimensions of human interactions with our blue environment, including ocean, lakes, rivers, wetlands and others. It can record the various types of benefits people gained from it. The three main dimensions that the toolkit focuses on are :

- Any economic activities associated with the BE
- Any social dimension of human interaction with BE, and
- Any ecosystem services related to the BE

The toolkit is flexible and comprehensive enough to represent any country--coastal, insular, or landlocked. Data entered in the toolkit determines the snapshot of the BE that will be produced. It therefore supports the use of the most recent disaggregated national data, usually that at ISCI Level 2.[38]

Indicators used in the toolkit to measure BE contribution is benchmarked on the classifications and nomenclatures systems widely accepted among international experts and compatible with systems used nationally (System of National Accounts, Necessary Condition Analysis, System of Environment Economic Accounting etc.). These are:

- For measuring economic activities: International Standard Industrial Classification or ISIC Nomenclature (revision 4)
- For measuring social dimensions: Indexes from UNDP (Human Development Indexes such as (Gini coefficient, Multidimensional Poverty Index, Gender Inequality Index, etc.), World Bank and from other internationally recognized organizations
- For measuring ecosystem services: Urban Nature Index (IUCN) Habitats Classification Scheme (version 3.1) to describe each relevant Ecosystem and Common International Classification of Ecosystem Services or CICES Nomenclature (version 5.1).

In order to facilitate the comparison and the consolidation of the collected data in each of the three modules, the BEVT includes a utility facility composed of historical exchange rates for each country going back 10 years and a table of deflators by country covering the same period. The facility also stores basic information on each country's physical and geographic characteristics, (flags, national currency, GDP).

The BEVT does draw on online sources and relies on pivot tables. As such, any errors in the summary data produced at the end of the assessment, will be consequence of any likely input errors.

[38]-ISIC level 1 is a broad structure which includes 21 sectors. ISIC level 2 is a standard intermediate-level aggregation of 38 ISIC categories for internationally comparable System of National Accounts data.

3

BLUE ECONOMY DATA AND ITS GAPS

3 Blue Economy Data and its Gaps

An application of the BEVT to Mainland Tanzania and Zanzibar, for an assessment of the social, economic, and ecological contribution of the BE to the national outputs, requires quantitative data entries. The more recent and disaggregated the data entries, the more accurate and up-dated is the snapshot of BE contribution generated.

Therefore, in an attempt to capture the most recent and most reliable data for input into the BEVT, this study relied extensively on data from the National Accounts (NA).

3.1 National Accounts

The National Bureau of Statistics (NBS) and the Office of Chief Government Statistician (OCGS) are the two agencies which act as repositories of National Accounts in Mainland Tanzania and Zanzibar, respectively.

The National Accounts statistics are based on the concepts, definitions and classification prescribed in the United Nations' System of National Accounts (SNA) of 1953, 1968 and 1993. Six rounds of revisions have been done since the first compilation of national accounts statistics in 1954.

The history of National Accounts compilation in Mainland Tanzania dates to the year 1954. The first revision of National Accounts statistics in Tanzania was done for the year 1966 and based on the 1953 SNA, while the sixth and last revision was conducted in the year 2015, based on the 2008 SNA. [39]

National Accounts represent output, expenditure, and income activities of the economic actors (households, firms, government) in an economy, including their relations with rest of the world. The composition of National Accounts include the following elements:

- Production account (components of gross output);
- Primary distribution of income account (incomes generated by production);
- Transfers (redistribution) account (including social spending);
- Household expenditure account;
- Capital account;
- Domestic financial transactions account;
- Changes in asset values account;
- Assets and liabilities account (balance sheet);
- External transactions account (balance of payments).

Revised National Accounts statistics having the base year 2015 in Tanzania adopted the production and expenditure approaches.[40] The production and expenditure approaches are used in Mainland Tanzania and Zanzibar as the information required for compilation of GDP using these approaches are dependable and readily available.[41]

[39]-See: https://www.nbs.go.tz/nbs/takwimu/na/Revised_National_Accounts_BASE_YEAR_2015.pdf

[40]-The production approach measures the Value-added at each level of production, where value-added is defined as the difference between total sales less the value of intermediate inputs into the production process during an accounting period. The expenditure approach takes into account the sum of all final goods and services purchased in an economy over a given period of time.

[41]-NBS (2019). The revised national accounts statistics for Mainland Tanzania, base year 2015: sources and methods. National Bureau of Statistics, Ministry of Finance and Planning, Dodoma, 2019

National accounting disaggregated to ISCI level 1 (excluding the agricultural sector which is disaggregated to ISIC level 2) to allow for accounting of BE activities is still in its infancy in both Mainland Tanzania and Zanzibar. The annual national accounts reports are available under open access on the NBS webpage[42] are restricted to the ISIC[43] level 1[44] (see Table 1 and 2).

3.2 Supply and Use Tables

In 2015, NBS of Mainland Tanzania, and OCGS of Zanzibar, developed Supply and Use Tables (SUTs) to support their national accounting system. Supply and Use Table is the internationally recommended framework consistent with the System of National Accounts used for the benchmarking of GDP by production, expenditure, and income approaches. SUTs consist of two interlinked tables:

- The Supply Table
- The Use Table

The Supply Table describes how goods and services become available in an economy during a certain period of time. Products are either produced in the domestic industry or imported.

The Use Table shows how goods and services are used in the economy during a certain period of time. Products can be used either as intermediate consumption or as final use.

The SUTs are used to improve the accuracy of value-added and GDP estimates, as well as provide a more accurate overview of the economy in terms of industry players and structure. Using the Supply-Use framework, BE identifies the activities responsible for producing goods and services and measures the output, value added, compensation, and employment associated with their production. The latest SUTs available in Mainland Tanzania and Zanzibar date to 2015.

3.2.1 Illustration of National Account Data ISIC Level 1 Applied to GDP analysis of Blue Economy -related Sectors

Based on the National Accounts data available, Table 1 and 2 below present Mainland Tanzania's and Zanzibar's GDP by activity at current prices for the years 2014 – 2018 and 2012-2017, respectively. The tables indicate all the industries that are present in both economies.

However, as data from National Accounts are at the highest level (level 1) of aggregation in Table 1 and 2, consequently, identifying the relevant BE industries and ascribing the relevant value added to the BEVT would result in an overstatement of the BE in Mainland Tanzania and Zanzibar.

[42]-https://www.nbs.go.tz/index.php/en/census-surveys/national-accounts-statistics/na-statistics-by-subject

[43] - United Nation (2008). International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, ST/ESA/STAT/SER.M/4/Rev.4. Department of Economic and Social Affairs, Statistics Division. New York: United Nations Statistical papers

[44]-United Nation (2008). International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, ST/ESA/STAT/SER.M/4/Rev.4. Department of Economic and Social Affairs, Statistics Division. New York: United Nations Statistical papers.
ISIC is the international reference classification of productive activities. ISIC classifies entities by activity. It provides a set of activity categories that can be utilized for the collection and reporting of statistics. ISIC is organised around 4 hierarchical levels. They are (i) Sections, (ii) Divisions, (iii) Groups, and (iv) Classes. Sections are also referred to ISIC level 1 as they form the first level of categorization. There are 21 Sections labelled from A to U.

Table 2 : **Tanzania Gross Domestic Product by activities at Current Market Prices (TZS billions)**

Application of data disaggregated at ISIC level 1

Economic Activity	2012	2013	2014	2015	2016	2017	2018
A: Agriculture, Forestry and Fishing	**16,546,181**	**19,551,225**	**21,313,803**	**25,234,560**	**29,739,111**	**34,154,594**	**36,539,300**
Crops	8,797,362	10,500,528	11,562,090	13,279,392	16,474,729	19,703,004	20,969,477
Livestock	4,633,266	5,579,312	5,585,211	7,158,457	8,205,007	8,857,939	9,850,934
Forestry	1,736,757	2,069,113	2,477,897	2,920,425	3,094,767	3,310,076	3,459,581
Fishing	1,353,297	1,375,790	1,658,605	1,843,401	1,929,747	2,245,558	2,218,731
Agriculture Support services	25,499	26,483	30,000	32,886	34,861	38,017	40,577
Industry and Construction	**15,828,627**	**18,570,322**	**20,767,734**	**23,103,647**	**26,937,139**	**29,735,584**	**34,732,007**
B : Mining and quarrying	3,071,558	3,125,480	3,097,933	4,055,619	5,299,362	5,206,217	6,573,059
C : Manufacturing	5,881,780	6,648,876	7,533,519	7,411,672	8,467,126	9,102,282	10,418,295
D : Electricity supply	522,829	550,300	818,693	798,801	472,868	413,351	348,527
E : Water supply; sewerage, waste	279,326	324,028	371,581	390,758	433,132	519,909	566,562
F : Construction	6,073,134	7,921,637	8,946,007	10,446,797	12,264,650	14,493,826	16,825,564
Services	**25,308,528**	**29,384,671**	**34,111,643**	**38,146,529**	**42,747,407**	**45,066,596**	**47,923,308**
G : Wholesale and retail trade; repairs	6,448,378	7,063,673	8,045,702	8,747,862	9,861,678	10,843,499	11,792,072
H : Transport and storage	3,747,784	5,246,333	6,167,366	6,929,895	7,549,484	7,897,993	8,381,276
I : Accomodation and Food Services	1,253,970	1,317,191	1,330,371	1,421,916	1,523,035	1,602,543	1,653,792
J : Information and communication	1,282,255	1,433,179	1,598,597	1,681,098	1,739,556	1,829,360	1,948,116
K : Financial and insurance activities	2,561,997	2,541,198	3,614,991	4,189,021	5,268,866	4,789,632	4,823,650
L : Real estate	2,308,221	2,551,029	2,721,061	2,949,598	3,162,290	3,334,171	3,553,630
M : Professional, scientific and technical activities	282,744	353,038	433,939	518,123	617,914	726,707	817,442
N : Administrative and support service activities	1,243,365	1,522,884	1,914,456	2,183,917	2,661,978	3,027,384	3,306,554

O : Public administration and defence	2,882,065	3,615,292	3,973,787	4,548,604	4,846,491	4,986,287	5,124,667
P : Education	1,498,868	1,728,376	2,027,225	2,413,306	2,673,289	2,864,290	3,081,718
Q : Human health and social work activities	1,011,197	1,113,563	1,233,077	1,419,090	1,540,484	1,681,353	1,812,292
R : Arts, entertainment and recreation	174,358	194,938	223,468	248,510	285,626	322,353	374,924
S : Other service activities	474,340	555,957	661,939	717,898	831,216	959,152	1,037,612
T : Activities of households as employers;	138,986	148,022	165,666	177,691	185,501	201,872	215,564
All Economic Activities	**57,683,336**	**67,506,219**	**76,193,180**	**86,484,736**	**99,423,658**	**108,956,774**	**119,194,615**
Taxes on products	4,635,323	5,470,981	6,410,208	7,864,579	8,938,667	9,787,724	10,169,738
GDP at Market prices	**62,318,659**	**72,977,200**	**82,603,388**	**94,349,316**	**108,362,324**	**118,744,498**	**129,364,353**

Source: NBS (2019). National account statistics for Tanzania Mainland
https://www.nbs.go.tz/nbs/takwimu/na/National_Accounts_Statistics_of_Tanzania_Mainland_Tables_2018.xls

Table 3 : **Zanzibar Gross Domestic Product by activities at Current Market Prices (TZS billions)**

Application of data disaggregated at ISIC level 1

Economic Activity	2012	2013	2014	2015	2016	2017
A: Agriculture, Forestry and Fishing	**380**	**432**	**477**	**520**	**605**	**695**
Crops	171	204	213	228	256	313
Livestock	70	80	96	114	167	165
Forestry	33	35	39	41	45	51
Fishing	105	114	128	137	137	165
Industry and Construction	**302**	**349**	**382**	**434**	**529**	**632**
B : Mining and quarrying	16	18	20	23	29	36
C : Manufacturing	132	148	160	180	195	211
D : Electricity supply	6	10	8	12	29	30
E : Water supply; sewerage, waste	7	12	18	20	21	22
F : Construction	141	161	176	199	255	333
Services	**747**	**868**	**1065**	**1173**	**1338**	**1568**
G : Wholesale and retail trade; repairs	133	141	152	162	175	199
H : Transport and storage	76	81	94	102	109	109
I : Accommodation and Food Services	237	267	298	331	388	473
J : Information and communication	21	28	54	53	51	37
K : Financial and insurance activities	37	45	62	79	91	119
L : Real estate	48	71	122	128	181	275
M : Professional, scientific activities	1	2	3	4	4	4
N : Administrative and support service activities	18	21	22	23	25	27
O : Public administration and defense	110	133	159	182	194	199
P : Education	32	44	61	69	75	80
Q : Human health and social work activities		24	27	30	34	36
R : Arts, entertainment and recreation	2	2	2	2	2	3
S : Other service activities	18	22	25	27	33	39
T : Domestic services	3	3	4	5	5	6
Less FISIM	(11)	(16)	(20)	(24)	(31)	(39)
GDP at basic prices	1429	1649	1923	2126	2472	2894
Taxes on products	165	188	225	230	279	332
GDP at Market prices	1594	1836	2148	2356	2750	3226

Source: OCGS (2018). GDP Rebasing Report. 2018 (BASE YEAR 2015).

In order to make the results more accurate, more detailed industry information is required. Data disaggregated to at least ISIC Level 2 is therefore recommended. ISIC Level 2 would distinguish the different economic activities in which businesses are engaged.

ISIC Level 2 would distinguish the different economic activities in which businesses are engaged. For example, at the highest level, ISIC level 1 divides Mainland Tanzania's economy into 24 sectors (see Table 1) and the Zanzibar economy into 23 sectors (see Table 2).

Comparatively, when ISIC Level 2 is observed in the SUTs, Mainland Tanzania's economy is divided into 84 sectors, and the Zanzibar economy is divided into 65 sectors. Section 3.1.2 showcases the difference in results upon the application of ISIC Level 2 data.

3.2.1 Illustration of Supply and Use Table ISIC Level 2 Applied to GDP data analysis of Blue Economy-related sectors

As mentioned afore, in 2015, Mainland Tanzania and Zanzibar developed SUTs to support its national accounting system. These contained level 2 data for most of sectors. Table 3 and 4 below apply the SUTs 2015 data to the example of the tourism and transportation sectors and show how extra detail can help in estimating BE contribution to the economy.

Table 4 : **Value Added by Tourism related industries for Mainland Tanzania at current prices (TZS billions)**

Application of data disaggregated at ISIC Level 2

Industry	2014	2015	2016	2017	2018
G : Wholesale and retail trade; repairs	8,046	8,748	9,862	10,843	11,792
H : Transport and storage	**6,167**	**6,930**	**7,549**	**7,898**	**8,381**
H 49 : Land Transport	4,676	4,561	5,724	5,989	6,355
H 50 : Water Transport	227	255	277	290	308
H 51 : Air Transport	158	177	193	202	214
H 52-53 : Transportation	1,106	1,937	1,354	1,417	1,504
I : Accommodation and Food Services	1,330	1,422	1,523	1,603	1,654
N : Administrative and support service activities	1,914	2,184	2,662	3,027	3,307
R : Arts, entertainment and recreation	223	249	286	322	375
Gross value added - Tourism related activities	17,681	19,532	21,882	23,694	25,509
Tourism related contribution to the GDP at market prices (%)	23.2%	22.6%	22.0%	21.7%	21.4%

Source: Authors estimation based on NBS. (2019). National account statistics for Tanzania Mainland https://www.nbs.go.tz/nbs/takwimu/na/National_Accounts_Statistics_of_Tanzania_Mainland_Tables_2018.xls

Table 5 : **Value Added by Tourism related industries for Zanzibar at current prices (TZS billions)**

Application of data disaggregated at ISIC Level 2

Industry	2014	2015	2016	2017
G : Wholesale and retail trade; repairs	152	162	175	199
H : Transport and storage	94	102	109	109
H 49 : Land Transport	51	55	59	59
H 50 : Water Transport	24	26	28	28
H 51 : Air Transport	8	9	10	10
H 52-53 : Transportation	10	11	12	12
I : Accommodation and Food Services	298	331	388	473
N : Administrative and support service activities	22	23	25	27
R : Arts, entertainment and recreation	2	2	2	2
Gross value added - Tourism related activities	568	620	699	810
Tourism related contribution to the GDP at market prices (%)	26.44%	26.32%	25.60%	25.11%

Source : Authors estimation based on OCGS. (2018). GDP Rebasing Report, 2018 (Base Year 2015). The Office of Chief Government Statistician, Zanzibar, 2018

Tourism has significant backward linkages to sectors that supply tourists' consumption demands such as accommodation, restaurants, beverages and food, retail trade, and transport.[45] Transport and accommodation tourism is indirectly linked to the construction sector, which builds infrastructure for both.[46] In an input-output analysis for Tanzania, Kweka et al. find that tourism can contribute to increasing tax revenue and exchange earnings resulting from the linked sectors.[47]

In addition, linkages to natural resource sectors can be highly relevant to the tourism value chain.[48] In agriculture, the tourism sector has relatively weak backward linkages as agriculture remains a traditional sector which is mainly active in exportation and subsistence production. Thus, tourism expansion does not necessarily result in income generation for rural farming households. Expansion of tourism can even create a contraction in sectors with weak linkages, caused by sectoral competition for production factors or by the Dutch disease effect.[49]

3.3 Economic Data and its Gaps

The BEVT has been designed with reference to the ISIC Revision 4 nomenclature.[50] The fourth revision of ISIC is the outcome of a review process that resulted in an ISIC structure that is more detailed than the previous version. This helped to identify the majority of potential economic activities contributing to the BE.

In Mainland Tanzania and Zanzibar, National Account data are highly aggregated that creates inaccurate estimates of BE figures. Aggregated data allows only for estimations of an industry's contribution to a country's BE, whereas disaggregated data allows for more accurate identification of BE sub-activities. This establishes a lower margin for error when estimates need to be made.

In addition to the above-discussed shortcomings of GDP data, there are various gaps in the current National Account data, particularly in context of the BE. For example, tuna and tuna-like species are important and contribute to the economy of the country through direct employment in artisanal fishing, DWFNs related activities, shipbuilding, and through fish processing. However, there are no current data which indicates the contribution of both tuna and tuna-like species to the GDP or to the marine fisheries sector. Therefore, proper data records regarding both artisanal fishing and DWFNs vessels should be improved in order to establish the contribution of tuna and tuna-like species data for easy understanding of their contribution to the national GDP.

Other challenges faced with regards to accurate economic data collection during the study are:

- 2015 SUTs for Zanzibar do not contain information about employment compensation (wages). The wages in each BE-related industry have been estimated based on 2014 Labour Force Survey for Zanzibar. A lack of socio-economic data made it difficult for a comprehensive assessment under the BEVT.

[45]-Eric T., Semeyutin A., & Hubbard N.(2020). Effects of enhanced air connectivity on the Kenyan tourism industry and their likely welfare implications. Tourism Management, 78, 1-16

[46]-Kweka J. (2004). Tourism and the economy of Tanzania: a CGE analysis. Paper prepared for the CSAE Conference on Growth, Poverty and Human Development in Africa, 21–22 March, Oxford, UK

[47]-Kweka J., Morrisey O., & Blake A. (2003). The economic potential of tourism in Tanzania. Journal of International Development, 15, 335-351

[48]-Damania R, Scandizzo P.L. (2017): The Serengeti ecosystem—Burden or bounty? Journal of Policy Modeling 39 (2017) 185–205

[49]-Kweka J., Morrisey O., & Blake A. (2003). The economic potential of tourism in Tanzania. Journal of International Development, 15, 335-351

[50]-United Nation (2008). International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, ST/ESA/STAT/SER.M/4/Rev.4. Department of Economic and Social Affairs, Statistics Division. New York: United Nations Statistical papers.

- Data from National Accounts are not properly harmonised and leave space for error where some sectors have major contribution through informal sector while others through the more formal sector, creating incongruencies regarding their contribution. Thus, not all sectors that contribute to the BE could be included, due to lack of data about their contribution.

3.4 Ecological Data[51] and its Gaps

The biodiversity supported by URT's marine ecosystems is as impressive and is as important as its terrestrial flora and fauna. Some of the key components of URT's marine ecosystem are:

- **Coral reefs :** A healthy coral reef ecosystem is shown to enhance societal resilience, act as a buffer against pollution, and increase long-term profit when coupled with a diagnostic of the tourism market. Tanzania's coral reefs and diverse intertidal zones extend along the coast of Mainland Tanzania and around its many subsidiary islands. Coral reefs are highly developed and particularly diverse around the islands of Zanzibar, Pemba, Mafia, and the Songo-Songo Archipelago.

- **Mangroves :** Rich in both biodiversity and ecosystem, Tanzania has mangrove forests accounting for about 14% of the carbon sequestered by the ocean, making a net carbon sink. Mainland Tanzania boasts of one of the largest mangrove forests in Africa, estimated at about 108,138 ha. These mangroves contribute to climate change mitigation and reduce greenhouse gas emissions.

- **Valued Species :** In addition, Tanzania has valued species estimated at some 150 species of coral reefs. 8000 species of invertebrates, 1000 species of fish, five species of marine turtles, and many seabirds.

- **Fisheries :** Data used for assessing the overall performance of the fisheries sector in Mainland Tanzania is usually derived from the Fisheries Frame Survey and Catch Assessment Survey conducted by TAFIRI under the Ministry of Livestock and Fisheries. The Fisheries Frame Survey is conducted on a census-based approach every four years in which data and information related to all aspects of a certain fishery activity is collected. The data and information collected in this survey include fishing vessels, fishing gears, fishers and other beach-based fisheries related services and facilities (fish landing sites, fish markets, cold store facilities, etc)[52] both for subsistence and commercial, and it covers all fish of commercial importance. The fishery sector is important in social context for livelihood in coastal regions of Mainland Tanzania and Zanzibar. However, due to financial constraints, these surveys are not conducted as regularly as needed. This hinders the ability of the Ministry of Livestock and Fisheries to have reliable, updated, and accurate fisheries data and information.

[51]-Natural capital is the world's stock of natural resources, which includes geology, soils, air, water and all living organisms

[52]-Kweka J., Morrisey O., & Blake A. (2003). The economic potential of tourism in Tanzania. Journal of International Development, 15, 335-351

- **Wetlands :** It is estimated that wetlands cover over 7% of the country's surface area. The extensive open water areas and fringing swamps of the Great Lakes cover 5.2 million hectares (ha). Tanzania owns 47% of Lake Victoria, 45% of Lake Tanganyika and 20% of Lake Nyasa The remaining permanent freshwater lakes account for 45,000 ha. On the other hand, Tanzania possesses enormous areas of permanent and seasonal freshwater swamps, marshes, and seasonal floodplains, distributed over most of the country's major river systems and covering 2.7 million ha. The largest in this category is the Rufiji- Ruaha River system which has wetlands covering 695,500 ha. Other river systems are: the Malagarasi-Moyowosi system (partly in the Moyowosi Game Reserve), and the Pangani, Wami, Ugalla, Siuwe, Ruvu, Kagera and Mara Rivers. Wetlands provide ecological, social and economic support by acting as special habitat and refuge grounds to many terrestrial animals in drought period. They are used for intensive agriculture schemes. Most of the information captured about the wetlands are through the Water Resource Management of the Ministry of Water. The information captured is about flows and how it will inform social equity, environmental sustainability and economic potential. It moreover focuses only on the main wetlands. It does not inform us of the ecosystem services value of the wetlands.

- **Seagrass :** There are very few information about seagrasses in Tanzania. Distribution maps of seagrasses are only available for some parts in Mainland Tanzania, and for most of the Zanzibar coast. Albeit, efforts are ongoing to map seagrass by a cohort of academic institutions which have come together to identify and evaluate ecosystem services provided by seagrass meadows. They consist of: School of Aquatic Sciences and Fisheries Technology (SOAF) of the University of Dar es Salaam (lead institution); Aquatic Ecology, Department of Biology of Lund University (Sweden); Department of Biological Sciences of Eduardo Mondlane University (Mozambique); Institute of Marine Sciences of the University of Dar es Salaam and World Maritime University of-Malmö (Sweden).

Despite the immense wealth of natural capital available in Mainland Tanzania and Zanzibar, there is a dearth of updated and detailed records of these resources—especially with regards to water bodies other than the sea, and their components.[53]

In order to better know and apply the marine resources, the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) has been encouraging MSP. An MSP would allow maximization of the usage of the ocean resources, as well as a base ground for BE various industries to operate without bringing about potential conflicts. To this end, the National Conservancy (TNC) is currently doing a pre-feasibility study for the same in Mainland Tanzania, and Zanzibar. The outcome of the project will provide baseline information for conducting a full MSP for both Mainland Tanzania and Zanzibar.

[53]-Unlike economic data, ecosystem data are not collected on any specific interval or according to a pre-established set of units. Various scholars, research institutes and NGOs conduct research and inform the cover and the benefits of these resources.

As climate financing and green debt swaps become a common alternative, it is important for countries to capture these data in order to leverage on their lucrativeness. The Wildlife Conservation Society (WCS) is actively assessing the potential contribution that financing and protecting blue carbon ecosystems can make to its conservation initiatives at both small-scale (e.g., Marine Protected Areas) and large-scale (e.g., community) levels.

While it is also fortunate that numerous governmental and NGOs are engaged in monitoring and research projects pertaining to the nation's natural capital, often, this results in organizations carrying out comparable tasks without using a consistent methodology or a centralized repository for data management.

Limited data available along a ten-year frame on the ecosystem services and their valuation in Tanzania is one of the major problems observed. This may be due to inadequate institutional capacities focusing on climate change. This is despite Tanzania's dependence on the climate-sensitive sector such as fisheries, tourism, and agriculture for economic growth. Most of the reliable data present in Tanzania is old and vague thus cannot be used due to changes in the geography of the country over time. Moreover, Tanzania's data collection is not centralized, making it challenging to find and acquire the data.

Most of the BE ecological values used in this assessment are from foreign sources and do not bear a countrywide perspective. Hence, they vary and lack a proper standardized value that could be used in overall estimation.

Although it is difficult to capture data about natural capital and ecosystems in the BEVT, doing so will lead to greater recognition of the significance of ecosystem services. Natural capital assessments demonstrate that by enhancing aquatic resources through sustainable management, the coastal economy could thrive.

3.5 Social data and its Gaps

Since 1950, NBS has been collecting a variety of social statistics for Mainland Tanzania, on areas including on poverty, labour, social security services (health insurance, identification documents); food security, gender - related ownership of assets, and income and expenditure of households.

In Zanzibar, OCGS has been conducting the Household Budget Surveys (HBS) since 1992 to collect data on consumption, expenditure, poverty, and other socio-economic indicators. The first HBS was conducted in 1992. Since, the OCGS has successfully completed four more rounds. The 2019/20 HBS provides updated empirical data for informed policy and decision-making, planning, monitoring, and evaluation at the global, national and district levels of Zanzibar.

In recent years, Tanzania has been, and still is, one of the best performing economies in East Africa. This is reflected in the improvement of its HDI.[54] Between 1990 and 2019, the HDI value for Tanzania increased from 0.368 to 0.529, which is above the average of 0.513 for countries in the low human development group (United Nation Development Programme, 2020[55]; United Republic of Tanzania, 2018[56]). [57] However, the country faces inequalities – including gender inequalities.

[54]-Idris I. (2018) Mapping Women's Economic Exclusion in Tanzania. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies

[55]-See: http://hdr.undp.org/sites/default/files/Country-Profiles/TZA.pdf

[56]-United Republic of Tanzania (URT) (2018). Implementing Partner. Tanzania Human Development Report 2017. Social Policy in the Context of Economic Transformation. Economic and Social Research Foundation

[57]-For example, in Burundi, the average HDI rate in 2020 is 0.431, and in South Sudan, the HDI score in 2020 was at 501.

Based on the official statistical report, [58] there is a gender gap in both economic participation[59] and in income in Tanzania.

Tanzania, like other developing countries, has a large population, and over 65 % of the population depends on agriculture and agriculture-related activities as the primary source of employment and food. Most women work in agriculture, but as unpaid labourers, and earning less than men. Only few of them hold land rights. Women in all areas (rural and urban), and at all education levels, have lower labour participation rates than men.

The social data used in the BEVT were mostly obtained from global databases. It was the weakest element of the project. It was challenging to define which social indicators relevant to the BE that could be applied to the toolkit, and whether these were compiled in the country and where the data resided.

While NBS and OCGS have records on poverty, child labour, income inequality, other statistics such as illegal fishing in the EEZ, drug trafficking, health, for instance, are harder to locate. The illegal, unreported, and unregulated fishing (IUU) and drug trafficking are somewhat implicitly included in the social indicators of the Maritime Security Indexes produced by Stable Seas, but it is not a quantitative assessment.[60]

[58]-Ministry of Finance and Planning - Poverty Eradication Division (MoFP- PED) [Tanzania Mainland] and National Bureau of Statistics (NBS), 2019. Tanzania Mainland Household Budget Survey 2017-18, Key Indicators Report. Dodoma, Tanzania

[59]-United Republic of Tanzania (URT) (2018). Implementing Partner. Tanzania Human Development Report 2017. Social Policy in the Context of Economic Transformation. Economic and Social Research Foundation

[60]-We could have included a quantitative assessment of IUU using SAU data (Sea Around us) but those data are often considered controversial if not inaccurate for some of the countries covered.

4

THE METHODOLOGY FOR MAINLAND TANZANIA AND ZANZIBAR BLUE ECONOMY ANALYSIS UNDER THE TOOLKIT

4 The Methodology for Mainland Tanzania and Zanzibar Blue Economy Analysis under the Toolkit

This section provides an account of stakeholder engagement which vetted the data sources to be applied in this analysis. It furthermore elucidates the data sources applied in this BEVT assessment.

4.1 Stakeholder Engagement

Qualitative information on data sources were obtained through interviews of key informants and stakeholders. There were also additional formal and informal meetings held with other stakeholders whose insights provided additional materials for a detailed assessment of the ecological, social, and economical aspects of the Tanzania's ecosystem. However, stakeholders in Zanzibar have not been consulted. Thus, the estimates for the Zanzibar BE in this exercise are strictly based on SUTs data. The stakeholders consulted for each component of the BEVT are listed below.

4.1.1 Economic

- **Ministry of Livestock and Fisheries** :
  An oral interview was conducted. Questions pertained to the Government's Vision for BE development in Mainland Tanzania and Zanzibar.

- **National Bureau of Statistics :**
  Indicated that the latest version of SUTs for Mainland Tanzania and Zanzibar dates to 2015.

- **International Fund for Agricultural Development :**
  Shared information about its support to URT's Agricultural and Fisheries Development Programme.[61]

- **Deep Sea Fishing Authority :**
  Provided information on the strategy of DSFA and its role in the development of the BE, and about the achievements of the URT in establishing a sound governance regime for deep sea fisheries and related policy actions.

4.1.2 Ecological

- **School of Aquatic Sciences and Fisheries Technology :**
  Provided basic consultation on the general estimated area covered by seagrass on the coast of Tanzania, from Tanga to the south of Dar es Salaam. Provided information on the ongoing seagrass ecosystem valuation.

[61]-To accelerate economic growth in the country by focusing on agricultural and fisheries sectors, the Government of Tanzania has requested the International Fund for Agricultural Development (IFAD) to finance the Agricultural and Fisheries Development Programme (AFDP). This new programme will provide support to two priority areas of the Agricultural Sector Development Programme Phase II (ASDP II). It will address key sector challenges in the seeds, fisheries, and aquaculture value chains, while strengthening institutional capacities of key public institutions and private sector stakeholders. AFDP supports the establishment of the necessary infrastructure, technologies, and systems for sustainable production of marine fisheries and aquaculture (marine and fresh water) towards meeting the country's increasing fish demand. AFDP will invest in at least five fishing vessels (18-25 m long liner with 30-45 MT capacity similar to the one currently operated by ZAFICO) and equipment of appropriate capacity to undertake deep-sea fishing.

- **The Nature Conservancy :**
  Provided information on the ongoing efforts by TNC on MSP.

- **Worldwide Wildlife Fund :**
  Provided information on WWF support to the government in the development of the BE strategy and on the formation of the National Blue Economy Committee

- **Prime Minister's Office :**
  Supported in understanding the challenges of who coordinates the BE in Mainland Tanzania, and current initiatives on BE

- **Ministry of Finance and Planning :**
  Supported understanding of the challenges on who coordinates the BE in Mainland Tanzania, and current BE initiatives

4.1.3 Social

- **National Bureau of Statistics :**
  In order to capture the gender dimension in BE, it was agreed that changes in men's and women's employment and their earnings over time be considered.

4.2 Data Sources Used in the BEVT Analysis

The main data sources that NBS and OCGS use for economic data capture are censuses, surveys, administrative records, and special studies. Regular censuses and surveys are: Annual Agriculture Survey 2014/15; Agricultural and Livestock Sample Census 2007/08; National Panel Survey 2014/15; Census of Industrial Production 2013; Household Budget Survey 2011/12; Integrated Labour Force Survey 2014; Trade and Transport Margin Survey; Import and Export of goods and services; and Government Finance Statistics data.

The credibility of the economic data used in this study is the fact that it is based only upon national databases. To avoid inconsistency between different databases, the latest 2015 version of the SUTs were used as the baseline for Mainland Tanzania's and Zanzibar's BE estimates. Supply and Use Tables include information on Gross Value Added (GVA) data and employment compensation for each BE-related sector. While GVA indicates the overall sector's contribution to the GDP, employment compensation indicates the total wages and benefits paid to employees, for BE related activities.

Supply and Use Tables are an integrated framework which show:

(i) **The sources of supply**: whether the goods and services were produced in the domestic economy or were imported; and,

(ii) **Where and how goods and services are used**: whether the goods and services produced or imported are for intermediate consumption or for final use.

This framework ensures consistency at the detailed product level. It reconciles intermediate consumption, final uses, and also allows a reconciliation of the GDP estimates from the production and expenditure approaches.[62]

[62]-OCGS (2018). GDP Rebasing Report, 2018 (Base year 2015). The Office of Chief Government Statistician, Zanzibar, 2018

The "supply" side consists of entries on domestic production, imports, trade and transport margins, and net taxes. The "use" side consists of entries on intermediate consumption, government and household final consumption, non- profit institutions' consumption, gross fixed capital formation, changes in inventories, changes in valuables, and exports.

The SUT base year 2015 for Mainland Tanzania comprises of 138 products, divided across 84 industries. The SUT base year 2015 for Zanzibar comprises of 147 products, divided across 65 industries.

Supply Use Tables provide benchmark values in the base year 2015, used for compilation of backward and forward gross value added, and components of GDP by production and expenditure. Gross Domestic Product by production approach from the SUTs is calculated as sum of GVA at basic prices and taxes, less subsidies on products. These taxes on products should include all taxes on products that are not deductible, including sales taxes and import taxes (see formula below).

GDP = Gross value added at basic prices + Taxes on products – Subsidies on products

The 2014 Integrated Labour Force Surveys (ILFS) for Mainland Tanzania[63] and Zanzibar[64] have been used to define the numbers of jobs in the BE sector. Employment was divided by gender (male and female) in each sector. 2014's ILFS provide data that identified proportions of male and female in different sectors. This enabled the mapping of both gender groups to value addition.

In terms of discounting[65], the estimates employed were as accurate as possible, and in keeping with constraints present.

4.2.1 Ecological data sources

The ecological data sources used in the BEVT were identified from an extensive literature review and interaction with stakeholders. The consultants read through reliable academic articles, consulted websites, and reviewed papers. Stakeholders which played a vital role in providing the necessary ecological information needed were: WIOMSA, NAIROBI CONVENTION, TNC, MPRU, NEMC, Lake Victoria Fisheries Organization (LVFO), WWF, University of Dar-es-Salaam (UDSM) and TAFIRI. It is to be noted that, nonetheless, there is limited data sources available on most ecosystem services and their estimated value. Additionally, comprehensive data on Tanzania's inland water bodies is lacking.

4.2.2 Social data sources

The social metric estimates used in the social composite indicator of the BEVT are sourced from UNDP and World Bank. This study uses social data from the United Nations Human Development Report 2020 to empirically examine inequality in BE sectors. Other social data metric used are those from the Human Development Index, Education index, Maritime Security Index, Unemployment rate, Gender Inequality Index, amongst others.

[63]-Integrated Labour Force Survey (ILFS) (2015). Integrated labour force survey 2014: provisional tables. National Bureau of Statistics. Ministry of Finance. Dar-es-Salaam https://www.nbs.go.tz/index.php/en/census-surveys/labour-statistics/141-the-2014-integrated-labour-force-survey-ilfs-analytical-report

[64]-OCGS (2015). Integrated Labour Force Survey for Zanzibar http://www.ocgs.go.tz/php/ReportOCGS/LFS%20 2014%20Final.pdf

[65]-Discounting is the process of converting a value received in a future time period to an equivalent value received at the present time.

Table 6 : **Data sources used in the BEVT assessment of Mainland Tanzania**

Data source	Data description	Statistics	Data type
National Bureau of Statistics (Mainland Tanzania)	· 2015 Supply Use Table ; · 2014 Mainland Tanzania Survey of Industrial Production · National Account Statistics for Mainland Tanzania (Year)	Gross Value Added	Economic
National Bureau of Statistics (Mainland Tanzania)	· 2014 Integrated Labour Force Survey	Wages and employment disaggregated by gender	Economic
2015, Vice President's Office, United Republic of Tanzania, Marine Spatial Plan	· National Biodiversity Strategy and Action Plan (NBSAP) 2016-2020	Seagrass cover (km^2)	Ecological
Government of Tanzania	· National Biodiversity Strategy and Action Plan 2015-2020	Mangrove cover (km^2) and coral reef extent (km^2)	Ecological
UNDP	· New Global Multidimensional Poverty Index 2020	MPI	Social
World Bank	· World Development Indicators	Human Development Index, Gini coefficient, Corruption Perception Index	Social
Stable Seas Maritime Security Index	· Maritime security	Coastal Welfare Blue economy components	Social

Source : Compiled by Author

Table 7 : **Data sources used in the BEVT assessment of Zanzibar**

Data source	Data description	Statistics	Data type
The Office of Chief Government Statistician, Zanzibar	· 2015 Supply Use Table ; · GDP Rebasing Report, 2018 (Base year 2015)	Gross Value Added	Economic
The Office of Chief Government Statistician, Zanzibar	· 2014 Integrated Labour Force Survey	Wages and employment disaggregated by gender	Economic
Marine Spatial Plan	· National Biodiversity Strategy and Action Plan (NBSAP) 2016-2020 published by the Vice President's Office, United Republic of Tanzania, 2015	Seagrass cover (km^2)	Ecological
Government of Tanzania	· National Biodiversity Strategy and Action Plan 2015-2020	Mangrove cover (km^2) and coral reef extent (km^2)	Ecological
UNDP	· New Global Multidimensional Poverty Index 2020	MPI	Social
World Bank	· World Development Indicators	Human Development Index, Gini coefficient, Corruption Perception Index	Social
Stable Seas Maritime Security Index	· Maritime security	Coastal Welfare Blue economy components	Social

Source : Compiled by Author

5

ESTIMATION OF TANZANIAN BLUE ECONOMY USING THE BEVT

5 Estimation of Tanzanian Blue Economy using the BEVT

5.1 Overall

The data extracted from the sources listed in Table 5 and Table 6 were used to populate the BEVT for Mainland Tanzania and Zanzibar. In many instances, however, the data required elements of discounting[66] to reflect each activity's relevance to, or reliance upon, the BE.

This section presents how the data was used in the BEVT and discusses the reliability of the data. It also introduces the preliminary simulation results on the economic, social, and ecological modules. The base year is 2015, and the simulated results were compared to the Business- As-Usual[67] path of each module to determine the shock effects.

5.2 Economics

The economic data was extracted from 2015 SUTs of Mainland Tanzania and Zanzibar. These lists all economic activities recognized in both regions, by customized ISIC code, level 1. The 2015 SUTs provide the GVA figures required to measure the contribution of a BE related industry to the country's GDP. It represents the value of an industry's output, less the cost of inputs used up in production, and can be measured as the sum of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus.[68] Additional data regarding the BE contribution to value-added and employment in the manufacturing sectors were obtained from the 2014 Mainland Tanzania Annual Survey of Industrial Production.[69] Wage and employment data was fetched from the 2015 Integrated Labour Force Survey for both Mainland Tanzania and Zanzibar.[70, 71]

Economic data was discounted according to estimates of each industry's reliance on the BE. The calculation of GVA for some industries was relatively straight-forward, but for others it was more difficult. For example, ISIC code I related to "Accommodation and food service activities" comprised primarily of tourism values. The 2015 SUTs for Mainland Tanzania and Zanzibar data included more detailed tourism figures which were used to discount the industries' total GVA value realistically, (i.e., making sure that the value of tourism service in BE was not less than the reported tourism value, and not much higher either).

For other ISIC codes, such as F "Construction sector», estimates were less accurate because these sectors are not directly associated with BE.

Table 7 and Table 8 illustrate the output of an application of the above economic data of Mainland Tanzania and Zanzibar respectively, into the BEVT.

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[66]-Discounting is the process of converting a value received in a future time period to an equivalent value received in the present.

[67]-Baseline scenario that examines the consequences of continuing current trends in BE.

[68]-Colgan, Charles S. 2013. "The Ocean Economy of the United States: Measurement, Distribution, & Trends." Ocean & Coastal Management 71: 334–343

[69]-NBS (2014). Tanzania Mainland Survey of Industrial Production National account statistics for Tanzania Mainland. National Bureau of Statistics. Ministry of Finance. Dar-es-Salaam

[70]-See: https://www.nbs.go.tz/index.php/en/census-surveys/labour-statistics/141-the-2014-integrated-labour-force-survey-ilfs-analytical-report

[71]-See: http://www.ocgs.go.tz/php/ReportOCGS/LFS%202014%20Final.pdf

Table 8 : **GVA of BE-related industry in Mainland Tanzania**

Cumulative Annual Gross Value Added (GVA in USD) generated by the Blue Economy in Mainland Tanzania between 2015 and 2020

Economic Activity by ISIC Section	GVA by sector generated by BE (USD)	As a % of Total GVA generated by BE
G - Wholesale and retail trade ; repair of motor vehicles and motorcycles	3,028,507,893	39.13%
F - Construction	904,169,500	11.68%
C - Manufacturing	656,288,575	8.48%
I - Accomodation and food service activities	615,333,586	7.95%
N - Administrative and supports service activities	604,677,226	7.81%
K - Financial and insurance activities	455,231,526	5.88%
J - Information and communication	319,851,429	4.13%
H - Transportation and storage	274,504,573	3.55%
A - Agriculture, forestry and fishing	263,048,813	3.40%
O - Public administration and defence ; compulsory security	239,376,132	3.09%
S - Other service activities	105,347,715	1.36%
E - Water supply ; sewerage, waste management and remediation activities	92,933,584	1.20%
B - Mining and quarrying	87,753,390	1.13%
D - Electricity, gas, steam and air conditioning supply	69,136,175	0.89%
R - Arts entertainment and recreation	69,641,179	0.31%
P - Education, Human health and Social Services	-	-
Grand Total	**7,739,801,693**	**100.00%**

Source: Model estimation based on data from SUT 2015 of Mainland Tanzania

Table 9 : **GVA of BE-related industry in Zanzibar**

Cumulative Annual Gross Value Added (GVA in USD) generated by the Blue Economy in Zanzibar between 2015 and 2020

Economic Activity by ISIC Section	GVA by sector generated by BE (USD)	As a % of Total GVA generated by BE
R - Arts entertainment and recreation	130,750,235	29.13%
I - Accomodation and food service activities	157,442,967	25.37%
G - Wholesale and retail trade ; repair of motor vehicles and motorcycles	74,916,216	12.07%
A - Agriculture, forestry and fishing	65,165,216	10.50%
C - Manufacturing	57,677,162	9.30%
H - Transportation and storage	48,517,168	7.82%
F - Construction	18,931,209	3.05%
K - Financial and insurance activities	7,515,404	1.21%
N - Administrative and supports service activities	3,829,051	0.62%
P - Education, Human health and Social Services	3,296,313	0.53%
E - Electricity, Water supply ; sewerage, waste management and remediation activities	2,261,756	0.36%
M - Professional, scientific and technical activities	190,263	0.03%
O - Public administration and defence ; compulsory security	21,642	0.00%
Grand Total	**620,514,604**	**100.00%**

Source: Model estimation based on data from SUT 2015 of Zanzibar

5.3 Ecological

Ecological data captured in this evaluation ranged from the ocean, critical marine habitats such as corals, mangroves, seagrasses, and freshwater from the large lakes and rivers. The MSP seagrass data is based upon older (2004) data, and provides a seagrass map for the Tanzanian EEZ, of MPAs only.

Constraints did not allow for an analysis of Geographic Information System (GIS) data which would have allowed us to measure the spatial extent outside of MPAs.

The BEVT does allow for the reporting of the health of ecosystem service or ecological data. This allows for the discounting of the value of services provided due to degraded ecosystems. The relevant output of the BEVT is shown in Table 9.

Table 10 : **Estimated value of the contribution of each ecosystem service to Mainland Tanzania's BE**

Value (USD) of Ecosystem Services Associated with the Blue Economy in Mainland Tanzania between 2011 and 2021

Ecosystem Classification/Service	Estimated Value of Ecosystem Service (USD)	Ecosystem Service Contribution to the overall
F- Freshwater	**83,008,652,142**	**79.64%**
F2 - Lakes	**80,416,988,702**	**77.15%**
F2.1 Large permanent freshwater lakes	78,041,595,450	74.87%
1- Provisioning (Biotic)	**8,041,595,450**	**74.87%**
1.1 - Biomass	78,041,595,450	74.87%
1.1.5 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	**78,041,595,450**	**74.87%**
1.1.5.1 - Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	78,041,595,450	74.87%
F 2.6 Permanent salt and soda lakes	**1,769,273,402**	**1.70%**
1 - Provisioning (Biotic)	**1,769,273,402**	**1.70%**
1.1 - Biomass	1,769,273,402	1.70%
1.1.6 - Wild animal (terrestrial and aquatic) for nutrition, materials or energy	**1,769,273,402**	**1.70%**
1.1.6.1 - Wild animals (terrestrial and aquatic used for nutritional purposes	1,769,273,402	1.70%
F 2.2 Small permanent freshwater lakes	606,119,850	0.58%
1 - Provisioning (Biotic)	606,119,850	0.58%
1.1 - Biomas	606,119,850	0.58%
1.1.6 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	**606,119,850**	**0.58%**
1.1.6.1 - Fibres and other materials from wild plants for direct use processing (excluding genetic material)	606,119,850	0.58%
F3 - Artificial wetlands	**1,594,182,310**	**2.49%**
F3.1 - Large reservoirs	1,594,182,310	1.53%
1 - Provisioning (Biotic)	**1,594,182,310**	**1.53%**
1.1- Biomass	1,594,182,310	1.53%
1.1.6 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	**1,594,182,310**	**1.53%**
1.1.6.1 - Wild animals (terrestrial and aquatic) used for nutritional purposes	1,594,182,310	**1.53%**
F3.3 - Rice paddies	997,481,130	0.96%
1 - Provisioning (Biotic)	997,481,130	0.96%
1.1 - Biomas	**997,481,130**	**0.96%**
1.1.1 - Cultivated terrestrial plants for nutrition, materials or energy	997,481,130	0.96%
1.1.1.2 - Fibres and other materials from cultivated plants, fungi, algae and bacteria for direct use or processing (excluding genetic materials)	**997,481,130**	**0.96%**
M - Marine	13,036,150,400	12.51%
M1 - Marine shelf	13,036,150,400	12.51%
M1.3 - Photic coral reefs	12,046,843,200	11.56%

1 - Provisioning (Biotic)	12,046,843,200	11.56%
1.2 - Genetic material from all biota (including seed, spore or gamete production)	**11,805,014,200**	**11.33%**
1.2.2 - Genetic material from animals	11,805,014,200	11.33%
1.2.2.1 - Animal material collected for the purposes of maintaining or establishing a population	11,805,014,200	11.33%
1.1 - Biomass	241,829,000	0.23%
1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy	241,829,000	0.23%
1.1.6.1 - Wild animals (terrestrial and aquatic) used for nutritional purposes	241,829,000	0.23%
M1.1 - Seagrass meadows	989,307,200	0.95%
1 - Provisioning (Biotic)	989,307,200	0.95%
1.1 - Biomass	989,307,200	0.95%
1.1.5 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	972,720,000	0.93%
1.1.5.2 - Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)	972,720,000	0.93%
1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy	16,587,200	0.02%
1.1.6.1 - Wild animals (terrestrial and aquatic) used for nutritional purposes	16,587,200	0.02%
FM - Transitional Freshwater-Marine	**6,834,595,665**	6.56%
FM1 - Semi-confined transitional waters	6,834,595,665	6.56%
FM1.2 - Permanently open riverine estuaries and bays	6,834,595,665	6.56%
2 - Regulation & Maintenance (Biotic)	6,834,595,665	6.56%
2.2 - Regulation of physical, chemical, biological conditions	6,834,595,665	6.56%
2.2.4 - Regulation of soil quality	6,834,595,665	6.56%
2.2.4.2 - Decomposition and fixing processes and their effect on soil quality	6,834,595,665	6.56%
MFT - Transitional Terrestrial-Freshwater-Marine	**1,345,763,131**	1.29%
MFT1 - Brackish tidal	1,345,763,131	1.29%
MFT1.2 - Intertidal forests and shrublands	1,345,763,131	1.29%
1 - Provisioning (Biotic)	1,106,233,689	1.06%
1.1 - Biomass	846,977,400	0.81%
1.1.5 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	846,977,400	0.81%
1.1.5.1 - Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	846,977,400	0.81%
1.3 - Other types of provisioning service from biotic sources	259,256,289	0.25%
1.3.X - Other	259,256,289	0.25%
1.3.X.X - Other	259,256,289	0.25%
2 - Regulation & Maintenance (Biotic)	239,529,442	0.23%
2.3 - Other types of regulation and maintenance service by living processes	149,848,162	0.14%
2.3.X - Other	149,848,162	0.14%
2.3.X.X - Other	149,848,162	0.14%
2.2 - Regulation of physical, chemical, biological conditions	89,681,280	0.09%

2.2.1 - Regulation of baseline flows and extreme events	89,681,280	0.09%
2.2.1.1 - Control of erosion rates	89,681,280	0.09%
TF - Transitional Freshwater-Terrestrial	**9,848,760**	0.01%
TF1 - Palustrine wetlands	9,848,760	0.01%
TF1.4 - Seasonal floodplain marshes	9,848,760	0.01%
1 - Provisioning (Biotic)	9,848,760	0.01%
1.1 - Biomass	9,848,760	0.01%
1.1.5 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	9,848,760	0.01%
1.1.5.3 - Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy	9,848,760	0.01%
Grand Total	**104,235,010,099**	**100.00%**

Source: Model estimation based on National Biodiversity Strategy and Action Plan 2015-2020

Table 11 : **Estimated value of the contribution of each ecosystem service to Zanzibar's BE**

Value (USD) of Ecosystem Services Associated with the Blue Economy in Zanzibar between 2011 and 2021

Ecosystem Classification/Service	Estimated Value of Ecosystem Service (USD)	Ecosystem Service Contribution to the overall
M - Marine	**75,506,653**	**74.94 %**
M 1 - Maine shelf	**75,506,653**	**74.94 %**
M 1.3 - Photic coral reefs	75,399,703	74.83 %
1 - Provisioning (Biotic)	**75,399,703**	**74.83 %**
1.1 - Biomass	75,399,703	74.83 %
1.1.6 - Wild animal (terrestrial and aquatic) for nutrition, materials or energy	**75,399,703**	**74.83 %**
1.1.6.1 - Wild animals (terrestrial and aquatic used for nutritional purposes	75,399,703	74.83 %
M 1.1 - Seagras meadows	106,950	0.11 %
1 - Provisioning (Biotic)	106,950	0.11 %
1.1 - Biomas	106,950	0.11 %
1.1.6 - Wild animal (terrestrial and aquatic) for nutrition, materials or energy	**106,950**	**0.11 %**
1.1.6.1 - Wild animals (terrestial and aquatic) used for nutritional purposes	106,950	0.11 %
MFT - Transitional Terrestrial-Freshwater-Marine	**15,602,400**	**15.48 %**
MFT-1 - Brackish tidal	**15,602,400**	**15.48 %**
MFT 1.2 - Intertidal forests and shrublands	15,602,400	15.48 %
2 - Regulation & Maintenance (Biotic)	**15,602,400**	**15.48 %**
2.2 - Regulation of physical, chemical, biological conditions	15,602,400	15.48 %
2.2.1- Regulation of baseline flows and extreme events	15,602,400	15.48 %
2.2.1.1- Control of erosion rates	15,602,400	15.48 %
F- Freshwater	9,651,328	9.58 %
F1 - Rivers and streams	9,651,328	9.58 %
F1.5 Seasonal lowland rivers	9,651,328	9.58 %
1- Provisioning (Biotic)	9,651,328	9.58 %
1.1 - Biomass	9,651,328	9.58 %
1.1.6 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy	**9,651,328**	9.58 %
1.1.6.1 - Wild animals (terrestial and aquatic) used for nutritional purposes	9,651,328	9.58 %
Grand Total	**100,760,381**	**100.00%**

Source: Model estimation based on National Biodiversity Strategy and Action Plan 2015-2020

Tables 9 and 10 introduce the estimated value of the contribution of each ecosystem service to Mainland Tanzania's and Zanzibar's BE. The 2004 data was supplemented by per-unit monetary value which was not available under the 2004 data. Therefore, given that the most updated ecological data dates to 2004, the reliability of this output can be assumed to be low. Thus, there is a need to research further on the in-situ estimates of ecosystem service values of URT's BE.

5.4 Social

National sources provide limited social data. National statistics only provide an indication of child labour as part of social statistics (see 2014 Child Labour Survey for Mainland Tanzania).

However, when analysing the situation of child labour, it is important to understand the general demographic breakdown of the population, as this provides the basis for understanding the context in which child labour occurs. According to the 2012 Population and Housing Census (PHC), Tanzania had a population of 44.9 million[72], with a male to female sex ratio of 95.0, and an average population growth rate of 2.7 per cent per annum. At the end of 2020, the total population was estimated at 59.73 million. The 2012 PHC revealed that the Tanzanian population is characterized by a young age structure with 50.1 per cent of the total population below 18 years, reflecting a high fertility rate in the recent past. The Tanzanian population is predominantly rural, with 70 per cent of the population, and about 30 per cent living in urban areas. The "Child labour" (aged 5-14) metric was calculated by estimating the number of working children (aged 5-14) as a proportion of the total number of children in the country. Information for Mainland Tanzania and Zanzibar were complemented by global data mentioned in Table 5. The coastal welfare[73] components were obtained from Stable Seas report.[74] International databases such as that of the UNDP and the World Bank do not distinguish between Mainland Tanzania and Zanzibar when reporting on social metrics. Thus, the social module for Mainland Tanzania and Zanzibar has been estimated by the same data in Table 11 below.

The social module comprises indicators with positive and negative outcomes. Table 11 includes four social categories with carry positive outcomes. The first category is called "Poverty, Nutrition and Education" which is measured by the Education Index. The second category is of "Human Development and Inequality" measured by the HDI. The third category is "Business Environment" which measures the ease of doing business. The last category of social outcomes is of "Maritime Security" which comprises measures of BE infrastructure and coastal welfare.

Social indicators with negative outcomes are divided into two categories. The first being "Poverty, Nutrition, and Education" measured through the Education Index. The second group "Human Development and Inequality" which measures youth and overall unemployment rates, the Gender Inequality Index, and Child Labour Index.

[72]-of which 43.6 million is on Tanzania Mainland and 13 million is in Zanzibar

[73]-Coastal welfare as social welfare is a type of government support intended to ensure that the coastal area population can meet basic human needs such as healthcare, education, infrastructure, housing, and etc.

[74]-Stable Seas Maritime Security Index: Codebook Version 3.0, 2020 Edition

Table 12 : **Relative scores of the preliminary social indicators with a positive outcome for Mainland Tanzania and Zanzibar combined BE**

Social Indicators with a positive outcome by category and dimension for Tanzania between 2014 and 2020

Social category / dimension / indicator	Social Indicator Value	Social Indicator (East Africa average)
P - Poverty, Nutrition, Education	**69.10**	**44.41**
P2 - Education	**69.10**	**44.41**
P24 - Education Index	69.10	44.41
H - Human Development & Inequality	**52.90**	**42.37**
H1 - Human Development	52.90	42.37
H11 - Human Development Index (HDI)	52.90	42.37
B - Business Environment	54.46	49.23
B1 - Access to Business	54.46	49.23
B11 - Ease of doing business (score)	54.46	49.23
M - Maritime Security	45.87	44.27
M1 - Blue Economy	**41.00**	**41.07**
M102 - Adjusted Net Saving Component	62.74	58.08
M101 - Blue Economy Score	38.22	3694
M103 - Climate Vulnerability Component	53.50	55.01
M104 - Fisheries Component	27.74	31.78
M105 - Marine Coastal Tourism Component	27.00	41.43
M106 - Marine Transportation and Shipping Component	53.21	48.73
M107 - Natural Gas Proved Reserves	0.20	0.20
M108 - Port Quantity Indicator	15.99	13.24
M109 - Port Services and Quality Indicator	90.43	84.23
M2 - Coastal Welfare	67.75	58.64
M201 - Coastal Welfare Score	68.51	60.66
M201 - Artisanal Fishing Goal	67.00	56.63
Composite Social Index Value	48.64	44.50

Source: Model estimation based on based on New Global Multidimensional Poverty Index 2020

Table 13 : **Relative scores of the preliminary social indicators with a negative outcome for Mainland Tanzania and Zanzibar combined BE**

Social Indicators with a negative outcome by category and dimension for Tanzania between 2014 and 2020

Social category / dimension / indicator	Social Indicator Value	Social Indicator (East Africa average)
P - Poverty, Nutrition, Education	**31.30**	**29.57**
P2 - Education	**31.30**	**29.57**
P25 -Inequality Adjusted Education Index	31.30	29.57
H - Human Development & Inequality	**27.67**	**28.80**
H1 - Human Development	10.60	7.61
H13 - Youth unemployment rate (% youth pop)	12.20	9.91
H14 - Overall unemployment rate (% pop)	9.00	5.31
B - Human Inequality	**34.50**	**37.28**
H21 - Inequality-adjusted Human Development Index (IHDI)	28.25	38.68
H22 - Gender Inequality Index	56.60	53.00
B24 - Child labour (% ages 5-14)	30.20	28.01
Composite Social Index value	**28.13**	**28.90**

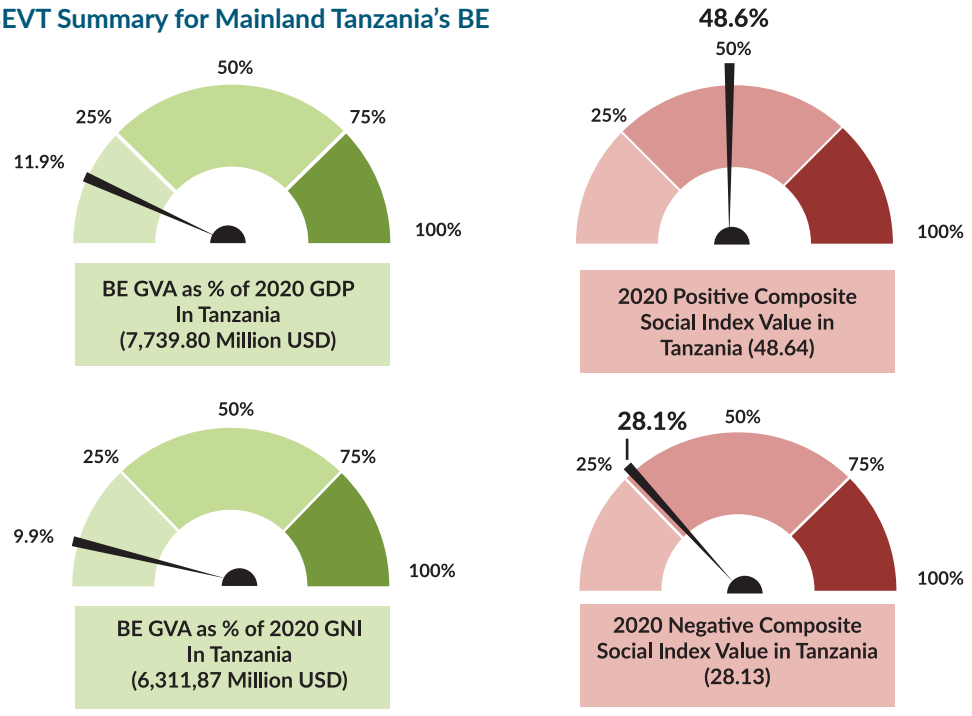
Source: Model estimation based on New Global Multidimensional Poverty Index 2020; 2015 Child Labour survey for Tanzania

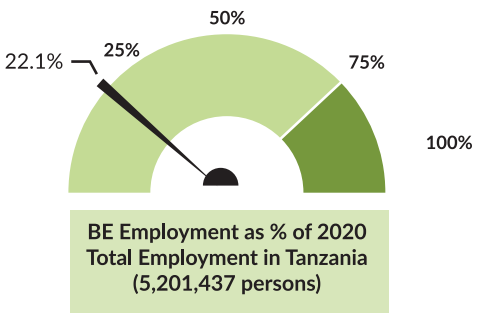
The social data in Table 11 and Table 12 are based upon international databases, giving them an element of credibility.

5.5 Total Blue Economy Value

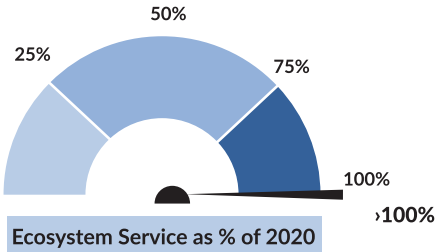
The BEVT consolidates the outputs of the analysis of the three modules : economic, ecological, and social. Figure 2 provides a snapshot summary of the BE's contribution to Mainland Tanzania's economy, based on data from SUT 2015. (see section 2.1.2).

Figure 2 : **BEVT Summary for Mainland Tanzania's BE**

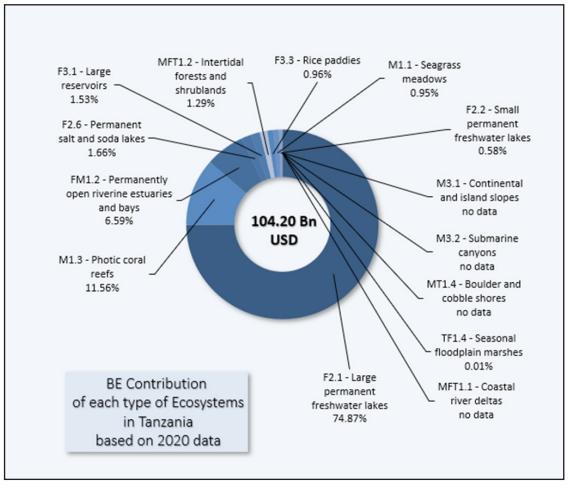


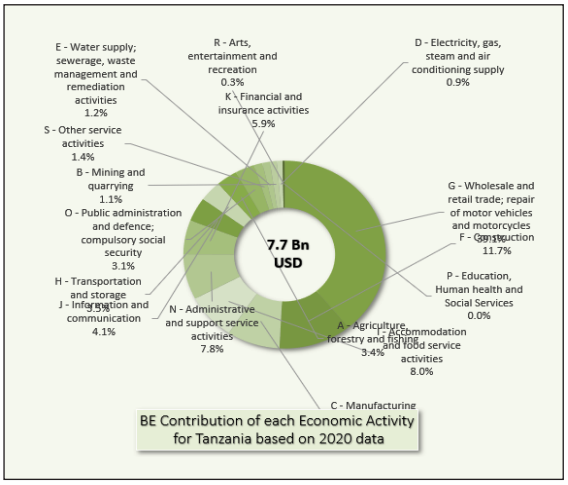


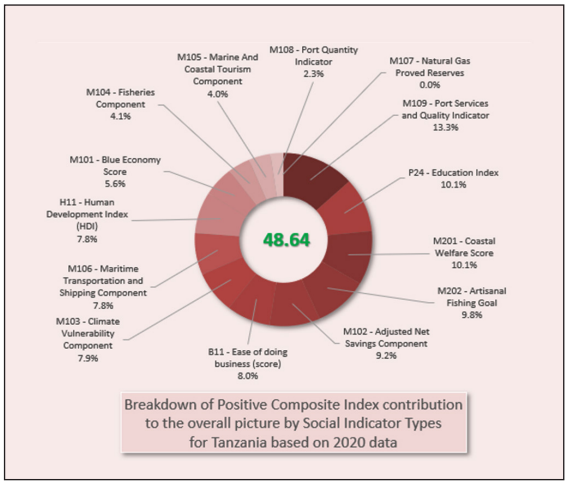
BE Employment as % of 2020 Total Employment in Tanzania (5,201,437 persons)

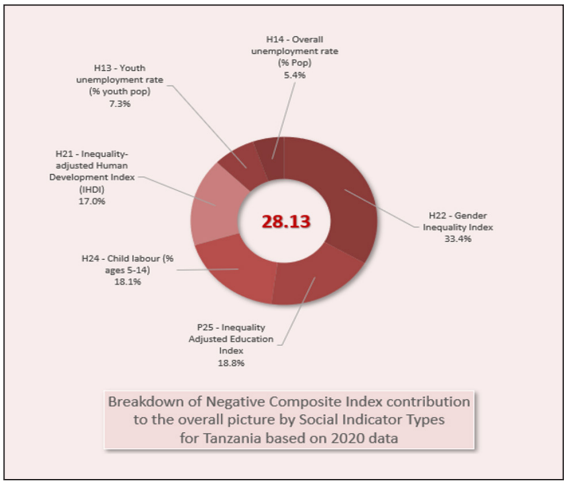


Ecosystem Service as % of 2020 GDP in Tanzania (104.24 Bn USD) (1.6 x GDP)









The analysis therefore indicates BE's contribution to Mainland Tanzania's economy as follows :

Economic :

- BE GVA contributed to 11.9% of GDP, being valued at 7,739.8 million USD in the year 2020.
- The wages that the BE generated in year 2020 were 9.9% of GNI.
- The BE was responsible for approximately 22.1% of all jobs (5,201,437 persons) in year 2020.

Blue Economy contributed USD 7.7 billion to value added (GDP) in 2020.[75] In 2020, the GDP of Tanzania Mainland was estimated at USD 65 billion[76]. Among the BE sectors, those leading the contribution were: retail trade with about 39.13% of BE contribution, followed by coastal tourism with around 7.95% of contribution, transportation with 3.55% and, fisheries and aquaculture with around 3.55%. It should be noted that the contribution of BE-related sectors depends on estimated share of activity's GVA attributable to BE.

While the fisheries sub-sector is the main sector in BE context, according to UNECA, it made a relatively low contribution to the GVA generated by BE. [77] This can be largely explained by several facts such as climate change impacts on water system[78], inadequate infrastructure and high post-harvest fish losses[79], and dominance of small-scale fisheries[80] Fishing activities in Tanzania are gendered, fishermen being the main actors and women are involved only in processing and marketing the fish.

There are about 202,053 people directly involved in fishing activity and more than 4.5 million people are indirectly dependent on fisheries-related activities.[81] The coastal tourism sub-sectors (related to ISIC categories namely accommodation and food services, air, land, and water transport, administrative and support services) are among the significant contributors to the GVA generated by BE. They also contribute to a total employment of about 2 million people related to BE via forward and backward linkages with other sectors of the economy.

Ecological :

- The values of ecosystem services were approximately USD 104.24 billion in the year 2020.

The total value of BE in the ecosystem service is USD 104.24 billion, of which 74.87% is contributed by the existence of large permanent freshwater lakes. The highest value comes from the coral reefs which play a vital role in supporting the existence of huge marine biodiversity as well as act as a nursery for millions of animals. Tanzania, unlike in many other ocean-facing countries, despite having extended coastline and ocean resources, it is freshwater systems that represent a huge part of the ecosystem services contribution in the BE. In 2020, the total contribution of ecosystem services of BE to Tanzania was 1.6 times the country's GDP.

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[75]-BEVT extrapolates 2015 data to 2020 using the GDP deflator. Moreover, the GDP and other macroeconomic variables (GNI, deflators, total employment data) were pre-loaded in the toolkit for each East African country and for a 10 -year period, between 2010 and 2020 so that all the 2020 values are not adjusted, they are the actual data recorded by the UNDP.

[76]-www.imf.org/en/Publications/CR/Issues/2021/12/02/United-Republic-of-Tanzania-Request-for-Disbursement-under-the-Rapid-Credit-FacilityPress-510749 average of GDP data for 2019/2020 and GDP 2020/2021

[77]-United Nations. Economic Commission for Africa (2016-11). The blue economy. Addis Ababa.UNECA. https://hdl.handle.net/10855/23950

[78]-Sekadende B, Scott L, Anderson J, Aswani S, Francis J, Jacobs Z, Jebri F, Jiddawi N, Kamukuru AT, Kelly S and Kizenga H. 2020. The small pelagic fishery of the Pemba Channel, Tanzania: What we know and what we need to know for management under climate change. Ocean & Coastal Management 197:105322.doi: 10.1016/j.ocecoaman.2020.105322

[79]-Mramba R., Mkude K. (2022). Determinants of fish catch and post-harvest fish spoilage in small-scale marine fisheries in the Bagamoyo district, Tanzania, Heliyon, Volume 8, Issue 6, https://doi.org/10.1016/j.heliyon.2022.e09574

[80]-Ministry of Livestock and Fisheries. 2020. The Annual Fisheries Statistics Report (January-December). https://www.mifugouvuvi.go.tz/uploads/publications/sw1632820760 annual%20 fisheries%20statistical%20report%20for%202020.pdf

[81]-https://www.mifugouvuvi.go.tz/uploads/publications/sw1632820760-annual%20fisheries%20statistical%20report%20for%202020.pdf

Social (for both Mainland Tanzania, and Zanzibar) :

- The Composite Social Index Value of BE is at 48.64. This indicates that the BE contributes positively to the social development of URT. The value of this index is higher than the average value for East African countries.
- Social areas which benefit from a positive contribution are: education index, HDI, ease of doing business, coastal welfare, and others.
- Social areas which are afflicted by a negative contribution are: youth and overall unemployment rates, gender inequality index, child labour, and others.

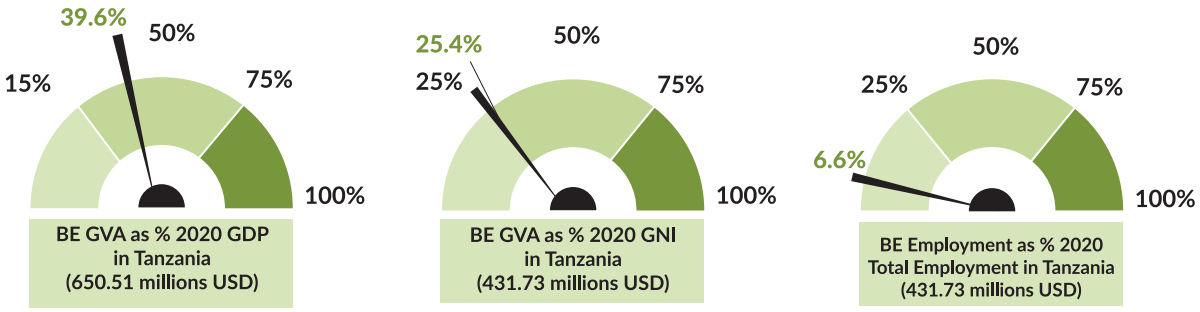
This index combines all social indicators used in the model such as Education index, HDI, Business Environment Index, Maritime Security Index, and Coastal Welfare. An average of the overall score of BE contribution to each social dimension reveals that BE has a positive social impact.

United Republic of Tanzania's HDI score is 52.9 while the East African average same indicator is 42.37. The HDI score for Mainland Tanzania and Zanzibar increased from 44.2 points in 1994 to 52.9 points in 2020. The global average in 2020 based on 185 countries is 72.3 points. Nonetheless, the coastal areas cannot produce enough food to feed its population and must purchase food from outlying areas of the country[82]. As a result, poverty indicators in the coastal regions of Tanzania are way above the national average levels.

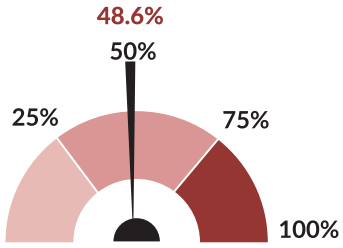
Another estimated social indicator is the coastal welfare. It's score (68.51) is higher than the East African average rate (60.66). Coastal Welfare[83], as measured in the Maritime Security Index[84], includes security at a nationwide level as well as for coastal regions. The indicator accounts for components such as the number of fatal conflict events, homicide rates, HDI scores, infant mortality rates, and measures of artisanal fishing opportunities.

The social module of BEVT has generated a negative outcome for some social indicators. For example, the youth and overall unemployment rates in URT are 12.2% and 9% respectively. In Eastern African countries, these rates are lower at 9.9% for youth and 5.3% for overall unemployment. Tanzania's gender development index (GDI) value is 10.6, while its gender inequality index (GII) value is 55.6, ranking it 129 out of 159 countries. Tanzania's gender inequality index is higher than in Eastern African countries, where it stood at 53.0. This index shows gender disparities in health, empowerment, and employment.

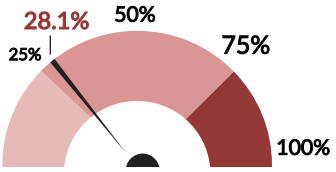
Figure 3 : **BEVT summary statistics for Zanzibar' BE**



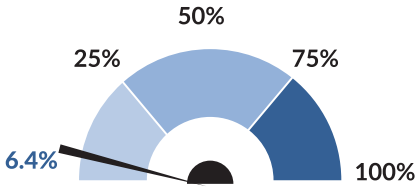
[82]-Huruma 2014. Poverty and livelihood of coastal communities in Tanzania Mainland and Zanzibar. Journal of African studies and development, vol 6(9). https://academicjournals.org/journal/JASD/article-full-text-pdf/E56F67848812
[83]-Stable Seas 2021. Challenges and Solutions for Maritime Security in the Indian Ocean. Policy Brief. https://www.stableseas.org/post/challenges-and-solutions-for-maritime-security-in-the-indian-ocean
[84]-Stable Seas. (2020). Maritime Security Index | Mapping Maritime Security. Retrieved March 2021, from Stable Seas Maritime Security Index: https://www.stableseas.org/issue-areas/overview



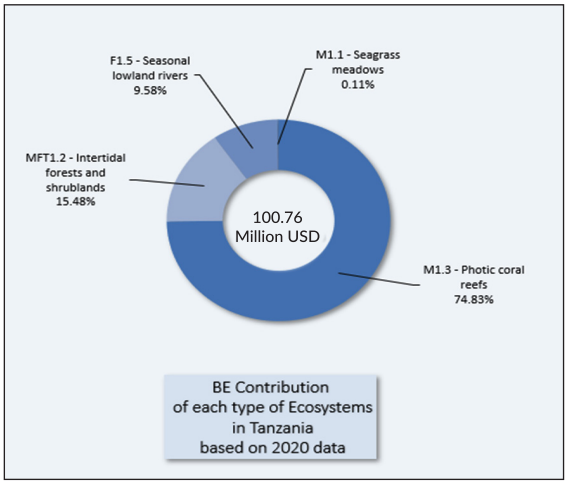
2020 Positive composite Social Index value in Tanzania (48.64 millions USD)



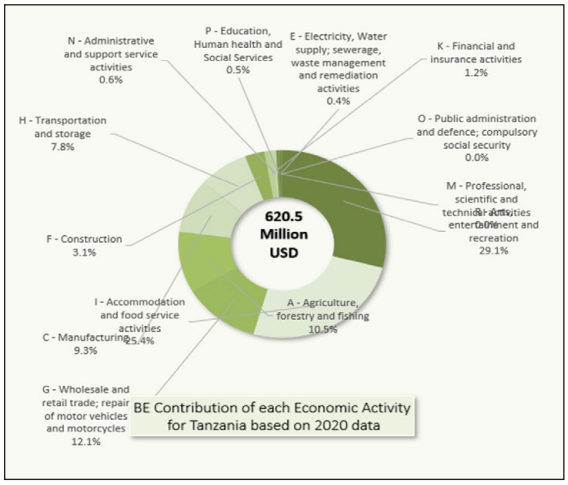
2020 Negative Composite Social Index value in Tanzania (28.13)



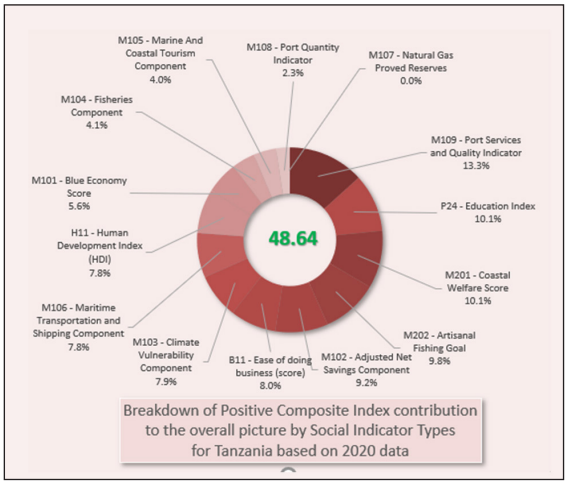
Ecosystem Service as % of 2020 GDP In Tanzania (100.76 Bn USD)



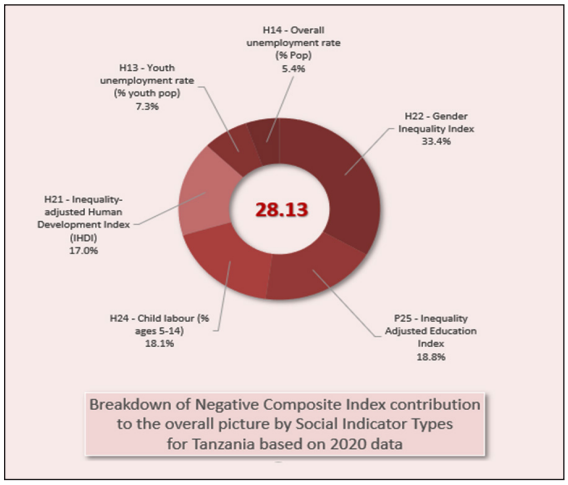
BE Contribution of each type of Ecosystems in Tanzania based on 2020 data



BE Contribution of each Economic Activity for Tanzania based on 2020 data



Breakdown of Positive Composite Index contribution to the overall picture by Social Indicator Types for Tanzania based on 2020 data



Breakdown of Negative Composite Index contribution to the overall picture by Social Indicator Types for Tanzania based on 2020 data

Economic :

- BE contributed 39.6% to the GDP of Zanzibar in year 2020.

In year 2020, Zanzibar's BE sub-sectors and components generated a USD 1,119.9 billion. According to BEVT simulation results (see Table 8 and Figure 3), tourism continues to lead with 25.3% contribution to GVA, supported by other activities such as transportation (7.8%), retail trade (12.07%), fishing (10.5%), and manufacturing - food processing industries (9.3%).

- The employment compensation (wages) that the BE generates amount to 25.4% of GNI in year 2020.

There are about 315,763 people engaged in sectors related to BE, which is about 72% of the total number of people employed in the Zanzibar economy. Most of the BE-related sectors employ men rather than women. Therefore, BE-related sectors do not contribute to empowering women as owners of farms or as important actors in fisheries and tourism value chain and marketing.

Ecological :

- The ecological summary shows that the value of ecosystem services in Zanzibar is approximately USD 100.76 billion according to data from 2020.

Zanzibar's BE ecosystem service is linked to the ocean since it is an island. The contribution from the ecosystem services is USD 100.76 billion. The highest value is being contributed by coral reefs constituting 74.83% of total contribution. Zanzibar's typology has created a vast space for corals expansion that has been attributed to the good environment that prevails in Zanzibar, compared to the Mainland. The corals are crucial in hosting biodiversity as well as help decrease wave of motion which eventually reduces the rate of coastal erosion for small island states.

Social :

Within the BE in Zanzibar, the top contributing sub-sectors are: tourism and recreation (25.4%), trade (12.1%), transport (7.8%), and agricultural and fishing (10.5%). Together, they account for more than 50 percent of all value added in Zanzibar's BE.

6

RECOMMENDATIONS

6 Recommendations

This section presents strategic recommendations and policy implications for BE development in Mainland Tanzania and Zanzibar, following from the observations resulting from an application of the BEVT :

1 **Zanzibar :** A separate BEVT domestication should be conducted for Zanzibar.

2 **Coordination of BE work :** It is critical to identify the institution coordinating the BE work at the helm of the Government.

3 **Official Adoption of the BEVT** : The BEVT is a tool which encourages evidence-based policymaking and planning in the BE domain. It enhances the value of government plans and programmes, and also supports countries in reporting on relevant SDGs and developments when seeking to raise funds in the international community. To this end, it is recommended that the Government of Tanzania officially recognises and adopts the BEVT as a policy-planning tool for BE.

4 **Custodian of BEVT :** It is critical that a custodian of the BEVT is identified and trained. The role of the custodian is (i) to coordinate and collect data from all relevant stakeholders, (ii) to conduct data entries in the BEVT in order to produce regular valuations in order to inform BE policymaking. The custodian should be confident in dealing with at least one of the primary data types (i.e., economic, ecological, and social), and understand where all the data sources are, and how to collect it. The custodian should either house the data, or have sound inter-sectoral communication and data access, as the data collection will require assistance from other sectors. Suggested custodians include TAFIRI or NBS in Mainland Tanzania, and OCGS or Ministry of Blue Economy and Fisheries in Zanzibar. From a practical perspective, the development of all BE accounting should be done in a unified way and coordinated by the same institution. In that way, it will ensure that all situations are taken into consideration within a modulable framework.

5 **Stakeholder participation** : Stakeholder participation and strategic interventions should be ensured when using and updating the BEVT.

6 **Data sources :** Ease of access to data is critical for the long-term success of the BEVT. Reliability of the present data sources and future data should be carefully confirmed and heavily discussed to avoid any misinformation and miscalculation of the value of the BE in Tanzania. Data on global trends and changes that could affect ecosystem behaviour (i.e., climate change) should be collected for comparison. From discussions with representatives of NBS, it became clear that the ISIC nomenclature from which Tanzania System of National Accounting is based could be expanded at ISIC level 4 equivalent to show more precise contribution of the BE.

7 **Ease of entry and replicability :** Data access and data entry need to be easily available and replicable to ensure the continuity of the BEVT. Officials should be trained to be able to alter the functions, machinery and data input of the BEVT as, over time, data would fluctuate and may also warrant a more multi–disciplinary approach.

8 **Ease of use :** Ensuring that the BEVT is easy to use is critical to its success. Therefore, it is recommended that at each stakeholder reporting to the BEVT custodian should train at least two officials on how to use the BEVT.

9 **Research agenda and data collection with a purpose :** Under the custodian's leadership, Government should establish a research agenda that fills the gaps in the data required to complete the BEVT. Such an agenda should prioritise projects delivering more critical or important data. This research agenda should be linked to the BE grant themes and other

research priority documents and must be coordinated by a single body to ensure that the agenda is being driven. Collecting data with a purpose enables agencies to be more focused in their data collection and project creation.

10 **Accurate discounting methodology :** Discounting of data for the BE was the trickiest part of this study. Establishing a methodology for conducting such discounting would be beneficial. However, it should be noted that the methodology should be adaptable, as the discounting is likely to change depending on each simulation scenarios used in this study.

11 **Comprehensiveness of the Assessment:** The comprehensiveness of the BEVT assessment can be enhanced through the capture of data on other unaccounted BE resources existing in Tanzania. These include rivers, lakes as well as wetlands. To this end, it is encouraged to pursue an accounting exercise of its various BE resources.

12 **Awareness:** To ensure the success of the BEVT, all stakeholders need to be made aware of it. This should be done once the BEVT is at an advanced stage (i.e., now). If adopted, or supported by critical stakeholders, there is vastly increased likelihood of its success. Mass awareness about BEVT and its availability under organizational and institutional programs for remote areas of Tanzania where technology can be limited but rich in biodiversity should be taken into consideration during policy formulation and implementation.

13 I**nclusion of all BE resources in the policy documents relevant to the BE**: Any BE strategy document or policy should consider all the BE resources, inclusive of lakes, rivers and wetlands. Data about the economic, social and ecological value generated should be captured by establishing a systematic methodology.

14 **Valuation of Ecosystem Services:** There is a lack of consistent and updated data on the value of ecosystem services of URT's BE resources. Such an effort is required.

7

POLICY IMPLICATIONS

7 Policy implications

Through this study, it is possible to quantify the contribution of industries associated to the BE to total domestic output, and the supply of BE into other industries' activities. Therefore, it is important to increase the exploitation of marine resources to generate economic as well as social and ecological benefits, while improving statistical systems to monitor and evaluate the resulting impact on national output and supply of other productive sectors.

The evidence-based analysis of the BEVT can be helpful to the Government in order to develop activities in the BE and open up the sector for investment.

Based on research results from economic, social, and environment modules of BEVT, the Government of URT could consider the following options and approaches for action to build effective and sustained partnerships for a BE-centric development :

- Map and engage with relevant regional and international BE initiatives, (for instance, through participation in workshops, webinars, and conferences).
- Explore how higher education and skills development strategies can ensure a sustainable BE for new generations. This could include the development of a Master's programs to attract students from diverse academic backgrounds (such as economics, biology, environmental technology, and etc.); skills development programmes in areas of aquaculture, ship-building, cruise-related jobs, and support BE leaders.
- Strengthen the involvement of the local coastal community in touristic operations so as to improve environmental, social, and economic benefits from the BE-related sectors to the coastal communities.
- Review and assess the success and gaps of the National Environmental Research Agenda, 2017-2022, taking into account mapping of the marine and freshwater ecological resources.
- Create interoperable data from across institutions to incorporate effective conservation and management of ecosystems and biodiversity in development plans of the Tanzanian BE.
- Achieve greater coordination with the agencies mandated with BE environmental conservation and with regional partners in setting national standards for an ecosystem approach for governance of migratory species. This approach will include measures for pollution abatement, management of invasive species, and by-catch reduction.
- Estimate the values that the Tanzania coral reefs, coastal forests, historical sites, and other tourist attractions provide to Tanzania society so as to best manage the ecosystem services and economic opportunities that rely on these systems over time.
- Undertake a comprehensive assessment of the diverse BE schemes in order to address existing deficiencies and develop a sustainable and coordinated BE framework. Currently, there are over 105 laws dealing with various aspects of the management of the BE in the URT. These laws predate any consideration of the BE, and in most cases, the existing legal and institutional structures do not provide for the close inter-agency coordination that is necessary for the effective implementation of a Tanzanian BE strategy. Only the Government of Zanzibar established the Ministry of Blue Economy and Fisheries that combines key departments into an effective coordination structure.
- The Ministry of Finance and Planning should take the lead in developing a BE financing strategy and action plan to identify BE financing needs, sources of revenue, and expenditures over a five-year period.

- Although Tanzania has made substantive progress in BE-related sectors, an inclusive and comprehensive National Blue Economy Strategy would still require further engagement with national and sub-national public and private stakeholders. The proposed actions will support the country in finalizing this important endeavour and increase synergies regarding BE and actions.

Annex 1

Table 14 : **Stakeholder engagement list**

Organisation	Role	Primary Interaction (Phone/Physical)
SoAF	Project officer	Meeting
The Nature Conservancy	Marine spatial planning coordinator	Meeting
World Wildlife Fund - Tanzania Office	Marine Programme coordinator	Meeting
School of Aquatic Sciences and Fisheries Technology	Dean	Meeting
Prime Minister's Office	Officer	Meeting
Ministry of Finance	Officer	Meeting
Deep Sea Fishing Authority	Officer	Meeting
National Bureau of Statistics	Director of Economics Statistics Directorate	Meeting
Natural Resource Management	Sector coordinator	Meeting
MNRT - Tanzania Forest Services Agency	Conservation Commissioner	Meeting
Ministry of Livestock and Fisheries	Director of fisheries	Meeting
Tanzania Fisheries Research Institute	Director General	Meeting
Sokoine University of Agriculture	Professor	Meeting
UNDP-Tanzania	Environment Leader	Meeting
WWF-Tanzania country office	Country Director	Meeting
Wetland International Tanzania	Country Program Coordinator	Meeting
The Nature Conservancy	Country Director	Meeting
Aqua-Farms Organization	Chairperson	Meeting
Environmental Management and Economic Development Organization	Director	Meeting
World Wildlife Fund	Fisheries Officer	Meeting

United Nations
Economic Commission for Africa