Regional Integration and Blue Economy: The Case Study of Seychelles

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Abstract: Using data between 2005 and 2022 on essential variables such as fish production, export of goods and employment, completed with qualitative data, this study teases out the impact of the blue economy on economic growth, expressed as gross domestic product with Seychelles as a case study. The multiple regression model was used to analyze the quantitative data in SPSS Version 20 and Wordstat 7 software for the qualitative data. Results showed that employment of foreign workers in the blue economy and exporting goods via Port Victoria were significant at the 5% level. Employment in the fishery sector for foreign workers increased steadily from 2009 to 2022. Moreover, tourism and fisheries are the primary sources of employment in Seychelles, providing employment directly and indirectly to about 75% of the Seychellois population. Fish production was the only variable that wasn't significant. While the annual fish production in Seychelles is 326,806 MT, a steady increase has occurred between 2005 and 2022. Information gathered from the key informants indicated an increase in the partnership Seychelles has signed with the European Union, Mayotte, Taiwan, Mauritius, China and Korea. The export of goods averaged 40.88 million USD from 2005 until 2023, reaching an all-time high of 82.51 million USD in March 2019 and a record low of 7.83 million USD in January 2021. Seychelles is still largely a mono-economy and highly dependent on tourism. Therefore, the blue economy offers enormous potential for diversification and the Blue Economy Roadmap of Seychelles should be revised to achieve this objection.

Keywords: Gross Domestic product; Seychelles; regional integration; Blue economy; Sustainable development

1. Introduction

The Blue Economy (BE) emerged as an influential concept at the 2012 Rio+20 United Conference on Sustainable Development, redefining the role of coastal and marine space in sustainable development. A more comprehensive definition is provided by the Complexity in Small Island Developing States (SIDS) concept paper of the World Bank (Everest-Phillips, 2023) that the "Blue Economy is a marine-based economic development that leads to improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities". Globally, the ocean and its resources are increasingly being advocated as a development space, particularly in Small Islands Developing States (SIDS), with an increasing number of BE initiatives and activities promoted nationally and by international development partners (World Bank, 2017; Stuchtey et al., 2020). According to the United Nations Economic Commission for Africa (UNECA), the BE is a new frontier

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for African development (UNECA, 2019). In general, the Blue Economy spans several of the Sustainable Development Goals (SDGs), and SDG14-Life Below Water (Keen et al., 2018), encompasses a broad range of sectors, industries and stakeholders across the public and private sectors, all competing for the use of the same ecosystem (Keen et al., 2018).

To achieve sustainable and equitable benefits, ocean management, protection and conservation often require cooperation and collaboration across national and regional economic communities (Fulanda & Seisay, 2020). The engagement of multiple stakeholders and different sectors reaffirms the cross-cutting nature of BE development, which cannot be achieved in isolation, especially when attempting to understand the extent of its socio-economic context in the aspiration of development achievement. Many developed and developing countries globally recognize the ocean as a space for economic growth, especially for SIDS (Robert & Ali, 2016). In their paper, Nuta and Nuta (2020) highlighted that integrating demographic and institutional factors into existing models reveals that fiscal pressure isn't solely attributed to economic factors but also to demographic and institutional components. The study's primary contribution lies in emphasizing that not only economic aspects but also social, demographic, and institutional factors significantly impact fiscal pressure. These factors can alter taxpayer behavior, potentially resulting in adverse effects.

In September 2014, the SIDS (Small et al., 2014) met in Apia, Samoa, to develop a plan considering the unique characteristics and vulnerabilities of SIDS, which highlighted challenges faced towards BE development, such as climate change, limited land, lack of sufficient human resources capacity and capital (World Bank, 2017).

The African continent offers enormous potential for economic development, especially within the framework of the Blue Economy (Karani et al., 2022). This potential is reflected in the extensive coastline across the 55 African Union (AU) Member Countries, estimated to be 30,000 kilometers long. Aside from the vast coast, the maritime zones under Africa's jurisdiction total up to 13 million km^2, including territorial seas and approximately 6.5 million km^2 of the continental shelf. The potential for Africa's blue economy is enormous, with over 90% of imports and exports transported by water, highlighting the continent's strategic geographical position for advancing regional and international trade (UNESCO, 2016). The vast ocean and lake resources allow African countries to diversify their economies (AUDA-NEPAD, 2021).

Numerous studies, such as those by Fischer & Heutel (Citation2013) and Fischer & Springborn (Citation2011), affirm a clear link between environmental policy and economic advancement. Public attitudes towards environmental issues significantly impact changes in broader economic indicators and fluctuations in economic growth. Authors like Angelopoulos, Economides and Philippopoulos (Citation2010) compare different environmental policy approaches, for instance they analyze decision-makers' engagement in pollution control and strive to determine optimal taxation methods (Angelopoulos, Economides & Philippopoulos, Citation2013). In conditions compounded by an economic crisis, it becomes imperative for an emerging economy to thoroughly comprehend and effectively model available environmental policy options.

Seychelles as a Small Island developing state has strongly advocated the blue economy concept in international fora since 2010 and is one of the few countries implementing a blue economy agenda (Voyer et al., 2022). Seychelles initiated a national blue economy strategy in 2012, establishing a Blue

Economy Department and a Blue Economy Research Institute as early as 2015 (Benzaken et al., 2022), which led to the adoption of a Blue Economy Strategic Policy Framework and Roadmap (2018–2030) in 2018 (Republic of Seychelles, 2018). Seychelles has achieved international visibility thanks to a successful debt swap for conservation and climate change adaptation in 2015 and the issuing of the first blue bond for transitioning to sustainable fisheries in 2018, both of which contributed to the implementation of Seychelles blue economy roadmap (Republic of Seychelles, 2018; World Bank, 2018). However, Seychelles needs a national strategy for regional integration to enhance its Blue Economy's sustainable development. Blue Economy variables, such as total fish production, total goods exported, and the Liner Shipping Connectivity Index (LSCI), can be expressed as a function of gross domestic product (GDP) from which economic growth can be measured.

This study focuses on the role of Regional Integration (RI) towards Blue Economy development within the context of Seychelles as the case study. Given the wide range of activities within the BE, this study will focus on essential variables that affect Seychelles' economic growth. These variables will include annual fish production, export of goods via the Port of Victoria, the Liner Shipping Connectivity Index (LSCI), employment of foreign workers in the Seychelles BE, and tourist arrivals between 2005 and 2022. These variables are essential in measuring the impact of the BE on economic growth, and they all align with the strategic pillars of the Seychelles Blue Economy Roadmap 2018 -2030 (Republic of Seychelles, 2018).

2. Literature Review

Regional integration (RI) is a multifaceted process whereby sovereign nation-states establish common political, legal, economic, and social institutions for collective governance (Hix, 2001). In other words, RI is the process by which two or more nation-states agree to cooperate and work closely to achieve peace, stability, and wealth. In this modern day, regional integration is seen as a means of gaining leverage through regional blocs rather than a fragmented, individualistic approach or a minimal level of cooperation that is even more globalized. It involves considering countries' similarities, proximity, and structures to enable a more tailored approach to the integration process. This approach allows for a more effective regional integration process (IDRC, 1997). Literature defines integration concepts and explores the various scopes and dimensions countries have engaged in for integration. It demonstrates the benefits and advantages of integrated countries, as well as the downside of such integration that has led to disintegration, like the recent BREXIT from the European Union (Wallenfeldt, 2022).

One of the biggest obstacles to economic progress for many Small Islands Developing States (SIDS) worldwide is their vulnerability to market shocks, insularity, remoteness, and proneness to natural disasters, which increasingly jeopardizes their ability to achieve economic development (Sjöstedt and Povitkina, 2017). This issue led numerous nations to seek solutions combining resource exploitation and economic growth. The exploitation of the seas and oceans, among the most prolific and diversified systems, has recently increased to boost productivity and economic development. Since the ocean globally is thought to be worth roughly 6.5 trillion dollars, the blue economy has developed as one of the main drivers of economic growth for nations through the prudent and sensible exploitation of marine resources (Muhaimid et al., 2022), and Seychelles is not an exception. With emphasis on responsible and equitable management of marine resources, the blue economy can contribute to reducing poverty

and inequality in coastal and island communities. It also supports economic growth while addressing environmental issues such as overfishing and marine pollution (Purvis, 2022).

Like the current subject, Nuta & Nuta (2020) highlighted the concern that addressing environmental issues, particularly global greenhouse emissions, places significant pressure on decision-makers to prioritize environmental concerns. This pressure prompts decision-makers worldwide to evaluate their country's ecological impact and seek strategies for enhancement. Governments are thus compelled to devise approaches to meet national targets and enhance environmental quality.

2.1. Theoretical Review

Regional integration often sparks discussions about whether states are inevitably being absorbed into regional federal unions or can choose to integrate, as per the Kanhutu Principle (Kanhutu, 2013). Although there is no one-size-fits-all theory on regional integration, different theories have effectively addressed specific aspects of the topic. Concerning the Blue economy and regional integration, which involves wise and sustainable uses of oceanic resources such as fisheries, aquaculture, tourism, and renewable energy, the research has identified two suitable theories: regionalism and systems theory. Both of these theories are relevant to the case study of Seychelles (Voyer et al., 2018). Recently, regional integration has emerged as a crucial strategy to promote collaboration and unity among neighbouring countries. The objective is to attain mutual progress and advancement in the economic sphere (Kaswan, 2017). Furthermore, as per the research conducted by Ayab et al. (2023), the discussion surrounding environmental quality and climate change has gained significant traction among scholars across various scientific disciplines in recent decades, primarily due to their profound influence on both human health and economic advancement.By conducting an in-depth examination of pertinent literature, this review endeavours to offer valuable perspectives on the potential advantages, obstacles, and possibilities associated with incorporating the blue economy into regional frameworks, with a particular emphasis on Seychelles as an intriguing example.

2.1.1. Theoretical Review of the Regional Integration

To understand the complex dynamics of regional integration and its impact on the Blue Economy in Seychelles, it is essential to delve into the foundational integration theories. Bela Balassa's book, "The Theory of Economic Integration," provides a comprehensive framework for analyzing these theories.

Firstly, the customs Union Theory (1950) advocated by Jacob Viner, who was the first to use trade creation and trade diversion terminology to describe the effects of economic integration, is the leading Theory on which Balessa's Theory of Regional Economic Integration (1961) was built on (Bonilla Bolaao, 2016). Some rehabilitation of Viner's Theory, such as the one by Kemp and Wan, advocate that trade diversion effects of a customs union could be offset by setting an appropriate standard external tariff and implementing a redistribution inside the customs union, thus resulting in unchanged trade flows between the customs union and non-partner countries. This could, therefore, make the customs union Pareto-improving, refuting the notion that a Customs Union only leads to a potential Pareto-improvement of the union partners, leaving the non-trading partners unaffected (Granger, 2001). Viner's

Theory has, however, been criticized for its lack of precise specification for its inherent assumptions (Granger, 2001) and limited relevance (Hosny, 2013).

The Customs Union Theory represents one of the foundational approaches to regional integration. It centers on creating customs unions, where member countries eliminate or significantly reduce trade barriers among themselves while imposing a standard external tariff against non-member countries. The primary objective is to create a larger integrated market for member countries, thereby enhancing economic efficiency (Balassa, 1961). Customs unions focus on the harmonization of trade policies, the removal of internal tariffs, and the establishment of a unified external trade policy. An example of this theory can be observed in the European Union's customs union, which promotes the free movement of goods and services within its member states while maintaining a unified trade policy towards non-EU countries.

Secondly, the Economic Union Theory extends the concept of customs unions by encompassing a broader range of economic policies and institutions. In addition to reducing trade barriers, economic unions aim to align fiscal and monetary policies, often including adopting a common currency and establishing a central bank. The European Monetary Union (EMU), marked by the adoption of the Euro and the creation of the European Central Bank, exemplifies this approach (Balassa, 1961). Economic unions seek to create a more seamless economic environment by harmonizing economic policies and institutions. This includes coordination of fiscal policies, regulatory frameworks, and monetary policies, contributing to the further integration of member countries.

Bela Belassa (1961), in his illustration of the Economic Integration Theory, defines economic integration, identifies its stages, highlights the political and ideological aspects of the integration process, and specifies what he means by economic welfare. Balassa's theoretical embodiment embraces measures intended to abolish discrimination among economic units and a state of affairs denoted by the absence of several forms of discrimination between national economies (Balassa, 1994). To eliminate discrimination, the Optimum Currency Area (OCA) Theory is often advocated as part of the solution. This theory examines the conditions under which countries should adopt a common currency, such as the Euro, in the case of the EMU. The theory emphasizes that countries should only adopt a common currency if their economic structures and responses to economic shocks are sufficiently similar (Balassa, 1961). OCA theory underscores the importance of labor mobility, the ability to coordinate fiscal policy, and the synchronization of business cycles.

According to Balassa, in 1961, the New Trade Theory focused on the positive impact of regional integration on trade and economic growth. It suggests that integration enhances competitiveness by increasing economies of scale and reducing trade costs. As countries integrate, they experience specialization of industries, leading to increased trade and economic benefits (Balassa, 1961). This theory highlights the importance of integration in promoting efficiency, particularly by encouraging specialization, increasing economies of scale, and reducing production costs. It underscores that the integration process can lead to increased trade and economic growth, which can benefit member countries. Balassa's work contributes further to our understanding of the effects of integration on Trade, welfare, and other economic and political segments (Bonilla Bolaao, 2016). Its relevance is also essential in developing countries that are less industrialized, where the countries need help with relative marginal adjustments in production and consumption patterns.

In summary, these four theories of regional integration offer a comprehensive understanding of the motivations, mechanisms, and outcomes of regional integration processes. While Customs Union Theory focuses on trade barriers and external tariffs, Economic Union Theory encompasses fiscal and monetary policies. Optimum Currency Area Theory examines the conditions for adopting a common currency, and New Trade Theory emphasizes the economic benefits of integration. Understanding these theories is critical for analyzing the impact of regional integration on the Blue Economy in Seychelles.

2.1.2. Theoretical Review of the Blue Economy Concept

The Blue Economy concept has gained significant attention in recent years as nations seek sustainable approaches to harness the potential of their marine and aquatic resources. This theory revolves around the environmentally responsible and economically viable use of oceanic assets. Within the Blue Economy framework, two vital theoretical approaches stand out: environmental and marine sustainability theories and the efficient management of environmental externalities associated with the ocean.

The first pillar of the Blue Economy is the promotion of environmental and marine sustainability. This theory underscores the critical importance of managing marine resources in a way that ensures their long-term viability. Several vital aspects define this theory. Firstly, Conservation and Biodiversity. At the core of environmental and marine sustainability theories is the need to preserve and protect marine ecosystems and biodiversity. It emphasizes the importance of safeguarding critical habitats and species to maintain the ecological balance in oceans and coastal areas (United Nations, 2019).

On the other hand, Sustainable utilization of aquatic resources is a central tenet of environmental and marine sustainability theories. This includes adequate and adaptive management practices to prevent overfishing, habitat destruction, and pollution (World Bank, 2020), resulting in responsible resource management. At the same time, Economic Diversification theories argue that the Blue Economy can promote economic diversification by encouraging the development of new industries and job creation related to the marine environment. It emphasizes that sectors such as marine renewable energy, biotechnology, and aquaculture can contribute to economic growth while maintaining ecological integrity (UNEP, 2014). While Marine protected areas (MPAs) play a pivotal role in environmental and marine sustainability theories. Establishing MPAs contributes to biodiversity preservation and the restoration of depleted marine resources. Such areas serve as laboratories for studying marine ecosystems and can inform sustainable management practices (Halpern et al., 2015).

Integrating sustainable tourism practices is crucial to environmental and marine sustainability theories. It promotes the development of eco-friendly tourism, minimizing the negative environmental impacts of traditional tourism and fostering community engagement in marine conservation (Jones & Phillips, 2018). Moreover, the second pillar of the Blue Economy focuses on the efficient management of environmental externalities associated with the ocean. It is rooted in the economic theory of environmental economics and emphasizes the need to internalize external costs and benefits associated with marine activities. Two significant aspects of this theory are ecotourism and sustainable fishing.

Ecotourism theory posits that tourism activities can be environmentally responsible and contribute to conservation efforts. It emphasizes the importance of preserving natural habitats and wildlife while providing sustainable livelihoods for local communities (Boo, 1990), while Sustainable fishing theory

underscores responsible fishing practices that ensure the long-term viability of fish stocks. It focuses on regulations, quotas, and conservation efforts to maintain aquatic resources while minimizing negative environmental impacts (Garcia & Cochrane, 2005). Both ecotourism and sustainable fishing incorporate economic incentives and market mechanisms. Ecotourism aims to create economic value through nature-based experiences, supporting preserving natural environments. Similarly, sustainable fishing involves market-driven practices that align economic interests with environmental goals (Pauly et al., 2005).

While environmental and marine sustainability theories and the efficient management of environmental externalities theories offer distinct perspectives, they often overlap and complement each other. Successful implementation requires navigating challenges such as policy coordination, monitoring and enforcement, and balancing economic and ecological goals (Khan et al., 2018). However, these theories provide a holistic framework for sustainable Blue Economy development, emphasizing the responsible and efficient use of marine resources while safeguarding ecosystems and supporting economic growth (Wangel et al., 2018).

2.2. Empirical Review

The regional integration, blue economy, and economic growth nexus are crucial for the national development of the island and coastal nations. In this regard, some studies have used different methods to address specific components within the blue economy.

Willie (2019), for example, applied a quantitative approach in assessing the potential impact of the development of a blue economy in Kenya as a tool to guide public policies oriented toward economic growth. This study utilizes data from different sources based on ten variables with 56 observations quarterly from 2005 to 2018. The blue economy sectors considered a priority for this study include fishery, tourism, energy, maritime transport, and shipping. Databases of national and international organizations provided the data required for this study. A multiple regression model was applied to understand the effect of blue economy activities on GDP. Electricity production, revenue generated from hotels, and export of coffee were the variables that affected the GDP the most. In other words, the growth of the Kenyan economy should keep those three blue economy sub-sectors into account. However, developing intensively those three sub-sectors might have some drawbacks to the environment, namely the marine environment. Producing more coffee would decrease the price, which won't translate into economic growth. On the other hand, it also depends on different factors, including environmental conditions or new countries entering the market. Therefore, the need for diversification from a predominantly agricultural-based to other aspects of the blue economy can enhance economic growth in Kenya.

In a similar study, Appiah et al. (2023) studied blue economy investment and sustainability of Ghana's territorial waters to develop an integrative model to enhance blue economy integration through Sustainable Supply Chain Performance. This national study surveyed 500 small and medium-sized enterprises (SMEs) in Ghana with the Structural Equation Model used in analyzing the data. This study found that organizational factors, technological factors, and the regulatory environment are significant determinants of Ghana's blue economy integration (BEI). This suggests that process regulation effectiveness is crucial in BEI. Additionally, the study has revealed that supply chain risk, green

environmental awareness, and perceived cost are significant determinants of BEI, suggesting that resource ownership and capabilities are essential considerations in BEI. Lastly, the study recommends that investment decisions in Ghana's blue economy should consider organizational factors, technological factors, supply chain risk, green environmental awareness, perceived cost and environmental awareness, and regulatory environment to achieve sustainable development.

Drawing on qualitative interview data, Ayilu et al. (2023) examine the relationship between small-scale and industrial fisheries in Ghana using political ecology and sustainable livelihood approaches, outlining the experiences, perspectives, and narratives of the small-scale fishing actors in Ghana. A mixed method approach was used in collecting the data over six months, including interviews, surveys, key informants, and focus group discussions. The qualitative data analysis software NVIVO 12 was used to analyze the data. This study found that fishery stocks have witnessed a consistent decline due to an increase in industrial fishing vessels, affecting the livelihood of coastal communities that depend on the blue economy. Small-scale fisheries households that were economically secure are now poorer than the average household in Ghana's coastal region. The decline of small-scale fisheries has impacted the organization and interactions of Ghana's coastal fishing communities, both at the state level and within the local communities. Though a closed fishing season for both the industrial fishing fleet and small-scale fishing in Ghana has been put in place, strict enforcement is essential in allowing adult fish to spawn and increase their production.

Babatunde et al. (2021) researched key aquaculture players in the African continent based on a quantitative SWOT analysis. Four countries producing substantial quantities of the total fish production from the region were considered in this study, including Egypt, Nigeria, Uganda, and South Africa. Data collection was based on secondary sources from each case study country, mainly from national reports. The internal and external SWOT assessment weighted mean values of Egypt, Nigeria, Uganda, and South Africa were statistically compared using a one-way analysis of variance (ANOVA).

The position of Egypt in the SWOT quadrant places it in a better position than Nigeria, Uganda, and South Africa because of its competitive strengths and opportunities, thus responsible for the development and production output of its aquaculture sector. Nigeria has Africa's highest aquaculture development and market opportunities due to its substantial demand-supply gap. Still, it needs to address its weaknesses to maximize its opportunities fully. Uganda's position indicates low competitive strengths and market development opportunities; however, the Ugandan aquaculture sector faces minimal threats compared to South Africa. South Africa's aquaculture sector shows some levels of competitive strengths but with minimal market and aquaculture development opportunities due to combinations of internal and external SWOT factors such as sub-optimal environmental conditions, bottlenecked permitting processes, low per capita fish consumption, and others. Therefore, developing sustainable aquaculture must consider each country's unique circumstances and challenges, even with a framework for regional integration.

Hammoud et al. (2022) carried out a study to measure the impact of the blue economy on economic growth among selected European countries from 2010 to 2019. They focused on eleven European countries with the relevant data needed for this study. A multiple regression model was used in the analysis, in which the dependent variable, economic growth, was expressed as a function of gross domestic product (GDP). On the other hand, the independent variables were relevant blue economy variables such as fish production and export of goods through the ports. The main finding of this study

is that the total fish production and the total goods transported through the ports positively impact economic growth in the short term. In the long run, the total fish production will negatively impact economic growth, while the total goods transported through the ports will positively impact economic growth. Therefore, policies and strategies for sustainable fishery management are crucial among these countries.

It's important to note that fewer studies have been conducted on this topic. Though a few have used a qualitative approach in understanding the impact of the blue economy on economic growth, quantitative methods have been the dominant. The technique used in the current study is inspired by Hammoud et al. (2022), which was based on a similar methodology. What is lacking from most of the studies is combining both qualitative and quantitative methods, which is the strength of the current research based on a mixed-method approach.

3. Data, Methodology and Analytical Framework

Given the focus of this research on the role of regional integration on BE development in Seychelles with an emphasis on the fisheries, tourism, and employment sectors, a wide range of data is needed. The researcher gathered

Information was gathered on relevant BE variables from the World Bank on gross domestic product (GDP) and the liner shipping connectivity index (LSCI). Several national institutions in Seychelles such as the Seychelles National Bureau of Statistics, the Ministry of Employment Immigration and Civil Status, the Ministry of Fisheries and Blue Economy, and the Ministry of Investment, Entrepreneurship, and Industry provided data on fish production, employment, arrival of tourist, and export of goods via Port Victoria. A stratified sampling method with specific criteria complemented the secondary data collected for this study based on key informant interviews.

The study adopts a mixed-method approach based on qualitative and quantitative research methods. Although the basis of the study is grounded in quantitative methods in understanding the role of regional integration towards BE development, qualitative information, especially from key informants, can better explain some of the quantitative results. Historical data are vital in understanding trends and patterns over time, and qualitative data can easily be used in the descriptive analysis to identify the relationships (Havard Business School, 2021), in this case, between regional integration and BE development in Seychelles.

3.1. Data

3.1.1. Qualitative data

The key informants included those in senior management positions at the Ministry of Foreign Affairs, the Ministry of Fisheries, the Tourism Department, and the Employment Department. A semi-structured interview technique was applied to the relevant stakeholders. This approach was chosen because a significant benefit is that participants are more likely to express their views openly (Flick, 2009). To maintain anonymity among the respondents, each interviewee was assigned a code. Interviews lasted

30- 60 minutes and were conducted in English and Creole. These interviews took place from October to November 2023. The interview is based on the following qualitative questions:

i. What do you understand as the Blue Economy in the context of Seychelles?

ii. In your words, what is regional integration? Provide examples of countries that benefit from Seychelles' Blue Economy.

iii. What is your opinion concerning the role of regional integration towards fisheries exports, the number of tourist arrivals, and employment in the blue economy in Seychelles?

iv. Has regional integration provided opportunities for BE development in Seychelles?

v. Are you aware of any challenges faced by Seychelles regarding regional integration in its BE development?

vi. What strategies can the government take to enhance the benefits of regional integration towards the BE development in Seychelles?

3.1.2. Quantitative Data

Independent Variables and the description:

This study focuses on the impact of the blue economy on economic growth within the context of regional integration. Therefore, crucial blue economy variables likely to strengthen regional integration were considered for this study. These independent variables include the following: i) total fish production, ii) export of goods through the Port of Victoria, iii) Liner Shipping Connectivity Index (LSCI), iv) employment of foreign workers in the blue economy, and v) tourist arrivals in Seychelles (see Table 1).

Table 1. Description of the Variables Used in the Analysis

Variable	Description	Source
lnGDP	Log of Gross Domestic Product (GDP) from 2005 – 2022	Seychelles National Bureau of Statistics
lnTFP	Log of total fish production between 2005 and 2022	Seychelles Fishing Authority (SFA)
lnExp	Log of export of goods via the Port of Victoria (2005 and 2022)	Seychelles Fishing Authority (SFA)
LSCI	Liner Shipping Connectivity Index (LSCI)	https://data.worldbank.org/
EmployBE	Employment of foreign workers in the Blue Economy	Department of Immigration & Civil Status
lnTA	Log of tourist arrival between 2005 – 2022	Seychelles National Bureau of Statistics

Dependent Variable and its description:

Given that this study seeks to understand the contribution of regional integration towards economic growth within the blue economy sector in Seychelles, the dependent variable of economic growth expressed as GDP was used (Table 1). The choice of this variable aligns with the overall vision of the Seychelles Blue Economy Roadmap in advancing the nation's economic prosperity through the sustainable development of its blue economy (Republic of Seychelles, 2018).

An increase in a country's GDP is a sign of economic prosperity, and that of Seychelles is presented in Figure 11. Between the period considered for this study, Seychelles recorded its lowest GDP in 2009, corresponding to USD 9,749, accompanied by a -13.46% annual growth rate (Figure 1). This decrease

is attributed to the 2008 financial crisis that affected the country with a depletion of its foreign reserves. The number of tourist arrivals decreased substantially while unemployment rates heightened. Despite the drop in the GDP, which began in 2007 and hit a bottom low in 2009, the GDP witnessed an increasing trend between 2009 and 2019.

Figure 1. Seychelles GDP per capita in USD between 2005 and 2022

3.2. Descriptive Statistics Analysis

The descriptive statistics provide a summary of the statistics that describe the quantitative data from national and international organizations used in this study, as shown in Table 1. Specifically, it covers the mean as a measure of central tendency and the standard deviation. The mean is the average or the most common value in a collection of numbers. It measures the central tendency of a probability distribution along median and mode. Standard deviation (SD) measures the variation or dispersion of a set of values – in this case, the variables presented in Table 2. A low standard deviation indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range.

Table 2. Descriptive Statistics of All the Variables Considered in the Study

Variable	Obs.	Mean	STDEV	Max	Min
Gross Domestic Product in $ (GDP)	18	13553.56	2124.73	16851	9749
Export of goods in $	18	1146682676.86	289646361.81	1619734302	742270005.2
Fish production in MT	18	326806	96094.08	470012	144265
Liner Shipping Connectivity Index (LSCI)	18	8.04	1.54	10.59	4.9
Tourist arrivals	18	418427.22	803362.13	3619000	104213
Employment of foreign workers in the BE	18	414.28	379.53	961	0

3.3. Model Specification

Multiple Regression is a step beyond simple regression. The main difference between simple and multiple regression is that multiple regression includes two or more independent variables – sometimes called predictor variables – in the model rather than just one. An initial analysis showed that just one of the independent variables was significant. Therefore, the Liner Shipping Connectivity Index (LSCI) and tourist arrival were dropped. Since three independent variables were applied in the current study (see Table 1), using a multiple regression model is more appropriate. The model for the analysis inspired by Hammoud et al. (2022) is written as follows:

$$LogY = \beta_O + \beta_1 LogX_1 + \beta_2 LogX_2 + \beta_3 LogX_3 + e \qquad\qquad \text{Eq. 1}$$

The dependent variable Y represents gross domestic product, which is computed for the years 2005 to 2022.

The independent variables included in the model are

X_1, the total fish production in metric tons

X_2, export of goods via the Port of Victoria

X_3, employment of foreign workers in the blue economy

And β_O represents the parameter of the fixed section or term in the model, and the GDP means the absence of the influence of all independent variables in the model $\beta_1, \beta_2, \beta_3$. The model's parameters measure the effect of the independent variables consecutively on the gross domestic product. The error term variable in the model that represents all the variables not measured or not entered in the form is denoted as *e*.

3.4. Diagnostic tests

3.4.1. Checking for Multicollinearity

The correlations between the five independent variables used in the model. Two essential values are Tolerance and the variance inflation factor (VIF) to check for multicollinearity. Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model. It is calculated using the formula I – R squared for each variable. The standard rule is that if this value is minimal (i.e., <0.10), it indicates that the multiple correlation with other variables is high, suggesting the possibility of multicollinearity.

The other value given is the variance inflation factor (VIF), the inverse of the Tolerance value (i.e., one divided by Tolerance). Results with VIF values that are ten and above are of concern, given that they are indicative of multicollinearity. Therefore, the cut-off points for determining the presence of multicollinearity will include a Tolerance value of <0.10 and a VIF value of 10 and above. The results presented in Table 3 show that the tolerance value for each independent variable is at least 0.4 and above, while the highest VIF value is approximately 2.5, which is way below the cut-off of 10. Therefore, the results do not violate the multicollinearity assumption.

Table 3. Checking the Assumption of Multicollinearity Based on Tolerance and VIF

Variables	Tolerance	VIF
Log of total fish catch	0.798	1.263
Log of export via Port of Victoria	0.403	2.479
Employment of foreign workers in the BE	0.455	2.198

Source: Authors compilation from SPSS (2023)

The correlation matrix presented in Table 4 highlights that there is no significant bivariate relationship in any of the independent variables and so supports the results from the variance inflation factor that there is no multicollinearity.

Table 4. Correlation Matrix for the Multiple Regression Model

Variable	(1)	(2)	(3)	(4)
(1) Log of GDP	1.000			
(2) Log of total fish catch	.879	1.000		
(3) Log of export via Port of Victoria	.791	.738	1.000	
(4) Employment in the BE	.535	.731	.453	1.000

Source: Authors compilation from SPSS (2023)

4. Findings and Discussions

4.1. Validity of the Model and Descriptive Statistics

4.1.1. Evaluating the Model

An essential piece of information in evaluating the model fit is the R square value, which provides information on how much of the variance in the dependent variable is explained by the model. In this case (Table 5), the value is .821, which means that the model explains 82.1% of the variance in economic growth expressed as gross domestic product. It should be noted that the R square value might be overestimated with small sample sizes, just like in the current study. Therefore, the adjusted R square value provides a much better estimate; in this case, it corresponds to 78.2% (Table 4).

Table 3. Model Summary of the Multiple Regression

Model Summary[b]

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.906[a]	.821	.782	991.569

a. Predictors: (Constant), Log of total fish catch, Employment of foreign workers in the BE, Export through Port of Victoria
b. Dependent Variable: Gross Domestic Product

To assess the statistical significance of the result, it is necessary to look at the ANOVA result presented in Table 6. This tests the null hypothesis that multiple R in the population or sample equals 0. The model in this example (see Table 6) reaches statistical significance, implying that p<.005.

Table 4. ANOVA Result of the Multiple Regression

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	62981004.932	3	20993668.311	21.352	.000ᵇ
1	Residual	13764913.512	14	983208.108		
	Total	76745918.444	17			

a. Dependent Variable: Gross Domestic Product
b. Predictors: (Constant), Log of total fish catch, Employment of foreign workers in the BE, Export through Port of Victoria

4.1.2. Evaluating Each of the Independent Variables

The output labelled Coefficient (Table 7) provides information on which of the variables included in the model contributed to the prediction of the dependent variable – in this case, economic growth expressed as GDP. Tourist arrivals and LSCI were dropped from the model to ensure that most of the variables included are significant. To compare the different variables, focusing on the standardized rather than the unstandardized coefficients is essential. The standardized coefficients imply that values for the other variables have been converted to the same scale to allow for comparison. In this case, the point of interest is comparing the contribution of each independent variable based on the values in the Beta column. The largest Beta value (ignoring any negative signs) is the variable that makes the strongest unique contribution to explaining the dependent variable. Therefore, the Beta coefficient of 0.681 for exporting goods through Port Victoria had the highest value (Table 7). The Beta value for fish production was the smallest (-.070), indicating that it made the least of a unique contribution.

Table 5. Coefficients Derived from the Multiple Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	11539.871	7636.580		1.511	.153
	Export through Port of Victoria	.000	.000	.681	3.823	.002
1	Employment of foreign workers in the BE	1.736	.939	.310	1.848	.005
	Log of total fish catch	-347.179	629.274	-.070	-.552	.590

a. Dependent Variable: Gross Domestic Product

4.1.3. Descriptive Statistics

For all the variables used in the model, descriptive statistics are presented in Table 8, covering the time-series data for the eighteen years (2005 to 2022). The standard deviation (or σ) measures how dispersed the data is concerning the mean, with the export of goods through Port Victoria having the largest standard deviation (Table 8). Such a figure indicates that the data are more spread out, given that there were years with relatively higher and lower export of goods. Even with the log values of some of the variables, this same pattern was observed for variables such as tourist arrivals and gross domestic product.

Table 6. Descriptive Statistics of the Variables Used in the Model

Descriptive Statistics

	Mean	Std. Deviation	N
Gross Domestic Product	13553.56	2124.727	18
Export through Port of Victoria	1146682676.89	289646361.750	18
Employment of foreign workers in the BE	414.28	379.534	18
Total Fish Catch	326805.72	96094.124	18

4.2. Impact of Regional Integration on Economic Growth

Of all the variables used in the model, the test result demonstrated that just one independent variable made a significant unique contribution to the prediction of economic growth, expressed in the form of gross domestic product. As such, employment of foreign workers in the blue economy and the export of goods via Port Victoria are both significant at the 5% level (Table 9). This result shows that regional integration contributes to economic growth, with the blue economy of Seychelles as an essential driver.

Since the coefficient estimates for four independent variables were not statistically significant, the focus will be on the significant one. The coefficient estimate for employment of foreign workers in the blue economy sector in Seychelles demonstrated (1 - .001 = 0.939) a 93% of predicting economic growth (Table 9). The proceeding section considers each of the variables used in the model and how they have contributed towards economic growth in the Seychelles.

Table 7. Multiple Regression Analysis Determining the Effect of GDP on the Independent Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	11539.871	7636.580		1.511	.153	-4838.964	27918.707
	Export through Port of Victoria	.000	.000	.681	3.823	.002	.000	.000
	Employment of foreign workers in the BE	1.736	.939	.310	1.848	.005	.279	3.751
	Log of total fish catch	-347.179	629.274	-.070	-.552	.590	-1696.837	1002.480

    a.   Dependent Variable: Log of GDP

4.3. Impact of Regional Integration on GDP

Gross Domestic Product (GDP) plays a crucial role in a country's economic growth. In the case of Seychelles, the highest annual growth rates were recorded for 2013 and 2022, standing at 19.34% and 22.46%, with corresponding GDPs of USD 14,730 and 15,875, respectively. In 2020, the highest negative annual growth was recorded at -28.67% despite a GDP of USD 12,020. This was the impact of the COVID-19 pandemic in which the main pillars of Seychelles' economy (tourism and fisheries) were significantly affected – an indication that regional integration and globalization impact GDP.

Another contributor to GDP is foreign direct investment (FDI). Foreign direct investment (FDI) net inflows are the value of inward direct investment made by non-resident investors in the reporting economy. Different economies have different goals in emerging foreign direct investment flows. Undoubtedly, FDI is a significant contributor to the economic development of emerging economies, especially for countries in the Global South with investment opportunities (Echandi & Sauvé, 2013). Inward FDI occurs when an overseas firm has a controlling interest in a new or existing business in an economy other than the investor firm. Different countries may have varying controlling interests. The FDI inflows stimulate domestic investment because the domestic producers will be motivated to improve the quality of the goods and services produced to compete in the market (Yusheng et al., 2019). It has been established that foreign direct investors use raw materials, auxiliary materials, or services from the host country, positively affecting local businesses.

The findings from various studies, including one that examined the impact of different factors—economic, demographic, and institutional—on global and social fiscal pressure across 38 states from 2000 to 2017, using statistical models like ordinary least squares (OLS), panel-corrected standard errors in linear regression, and first difference generalized method of moments (GMM) with robust standard errors and orthogonal deviations, highlighted the significance of demographic and institutional elements in identifying variables influencing global or social fiscal pressure (Nuta & Nuta, 2020), additionally the study investigated India's carbon dioxide emissions from 1970 to 2020 using advanced statistical methods found a long-term relationship among factors influencing emissions, such as GDP per capita, uncertainty, globalization, energy use, and population density. India showed an inverted U-shaped pattern (EKC) between GDP per capita and CO2 emission, this can be useful when evaluating and drafting regional blue economy framework. As it was stated that an increased in uncertainty leads to more environmental damage, while globalization has a negative impact on long-term environmental degradation. Moreover, higher energy consumption and population density contribute to increased CO2 emissions. It was suggested that promoting trade openness as a policy to address these environmental concerns similarly to promoting Regional integration for the success of blue economy.

4.4. Impact of Regional Integration on Fish Production

According to data made available by the Seychelles Fishing Authority (SFA), the average quantity of fish production in Seychelles water was 326,806 MT. The maximum year for fish production was 2018, with a figure of 470,012 MT, while the least recorded year was 2007, with just 144,265 MT (Appendix 1). The government of Seychelles has signed over four fishing partnership agreements with the European Union, Mayotte, Taiwan, Mauritius, China, and Korea. While some of the EU-Seychelles partnership has had a longstanding relationship for over two decades, most other agreements have occurred during the last decade, impacting fish production. Therefore, the higher the number of foreign and local vessels in the Seychelles EEZ, the larger the fish production. Information gathered from the Seychelles Fishing Authority (SFA) shows an increasing trend of fish caught, highlighting the importance of regional integration towards fish production and, by extension, economic growth.

Furthermore, following the significant development of the industrial tuna fishery since the late 1990s, the Seychelles have produced a considerable quantity of fish. According to FAO FishStat, the tuna catch by Seychelles flagged vessels has varied between 70,000 MT and 80,000 MT since 2009 (Appendix 1).

Production from the artisanal and semi-industrial fleet has been stagnating around 3,000 MT per year in recent years. It should be noted that there is a strong seasonal pattern to artisanal fisheries catches in Seychelles, with catches tending to be highest around the inter-tropical monsoon periods of March-May and October-November when sea conditions are most conducive to fishing (Failler et al., 2011).

Seychelles is also a major seafood processing hub. In 2019, the export of consumable fish and fish products comprised 90% of its total value of domestic exports. Additionally, exports in Seychelles averaged 40.88 million USD from 2005 until 2023, reaching an all-time high of 82.51 million USD in March 2019 and a record low of 7.83 million USD in January 2021. Fisheries companies include Oceana Fisheries, Amirante Fisheries, and retailers like Fishtech. The Seychelles Fishing Authority (SFA) regulates and promotes the sustainable development of the local fisheries sector.

4.5. Impact of Regional Integration on Export Via the Port of Victoria

Aside from the employment of foreign workers in the BE, another variable that was significant at the 5% level is the export of goods through Port Victoria. The Seychelles Ports Authority (SPA) was established in October 2004 by the SPA Act (2004). This followed a Government decision to adopt a business-oriented approach towards running the ports for better management of all port-related activities. Port Victoria is situated on the northeast coast of Mahe Island and is the main port for importing and exporting goods in the maritime space of Seychelles. An estimated number of 850 vessels visit the port annually, and the export of goods is approximated annually at 15,000t of general cargo and 70,000t of fish. Appendix 2 highlights the total export of goods through the Port of Victoria annually in USD. Between 2005 and 2022, there has been an increase in the export of goods, except during 2019 and 2020, due to the impact of the COVID-19 pandemic.

The production and export of fish and fishery products, particularly canned tuna, constitute an essential economic activity for the Seychelles. Other fish products include fresh and frozen fish (including tuna loins), dried shark fin and sea cucumber, fish meal, and fish oil. In 2009, the Seychelles exported a total of 47,500 MT valued at about US $210.2 million, according to FAO FishStat data. EU markets are the leading destination, and the export of canned tuna to the EU represented 31,283 MT in 2011, for a total value of about US $240 million (John and Javier, 2013).

4.6. Impact of Regional Integration on LSCI

Though this variable wasn't significant, it is essential towards the development of the BE. The Liner Shipping Connectivity Index (LSCI) captures how well countries are connected to global shipping networks. The LSCI aims to capture a country's integration level into global liner shipping networks. In interpreting the index, the higher the value, the better the nation's connectivity and vice versa. In the case of Seychelles, the index value generally increased between 2005 and 2020 despite some decreases that did not go below 8 (Appendix 3). Better connectivity into the global shipping networks also enhances integration and trade. Therefore, a country's access to world markets depends mainly on its transport connectivity, especially regarding regular shipping services for importing and exporting manufactured goods.

4.7. Impact of Regional Integration on Employment in the BE

The employment of foreign workers was significant at the 5% level, contributing to economic growth. Information from the Department of Immigration and Civil Status in Seychelles shows that most employment in the blue economy sector emanates from tourism. The figures ranged from 1000 foreign workers in 2016 to as low as zero between 2005 and 2009 (Appendix 4). During the stakeholder interview with the Department of Immigration, it was mentioned that the years with zero foreign workers did not mean they weren't working in this sector. Still, disaggregated data as per profession were not collected at that time.

Employment in the fishery sector for foreign workers increased steadily from 2009 to 2022, though the annual figure hardly exceeded 200 workers. Some foreign workers in the fishery sector work in the tuna canning factory, while others work on foreign vessels that have signed a partnership agreement with the Government of Seychelles. The total employment in the blue economy sector is similar to that of the tourism sector – an overwhelming dominance of this sub-sector within the BE.

Moreover, tourism and fisheries are the primary sources of employment, providing formal employment for at least 26% and 17% of the population, respectively (Hindle, 2019). These sectors are also significant contributors to GDP, with tourism contributing directly and indirectly 55% and fisheries constituting 20%, while fisheries are responsible for ~93% of the nation's exports (Hindle, 2019). The Seychelles Ministry of Home Affairs, Immigration, and Civil Status has the Gainful Occupational Permit (GOP) that allows foreign workers to participate in gainful employment in Seychelles. Most GOP holders are in the tourism sector, followed by the fisheries sector. The overwhelming number in the tourism sector is linked to two issues. Firstly, some tourism establishments are multilateral and have to move staff around different branches. Secondly, greater staff diversity in the hotel industry can easily cater to the needs of tourists from across the world's continents. Seychelles has signed over four partnership agreements for the fishery sector that allow foreign vessels to fish in its water.

4.8. Impact of Regional Integration on Tourist Arrivals

Though this variable wasn't significant, tourism plays a major role in economic growth in Seychelles and is the main pillar of the economy. Visitors to the Seychelles do not need any visa before they arrive in the country, and the attractiveness of the Island State has witnessed huge numbers of tourist arrivals. The number of tourists that came to Seychelles in 2005 was 128,654, rising to over 350,000 in 2019 (Appendix 5). The impact of the COVID-19 pandemic is evident, with a drop in the number of tourists between 2019 and 2020 and a recovery in 2021. Most tourists arriving in the country are from across the European Union. Seychelles has also established a visa-free agreement with over 100 countries, highlighting the country's partnership with other nations.

5. Conclusion

This study assesses the impact of the blue economy on economic growth in the context of regional integration. The test result of all the variables used in the model demonstrated that two of the three independent variables (employment of foreign workers in the BE and export of goods via Port Victoria) uniquely contributed to the prediction of economic growth expressed in gross domestic product. Total

fish production was the only variable that was not significant. However, it was found that FDI also contributed to Seychelles' GDP, given that most of the investments occur in the tourism sector, further creating employment for local and foreign workers. The fishery sector also benefits from the tourism establishment as they provide a ready market for fish products for tourists whose numbers have grown over the years.

5.1. Major Contributions

The first significant contribution of the current research is addressing this knowledge gap on the impact of the Seychelles blue economy on economic growth within the framework of regional integration. Exporting goods via Port Victoria and employing foreign workers in the blue economy contributed significantly to economic growth in the Seychelles. With a population of 100,000 (approximately 30% foreign workers), Seychelles, like other SIDS, faces a crucial challenge regarding human resource capacity. Gaps in human resource capacity are often filled with foreign workers, some of which are part of a partnership agreement the Government of Seychelles has with other countries within the African continent. The volume of goods exported via Port Victoria, the main port in Seychelles, also demonstrated its role in economic growth. Therefore, maintaining and improving the port infrastructure is essential for sustainable economic growth.

Another contribution of this study is the mixed method approach in which quantitative data were considered alongside qualitative data from key informants. Empirical studies revealed that most studies applied either method without using both together. While such approaches have merits in achieving the objectives of these studies, applying quantitative and qualitative methods is a step further that can provide a better interpretation of quantitative data and vice versa. For example, data on foreign workers in the blue economy showed that between 2005 and 2009, the figure stood at zero. Based on key informant interviews with the Department of Immigration and Civil Status, it was found that gainful occupational permit (GOP) for foreign workers was more general and did not include their specific sector of employment. However, improvement in the system saw some changes in which, from 2009 onward, sector-specific information was included in the GOPs, allowing for disaggregated data across sectors. Without qualitative details in this study, it could have been interpreted that there weren't any foreign workers in the blue economy sector before 2009, which could have been misleading.

Lastly, fish production increased between 2005 and 2022, but this variable didn't significantly predict economic growth. On the other hand, the number of fishing partnership agreements has increased amidst semi-industrial and artisanal fishing carried out by local fishermen. Therefore, an important area that the Seychelles Fishing Authority should focus on is illegal, unreported, and unregulated (IUU) fishing.

5.2. Limitation of the study

While this study provides baseline information on the impact of the blue economy on economic growth based on important BE variables with a regional integration dimension, some limitations exist.

Firstly, the study focuses on a single case study, Seychelles, and references essential variables relevant to regional integration. However, focusing on a regional bloc such as the COMESA or SADC, of which

Seychelles is a member state, could have provided a better insight on the topic and harness the power of regional integration.

Secondly, the lack of data was another constraint for this study. For example, Seychelles became a high-income country in 2015, and information on poverty is lacking, given that the available poverty report does not reflect the country's local reality. The UNDP poverty index is unsuitable for Seychelles and cannot be used, though it is available. The Seychelles Social Security System provides all Seychellois access to free health and education. Those who are unemployed are supported financially by the Government of Seychelles. Therefore, the poverty rate is even missing in the UNDP database for Seychelles, with information only for two years between 2005 and 2022. It was also challenging to find information on inequality, which is essential when assessing economic growth.

Lastly, enough time wasn't available for a comprehensive literature review. This was further compounded by the lack of access to recent journal articles, as most were not open access. Therefore, the study had to use older literature in some instances, though recent literature exists but is not open access. Additionally, some of the key informants for the qualitative interviews complained about the timing of the data collection. While most of those from Government Ministries, Departments, and Agencies (MDAs) were planning their budget for the next financial year, others were preparing documents for the UN Climate Change Conference.

### 5.3. Recommendations and Suggestions for Future Research

Guided by the current study and the researcher's experience in producing this dissertation, some recommendations can help foster regional integration and drive economic growth and sustainable development.

The first recommendation will be to review all the partnership agreements Seychelles has signed with neighboring countries or other partners. Such a review should be guided by scientific data of activities occurring within the blue economy. For example, harvesting fishery stocks is faster than the replenishment rate, which is already a concern among small-scale fishers in the Seychelles.

Policies and partnership agreements should be relooked to provide a win-win between the parties and ensure the sustainability of BE resources. Having a regional framework for Blue Economy development can be an entry point. For example, a regional BE framework for the Western Indian Ocean country and also among the SIDS and the inland countries within the continent.

A national study on poverty in Seychelles is needed to have recent and up-to-date information on issues around inequality. Such a study is crucial because addressing inequality is among the SDGs, which, if ignored, might compromise the attainment of sustainable growth.
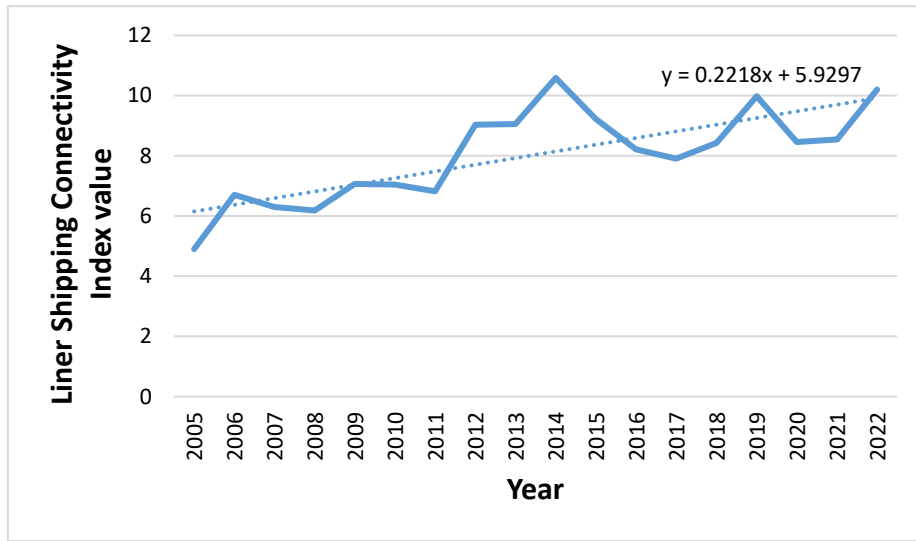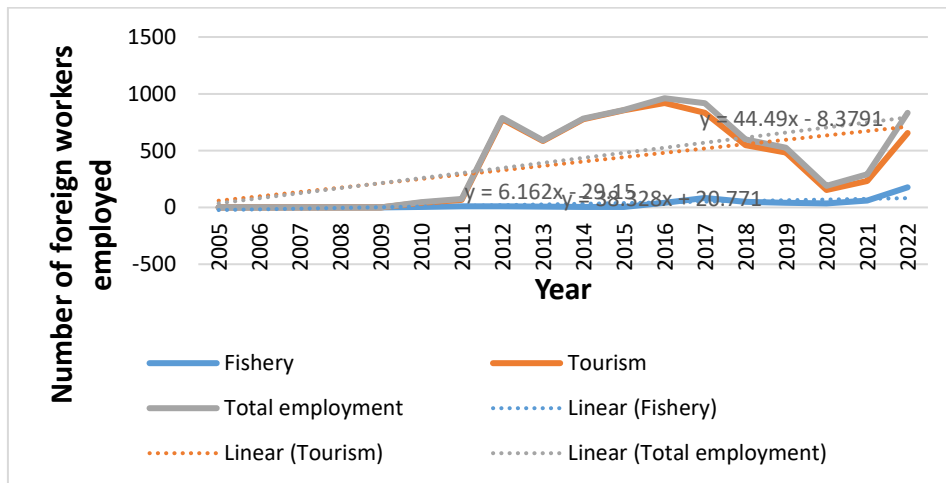
Appendixes
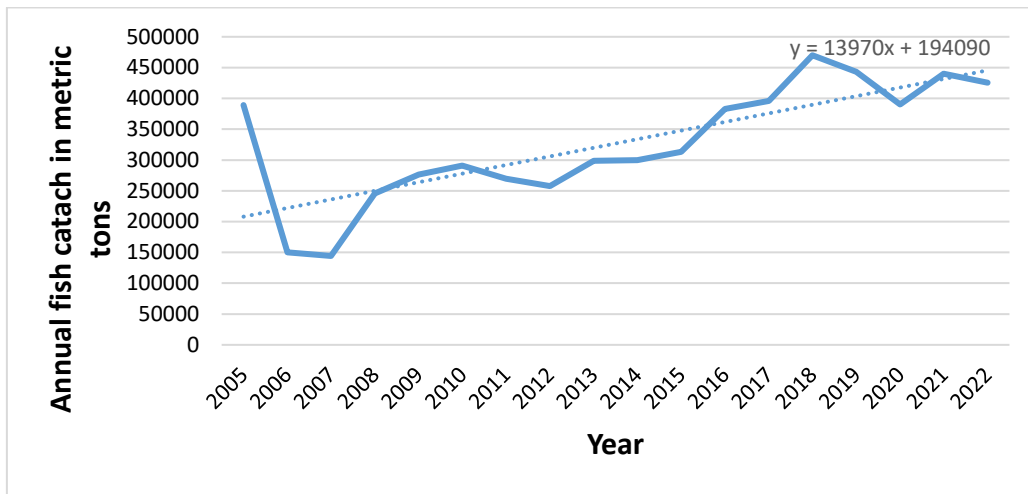
Appendix 1. Total Fish Catch (MT – Metric tons) in Seychelles between 2005 and 2022
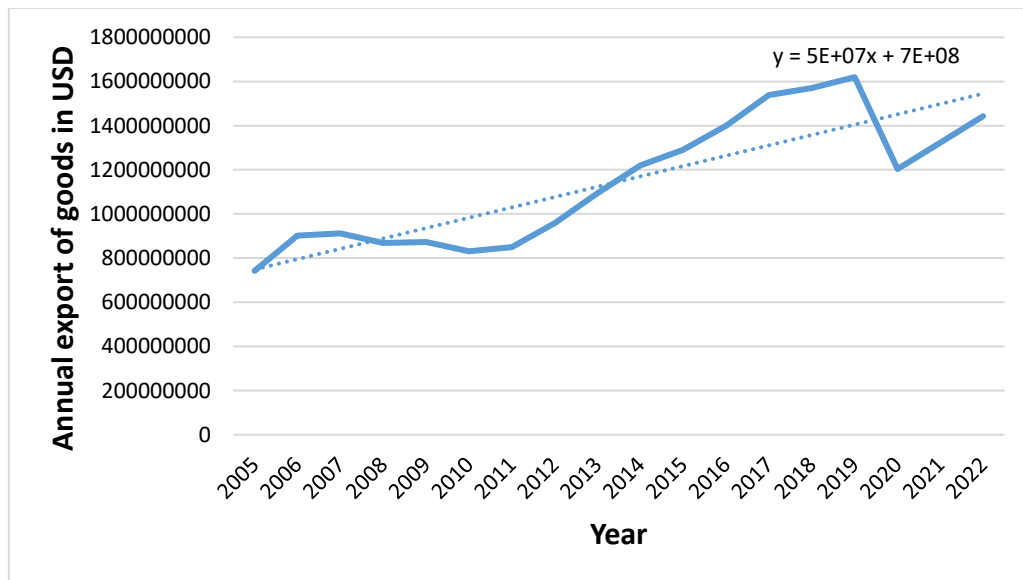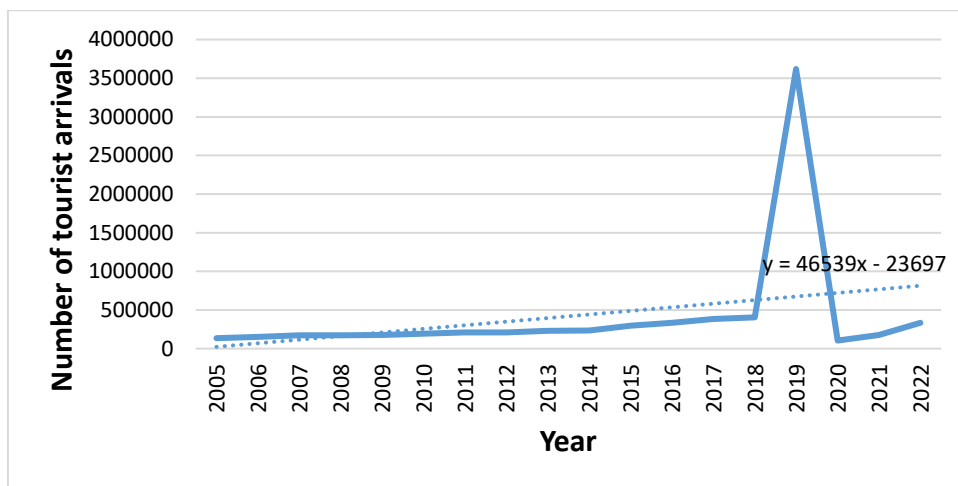

Appendix 2. Total Export of Goods through the Port of Victoria in Seychelles between 2005 and 2022

Appendix 3. The Liner Shipping Connectivity Index for Seychelles between 2005 and 2022

Appendix 4. Total Number of Foreign Workers Employed in Seychelles BE between 2005 and 2022

Appendix 5. Total Number of Tourist Arrivals in Seychelles between 2005 and 2022

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