Survey of Perceptions on Ocean Governance, Fisheries Management and the Blue Economy

SWIOFISH 3

UNIVERSITY OF SEYCHELLES

Knowledge hub of the Indian Ocean

Final Report:

Survey of Perceptions on Ocean Governance, Fisheries Management and the Blue Economy

SWIOFish3

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Executive Summary

This project to undertake a nationally representative survey of the Seychellois public's perception of ocean governance, fisheries management and the Blue Economy was commissioned by the Department of Blue Economy in the Ministry of Fisheries and Blue Economy, Seychelles. The project used random sampling to conducted a statistically robust survey experiment across the three most inhabited islands in Seychelles, namely Mahé, Praslin and La Digue. There were 730 surveys collected, of which 674 were usable, resulting in a high response rate of 92%.

After the iterative process of developing the survey, which comprised a literature review, internal scrutiny and two focus group discussions, the survey was piloted, reviewed and finalised. A group of 10 enumerators that comprised University of Seychelles' Environmental Science students and one alumnus were trained to conduct the survey as objectively and unbiased as possible. The surveys were conducted primarily on weekends upon recommendation from the focus groups and respondents. Kobo Toolbox and its Android application were used to collect the data. All 26 of Seychelles' recognised districts were sampled during the survey period in an attempt to represent any geographic variance, whilst also stratifying the sample according to age and sex.

The survey revealed that over 89% of respondents used TV as their source of information and news, and that 74% of respondents used two sources. In Seychelles, the Blue Economy is a well-known concept that 93% of respondents had heard of. However, self-reported knowledge of what it is, is low (12% of respondents). The Seychelles Marine Spatial Plan (SMSP) initiative and the increased area of marine protected areas in Seychelles are poorly understood, with 45% of respondents having heard of the SMSP and only 18% knowing that Seychelles has protected 30% of its waters.

The two primary indicators required of the project both produced results that managers and policy makers are likely to be happy with. The respondents indicated that 77% of them were 'Satisfied' or higher with the management of Seychelles' marine protected areas and 78% were 'Satisfied' or higher with the management of Seychelles' fisheries.

There were nine recommendations made regarding this study. Aside from a focused communication strategy, the three main recommendations are: i) increased education, awareness and information on the topics of Fisheries value chains, Aquaculture and Blue Economy, ii) the results should be publicly shared with the respondents and respective Ministries, preferably through a focused media campaign to ensure awareness of the results and increase willingness of participation in future studies, and iii) media campaigns should use TV whenever budget and resources allow as it has the widest reach. If a secondary or lower cost alternative is needed, the campaign should focus on online and social media for ages 18-30 and radio for those aged 45 and older.

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Introduction

Background

Seychelles is an island nation that lies approximately 1,750 km East of mainland Africa, and is spread between 4°S and 10°S (Government of Seychelles [GoS], 2020). It is an archipelago consisting of 115 islands which are divided geographically into 'inner' and 'outer' islands, a concept that refers to their proximity to the main island, Mahé. Seychelles is the smallest country in Africa in terms of land surface area (455 km^2), yet has the continents second largest exclusive economic zone (EEZ) of 1.35 million km^2, rendering it a Large Ocean State (LOS). According to the recent population and housing census, the population of Seychelles stands at 100,477 compared to 90,945 during the 2010 census, with an increase of 9.9% (National Bureau of Statistics [NBS], 2022a). The inner islands are granitic, with the coralline exceptions of Bird and Denis Islands, and include the main island of Mahé, followed by Praslin, and La Digue (NBS, 2021a). Contrastingly, the outer islands are coralline in nature (NBS. 2021a). Almost the entire population (99.4%) of Seychelles resides on the inner islands. Mahé Island is the largest of the granitic islands (land area of 154.2 km^2) and houses the country's capital, Victoria (NBS, 2021a). It is also the economic hub of the country and contains most of the nation's critical infrastructure. Mahé Island is home to 86,962 (87.5%) of the populace, whilst Praslin has 8,807 (8.9%) people and La Digue 2,975 (3%) (NBS, 2022b).

Seychelles' economy is vulnerable to exogenous shocks due to its geographic isolation, limited land expanse and undiversified economy. It is primarily reliant on two industries: tourism and fisheries. These industries are themselves reliant on a healthy and functioning marine environment. Tourism and fisheries are responsible for at least 26% and 17% of formal employment in the country respectively (Hindle, 2019). They are also the main contributors to Seychelles' gross domestic product (GDP) where it is estimated that tourism is accountable directly and indirectly for approximately 55% of GDP and fisheries 20%. Fisheries are critical to the country's international trade, estimated to comprise ~93% of its exports (Hindle, 2019).

Historically, Seychelles has had an open access fishery, meaning few limits and constraints have been placed upon fishing activities allowing for extraction beyond sustainable limits. This is particularly the case in the nearshore artisanal and the recreational sectors. However, consistent increases in effort and fleet size, combined with the resultant effects of habitat degradation, overexploitation and climate change have led to Seychelles undergoing a transition toward a more managed approach, which includes the introduction of regulations such as bag and size limits.

Seychelles' tourism market has seen remarkable growth in the last decade. Tourism can be attributed to the country's natural beauty and its white sandy beaches, lush green interior and clear, blue ocean waters. Most recently, prior to the advent of the Covid-19 pandemic, the archipelago welcomed 384,000 tourists to its shores in 2019 (NBS, 2021b), almost four times the size of the country's population. This trend continues post-Covid with tourism arrivals recorded at 241,000 for 2022 up to the end of September (NBS, 2022c). In spite of this growth, the industry has a high reliance on the foreign work force, in spite of job availability (GoS, 2018). Tourism is inherently linked to income and economic well-being in source countries, meaning Seychelles' economy is vulnerable to the consequences of economic downturns, as experienced in the global financial crisis in 2007-2008 and the global Covid pandemic in 2020-2021 (GoS and UNDP, 2020).

The Blue Economy (BE) concept is practically synonymous with Seychelles due to it being a large ocean state and, more importantly, the huge potential it has towards the development of Seychelles

(Republic of Seychelles, 2018). Seychelles has been a proponent of the BE since it was first introduced at the Rio+20 Conference on Sustainable Development in 2012 (Republic of Seychelles, 2018). Central to the Blue Economy concept is the equitable use of a country's ocean space, or exclusive economic zone (EEZ). Thus, developing a system of understanding among users for how a country's EEZ is allocated is important for the success of its BE. Marine spatial planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives, usually specified through a political process (Ehler and Fanny, 2009). Due to Seychelles' political will, its understanding of the need to transition to a sustainable BE, and its obligation to protect 30% of its EEZ in a debt conversion agreement, Seychelles initiated a marine spatial plan (MSP). The body created to execute the plan, the Seychelles Marine Spatial Planning (SMSP) Initiative, was formed in 2014 at a time that the BE was still a new concept (Seychelles Marine Spatial Plan Initiative [SMSP], 2022).

The SMSP is a government-led initiative through the Ministry of Agriculture, Climate Change and Environment (MACCE) with technical support from The Nature Conservancy, which has been developed iteratively for the last eight years. It focuses on planning for and managing the long-term sustainable use and health of Seychelles' EEZ. The SMSP uses an integrated, multi-sector approach to address its primary objectives of climate change adaptation, protection of marine biodiversity (30% of EEZ) , and support of the BE. It has a robust stakeholder engagement framework and includes all significant sectors of Seychelles, such as commercial fishing, tourism, marine charters, biodiversity conservation, renewable energy, port authority, maritime safety, and non-renewable resources. This ensures the development of a comprehensive, stakeholder driven, marine spatial plan (SMSP, 2022). In March 2020, after six years of extensive stakeholder engagement, political discourse, scientific analysis and modelling, the SMSP achieved its third Milestone goal of having 30% of Seychelles waters gazetted as marine protected areas (MPAs), with 15% as 'High Biodiversity Protection' and 15% as 'Medium Biodiversity Protection and Sustainable Use'.

The SMSP is of great importance to Seychelles, as it seeks to balance one of the country's greatest assets, its marine biodiversity, with the multitude of extractive and non-extractive practices that take place in the marine environment. Seychelles' marine biodiversity supports several critical economic sectors, including fisheries and tourism (SMSP, 2022). Although the new MPAs were gazetted in 2020, their implementation is only set to commence in 2023, decreasing the likelihood of the Seychelles public's awareness of the 30% of MPAs currently in existence.

In the Seychelles context the BE refers to those economic activities that directly or indirectly take place in the ocean and coastal areas, use outputs from the ocean, and place 'goods and services' into ocean activities, as well as the contribution of those activities to economic growth, social, cultural and environmental wellbeing. It aims to transform economic development and human well-being through the judicious use of the resources that exist in the ocean. By conceptualizing the ocean as a development space where spatial planning integrates conservation, sustainable use, resource extraction, sustainable energy production and transport, the BE offers an alternative economic approach that is guided by environmental preservation principles. A number of related actions are already under way to effect the shift towards economic diversification and sustainable growth (Purvis, 2016).

Recent activity in BE oriented financial and administrative moves consolidate this. Seychelles' approach to innovative finance captured the world's attention when it executed its highly acclaimed debt conversion (DC) with support from The Nature Conservancy, established a public-private trust to attract international investment and to manage the proceeds from the DC, as well as issuing the world's first sovereign blue bond. In order to guide this process, a national document, the *Seychelles*

Blue Economy: Strategic Policy Framework and Roadmap 2018-2030 (Republic of Seychelles, 2018) was produced to demonstrate the country's commitment to the concept and its will to transition to more sustainable ocean use. At the end of policies and strategies are people, and consequently their actions and/or activities that yield positive or negative effects on the environment that support human's resource base. The views or perceptions of the population toward the BE are important, particularly in terms of BE development that is responsive and addresses the Sustainable Development Goals (SDGs). Therefore, this study sets out to address the objectives below.

Objectives

The specific objectives of this assignment were:

- To design and develop materials and tools for undertaking a perception survey of the ocean governance, fisheries management and development in fisheries value chains in Seychelles;
- To undertake the perception survey with the assistance of the Project Implementation Unit (PIU), analyse outcomes and produce a report with recommendations

The objectives were achieved as a result of a thorough process that developed and administered a face-to face survey with a representative sample of Seychellois on Mahé, Praslin and La Digue islands. The results of this survey are used to provide recommendations for communication and awareness to potentially increase acceptance and willingness to support and participate in governance measures.

In order to provide a product that directly addressed criteria requested by the client, the following specific indicators were included and reported on:

1. Share of citizens of the Seychelles who rate management of sustainable-use marine areas as 'Satisfactory' or above
2. Share of citizens of the Seychelles who rate management of selected fisheries as 'Satisfactory' or above

The above indicators were augmented with several others that were not specifically requested by the client, but that the client may find useful. Several of them can serve as baseline levels of information, understanding or perceptions against which future iterations of this, or a similar survey, can be compared. These include:

- Seychellois that have heard of the Marine Spatial Plan
- Knowledge of the proportion of Seychelles waters in marine protected areas
- Seychellois that have heard of the Blue Economy
- Seychellois attendance of public meetings regarding the ocean
- Knowledge of each of the different topics in the survey

In addition to those mentioned above, specific questions in the survey may be seen by the client as being possible indicators to use going forward.

Document structure:

This report is divided into six sections. The introduction sets the scene and states the specific objectives of this assignment, as well as mentioning specific additional indicators that the client can expect. The methodology outlines the approach that the consulting team used to execute the

assignment, including the logic and calculations used to estimate the sample size required. Following this, the results and discussion presents the main findings of the five core topics that the survey addressed, including a discussion that demonstrates our interpretation of the results. A communication, education and awareness chapter is introduced as a standalone section of the report, in which questions that were targeted specifically at respondent general knowledge are presented and discussed, as well as results of how respondents access their news and information. Penultimately, the challenges and recommendations that the consulting team experienced and suggest are presented. Lastly, the report is closed with a concluding chapter.

In addition to these chapters presented above, four appendices have been included to provide supplementary information that may be of value to the client.

Methodology

The overarching strategy of any research impacts the quality of data collected and the results. Several steps consistent with best research practices were employed in the current study. For best practices adopted during the research, this section will be presented across five sub-sections as follows; i) survey design, ii) focus group discussion, iii) determining of sample size, iv) training of enumerators and piloting of survey, and v) data collection and analysis.

Survey design

This study focuses on capturing the perceptions of Seychellois concerning ocean governance, fisheries management, and the blue economy. A comprehensive literature review and consultation of relevant documents were conducted to guide the initial formulation of questions that address the topic. Some important documents that were consulted by the research team include the *Seychelles Blue Economy: Strategic Policy Framework and Roadmap: Charting the future (2018-2030)* (Republic of Seychelles 2018) ('*Blue Economy Roadmap*'), the Marine Spatial Plan (SMSP, 2022), *Seychelles Coastal Management Plan 2019-2024* (World Bank & Ministry of Environment, Energy and Climate Change, 2019), various documents on the Seychelles Fishing Authority's website (www.sfa.sc) such as the *Mahé Plateau trap and line fishery co-management plan* (Seychelles Fishing Authority [SFA], 2020), the *Seychelles Fisheries Sector Policy and Strategy 2019* (SFA, 2019), and *Seychelles' Updated Nationally Determined Contributions (NDC)* (GoS, 2021). Questions and statements were compiled and internally reviewed through discussions and criticism by the team of researchers. This process led to the formulation of the first draft of the questionnaire, which captured seven sections, covering five primary topics, as follows: i) introductory questions ii) ocean management, iii) fisheries management, iv) fisheries value chain, v) aquaculture, vi) blue economy, and vii) socio-demographic profile of respondents. After the design of the first draft of the questionnaire, the next step was to organize focus group discussions (FGDs) to ensure proper contextualization of these questions.

Focus group discussion

Focus group discussions (FGDs) are frequently used as a qualitative approach to gain an in-depth understanding of social issues. The method aims to obtain data from a purposely selected group of individuals rather than from a statistically representative sample of a broader population (Nyumba et al., 2018). In this study, two FGDs were organized to ensure that the survey questions were appropriate and locally contextualized. The maximum number of participants for each FGD did not exceed ten, as Nyumba et al. (2018) recommended.

The FGDs were organized by the Blue Economy Research Institute (BERI), University of Seychelles, on Friday 20 May 2022, at the STC Conference Room. The client approved the profiles of the institutions invited to the FGDs prior to the meetings to ensure adequate representation. Two groups were invited to participate in the FGDs – local experts and the general public (see Table 1 for the profile of participants), with not all those invited being able to attend. The first group was from 8:30 to 10:30, while the second group was from 11:00 to 13:00.

The purpose of the FGDs was to i) gain additional inputs regarding essential questions that were not included in the questionnaire, ii) clarify the concepts identified during the questionnaire development,

iii) decide on definitions, and iv) understand concerns that the participants may consider to affect the quality of the survey. To achieve the aim of the FGDs, the first draft of the questionnaire was presented to each group, leading to further discussion. The concepts and different elements identified by the FGDs participants were used to develop indicators which were then turned into statements and used in the questionnaire to collect information from respondents.

Table 1: Profile of the expert and general public Focus Group participants

Local expert Focus Group	General public Focus Group
Seychelles Fishing Authority (SFA)	Fisher from association
SFA Aquaculture	Fisher – non-association &/or different sector
Department of Blue Economy Representative	Processor
SWIOFish3 Representative	Academia – The Guy Morel Institute
Seychelles Marine Spatial Plan	Tourism – Young person
Tourism Department	Private sector
NGO – Citizen Engagement Platform Seychelles	Maritime academy
Seychelles Conservation and Climate Adaptation Trust	Senior citizen
NGO – Seychelles Sustainable Tourism Foundation	

Important feedback was gathered during the FGDs that were used to revise the first draft of the questionnaire. For example, one suggestion was to move the socio-demographic questions to the end of the questionnaire. The issue of capturing respondents' education in the survey was raised as a point of concern. According to the focus group participants, the education question could be sensitive to older age groups, particularly if they perceived that their views would not be valued based on their education level. Therefore, rather than using the number of schooling years to determine education, it was proposed that education be grouped into categories that people could quickly identify.

Determining the sample size

The primary aim of this consultancy was to gain the perceptions of the people of Seychelles relating to the three areas of interest. As such, ensuring that the sample engaged with was representative of the country's population was essential. The consultants took various steps to establish a sample size representative of the population and, at the same time, achievable within the project's timeframe. Cochran (1977) lists four ways to determine a sample size representative of an entire population. They include the following: i) take a sample in two steps, and use the results of the first step to determine how many additional responses are needed to attain a representative sample; ii) use pilot study results; iii) use data from previous studies of the same or a similar population; and iv) use of mathematical formulas. The first three options are logical and produce valid estimates of variance, but Barlett et al. (2001) reiterated their technical difficulties for implementation, which also applies to the current study.

The fourth option was considered most applicable to our study due to its flexibility and the availability of population data. Seychelles' demographic data for the year 2021 was provided by the National Bureau of Statistics (NBS, 2022b) to calculate the population and consequent sample. Because survey participants were required to be 18 years and above, those below the cut-off age were removed from

the entire population. Seychellois aged 0-17 years of age were calculated to comprise approximately 25% of the country's population. Therefore, the population from which the sample size was calculated based on 2021 figures were 65169, 6605, and 2231 for Mahé, Praslin, and La Digue islands, respectively. The sample size calculation was guided by the coefficient of variation formula suggested by Nassiuma (2000) and the categorical dimension of the envisaged questionnaires.

For example, Barlett et al. (2001) recommended 2-point and 5-point scales for categorical and continuous variables. In our case, the questionnaire included both variables, with the majority being 5-point Likert-type scales, given that it's the most common approach used in perception studies. Yamane's (1967) formula was used in the calculation of the sample size as follows:

$$n = \frac{N}{1 + N\varepsilon^2}$$

Where,

n = minimum returned sample size

N = the population size (Mahé = 65169; Praslin = 6605; and La Digue = 2231)

ε = adjust margin of error $\left[\varepsilon = \frac{\rho\epsilon}{t}\right]$

e = the degree of accuracy expressed as a proportion = 0.05

p = the number of standard deviations that would include all possible values in the range (2 – 5)

t = t-value for the selected alpha level of confidence level at 95% = 1.96

Given the far larger population size for Mahé Island compared to that of Praslin and La Digue, the error term was adjusted accordingly to reduce any form of bias. Therefore, the representative samples based on the formula above for each of the islands are as follows:

For Mahé;

ε = = 0.051

n = 382

For Praslin;

ε = 0.128

n = 61

For La Digue;

ε = 0.128

n = 60

Due to the necessary error margin adjustment for Mahé Island's population, the mathematically desired sample size was calculated at 382 surveys. Past surveys conducted by a research team member

revealed high homogeneity in the Mahé population, leading to a low variation in responses (Etongo and Mashura, 2021). Low variation, in turn, means more consistent data and less need for high sample sizes. This is further supported by the fact that the multiculturalism common in most developing countries, especially in Africa, is not the case in Seychelles, built around the Creole culture (Etongo et al., 2022). Consequently, the sample size required for Mahé Island was adjusted without introducing bias, given that a stratified random sampling approach will be used in the data collection. Table 2 provides information on the sample size and the total number of targeted surveys, including the actual number achieved.

Table 2: Population size, calculated sample size and targeted survey numbers for the three main islands, as well as the actual number of surveys achieved, including totals

Island	Estimated population 18 years and older*	Calculated sample size	Adjusted sample size	Survey target number	Actual number sampled
Mahé	65,169	382	200	240	**413**
Praslin	6,605	61	61	75	**139**
La Digue	2,231	60	60	75	**118**
Not specified	-	-	-	-	**4**
Total	*74,005*	*503*	*321*	*390*	***674***

**Source: NBS (2022b): 2021 Mid 2021 Population Estimates.*

Training of enumerators and piloting of survey

The team of researchers reached out to potential enumerators within their network. A total of 11 current and past students of the University of Seychelles' (UniSey) Environmental Science program indicated an interest in participating in the research. The consulting team designed a training manual and workshop for the prospective enumerators, which took place on Friday, 1 July 2022, at UniSey's Anse Royale Campus. Once this was completed, the final group of enumerators was reduced to 10 individuals: nine current or graduating students and one alumnus. A photograph of the team that participated on the Praslin field trip can be found in Figure 1, providing an illustration of the survey team, or *Tim Sondaz*.

Each participant was provided a hard copy of the questionnaire during the workshop to familiarize themselves with the questions. Four research team members facilitated the workshop at the Blue Economy Research Institute (BERI) of UniSey. The survey context was introduced to the participants, followed by interview procedures and best practices. Since the team of researchers had already agreed to use KoboCollect – an open-source Android app for collecting survey data – training on its usage was provided to the workshop participants. This included a practical demonstration session in which the participants were provided with the username and password to log in to the survey. As part of the training, participants worked in pairs, with one in each group acting as a respondent for the questionnaire to be completed in KoboCollect. The training ended with a session on how to manage conflicts during survey implementation. Each participant was provided with a hard and soft copy of the 'Survey Training Manual' designed for this project.

Piloting the questionnaire allowed the team of researchers to evaluate how respondents interpret the meaning of the questions and whether all respondents interpret the questions in the same manner. It

also investigated whether the range of response options was sufficient and ensured that the questions elicit helpful information for the survey. More importantly, it allowed reflection on the successes and failures of the administration process.

The draft survey was piloted in Mont Plaisir and Anse Royale on 12 July 2022 in order to identify practical problems. The enumerators completed a total of ten surveys, and sound feedback was received during this session. Some of the comments included the length of the survey, which was considered too long, with a completion time ranging from 50 minutes to one and a half hours. The introduction of the research at the start of the questionnaire was considered lengthy and needed to be summarized. Respondents were kind enough to provide additional feedback to the enumerators. Eight out of the ten respondents preferred the survey to be conducted at home, whilst all were of the opinion that there were no offensive questions in the survey.

Data collection and analysis

The total number of surveys required by the sample size calculations gave the survey team a target of 321 surveys in total across the three islands. It is common knowledge by experienced survey administrators that their surveys have the risk of being incorrect, incomplete or completed in a biased manner during the data collection process. Consequently, the consultants increased the targeted number of surveys by 20% to give the enumerators a revised target of 390 surveys (Table 2).

Survey administration tends to improve during the course of a survey period due to the enumerators improving upon their technique and becoming more familiar with the delivery. The consultants initially estimated that the enumerators would conduct on average five surveys per day. However, as the enumerators refined their approach, they became more efficient. It became common for enumerators to be completing eight to ten surveys in a day. Consequently, the initial targets set for the survey were well exceeded. By the end of the survey period 734 surveys had been collected. A total of 60 responses were from those not willing to participate in the survey, or surveys that were not usable, resulting in a usable sample of 674 from across the three islands. This gave an impressive response rate of 92%. A stratified random sampling method was applied during the data collection to ensure proper representation in terms of age, gender (Table 3), and island. The result of the actual distribution of age and sex captured in the survey in comparison with the national population proportions can be found in Table 3 in the following section.

Well trained enumerators were tasked with conducting the in-person data collection and entry. They were supported by the consulting team who were responsible for day-to-day management of the enumerators and their logistics, providing feedback and critical information, as well as assessing the success of the data collection, revisiting this at regular intervals.

Due to the relatively large number of surveys required, and the distribution of the sample across the three islands, the enumerators required significant support in order to achieve the desired results within limited time. Enumerators primarily conducted the survey over weekends according to feedback from the FGDs and to increase the likelihood of respondents being available.

Figure 1: Enumerators and their supervisor prior to data collection on Praslin

Since the data were collected using the Kobo Toolbox, an excel file containing all the collected data was downloaded from the account that was created for this project. The survey was conducted in both English and Creole, resulting in two separate excel files that had to be combined to consolidate the entire sample into one file. The next step was data cleaning, where the non-responses and poorly completed surveys were deleted, corresponding to the 60 of the 734 surveys that were removed from the sample across the three main islands. Quantitative methods were applied in the data analysis. The purpose of quantitative analysis is to attain greater knowledge and understanding of situations or events that affect people – in this case, their perceptions on Blue Economy-related topics in Seychelles. Using Excel Version 2019, the data was analysed in the form of frequencies and percentages across the five topics, namely ocean governance, fisheries management, fisheries value chain, aquaculture, and the blue economy.

Aside from the use of Excel Version 2019, the Statistical Package for Social Sciences (SPSS) Version 20 was used for the Multinomial Logistic Regression (MLR). The MLR model is one of the important methods for categorical data analysis. This model deals with one nominal/ordinal response variable that has more than two categories. In this study, five level Likert-Scale type questions were used to assess respondents' satisfaction with, for example, ocean governance. These five levels included the following: i) very dissatisfied, ii) dissatisfied, iii) neither dissatisfied, nor satisfied, which is also considered as being "neutral", iv) satisfied, and v) very satisfied. Given that the dependent variable is not dichotomous, the binary regression model cannot be applied, rather, the MLR which is suited for this type of data was considered. Explanatory variables that are believed to influence the level of satisfaction on ocean governance and fisheries management were selected. These variables included

the different islands, also known as the location of the respondents, gender, level of education, and age of the respondents. Common significance levels of 0.10 (1 chance in 10), 0.05 (1 chance in 20), and 0.01 (1 chance in 100) were considered in the MLR.

Results and Discussion

The following chapter presents the findings of the survey on Seychellois perception of ocean governance, fisheries management and blue economy. The themes mentioned were further divided into the five topics presented in this section, namely ocean management, fisheries management, fisheries value chains, aquaculture and blue economy. Each topic was presented in the order that it appeared in the survey. The results focus initially on the respondents' self-reported knowledge of the topic in question, whereafter the responses to the eight general Likert scale questions are discussed. Each topic is concluded with a reflection on the respondents' satisfaction with the management of that particular topic, with the exception of the BE. The full questionnaire can be found in Appendix 1: English version of survey. In some instances, management of more than one aspect of the topic was surveyed. For instance, Seychelles has nine recognised fisheries, all of which were presented to respondents to elicit their satisfaction with the management of these. Here, only the aggregated satisfaction and the four primary fisheries related to the SWIOFish3 program are presented in the main text, with the remainder available in Appendix 3: Supplementary graphs.

Analysis of the different responses associated with the knowledge and satisfaction of the different topics was conducted at an aggregated level, and disaggregated by sex, island and age. The disaggregated graphs are found in the relevant sections, also in Appendix 3: Supplementary graphs.

Initially, a brief account of how representative the sample is, is presented, after which the survey topics are discussed. Information relating to the communication, education and awareness details captured in the survey are found in the following chapter.

Sample representation

The survey was conducted at random. Enumerators were taken to varying locations on each of the islands and expected to randomly approach households, before being taken to the next location. Each of Seychelles' 26 districts across the three main islands were sampled in this process. During the sampling, enumerators attempted to approach males and females at an equal frequency due to the make-up of Seychelles population being 50.7% male and 49.3% female (NBS, 2022b). During the process more females were sampled than males, resulting in the sample's proportion being 49.2% male and 50.8% female, showing an over sampling of females by 1.5% when compared with the population structure. The details of the composition of the sample and the corresponding population proportions are found in Table 3.

The enumerators found it challenging to engage with older demographics, particularly those 65 years and older. This was in spite of the consultants organising for a pair of enumerators to visit an old age home. As a result, those 65 and older were under represented by 7.6% when compared with the population. Women aged 55-64 were the most under surveyed demographic with there being a 9.7% difference between the sample and its corresponding population proportion. This could be explained by women being more active in the community and less likely to be present at their homes on weekends, when most surveys were conducted. The youth was over targeted with those aged 18-24 being over represented by 4%, and 25 to 30 year olds by 6.8%. Two possible explanations for this include the disproportionately high 'Youth not in employment, education or training (NEET)' rate in Seychelles (24.9% - NBS 2021c) indicating a higher likelihood of them being home as opposed to at work. The second possible reason is the possibility of enumerator bias, as all the enumerators were in

the age bracket of 19-23 years old. There is the possibility that they would prefer to engage with those of a similar age.

Table 3: Summary of the survey sample size by age and gender, including a comparison with the corresponding population (pop'n) proportion and the consequent over- or under-sampling, as represented by the column 'Error'

Age	Male sample	% of Male	Pop'n %	Error	Female sample	% of Female	Pop'n %	Error	Total sample	% of Total	Pop'n %	Error
18-24	38	11.6	7.5	4.0	38	11.2	7.3	3.9	76	11.4	7.4	4.0
25-30	52	15.8	8.6	7.2	44	12.9	6.5	6.5	96	14.3	7.6	6.8
31-44	104	31.6	31.0	0.7	100	29.4	26.9	2.5	204	30.5	29	1.5
45-54	52	15.8	20.3	-4.5	87	25.6	20.3	5.3	139	20.8	20.3	0.5
55-64	58	17.6	18.3	-0.6	40	11.8	21.4	-9.7	98	14.6	19.8	-5.2
65+	25	7.6	14.3	-6.7	31	9.1	17.6	-8.5	56	8.4	16	-7.6
Total	329	100	100	0.0	340	100	100	0.0	669	100	100	0.0
% Grand total	49.2%		50.7%	-1.5%	50.8%		49.3%	1.5%		100%		

Ocean governance/management

Ocean management knowledge

Of all the 659 respondents who answered the question about their knowledge of ocean management, 49% reported neither low nor high knowledge. While 16% of the respondents demonstrated high knowledge, a minuscule 6% had very high knowledge (see Figure 2). On the other hand, those in the low and very low knowledge categories on ocean management represented 21% and 8%, respectively. The relatively higher proportion of respondents in neither the low nor high category did not allow for a significant distinction between those with either lower or higher knowledge. This pattern is repeated even in the other graphs that show the knowledge of ocean management in terms of sex, island, and age, which showed slight differences from one category to another (see Appendix 3: Supplementary graphs). One plausible reason could be that the majority of the respondents may have chosen a neither low nor high level of knowledge on ocean management as a convenient response that seems appealing to them.

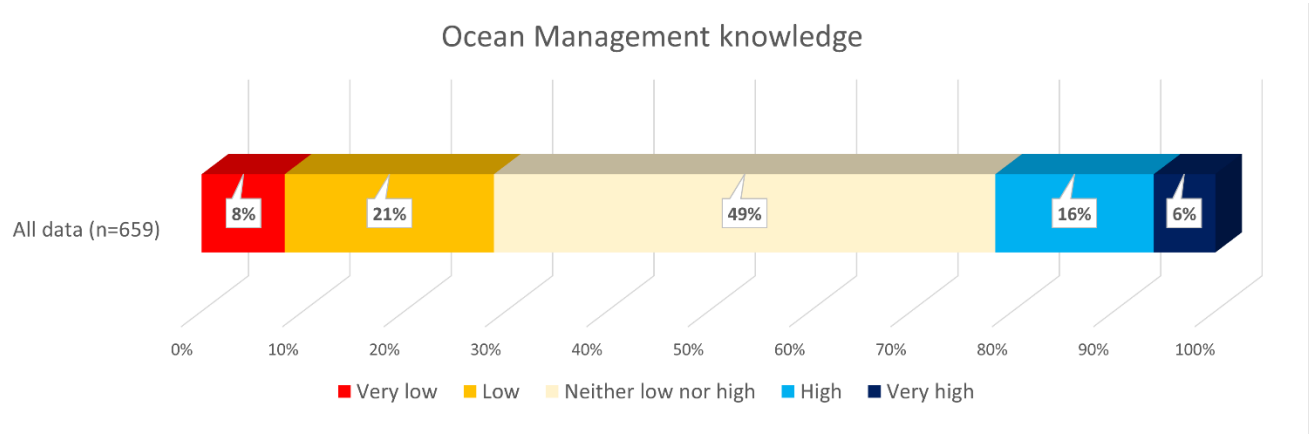

Figure 2: Graph showing the overall knowledge on ocean management

Ocean management Likert questions

Figure 3 is a graph based on eight Likert scale questions used to assess respondents' level of agreement or disagreement regarding ocean management. Chief among these questions that received the highest level of disagreement included 38% of the respondents who disagreed with the statement on knowing where to find information on ocean protection (Figure 3). This was followed by 37% of respondents who also disagreed with the statement that adequate law enforcement exists in Seychelles waters. More importantly, 30% strongly disagreed and 28% disagreed with the statement that oil and gas exploration in Seychelles should be allowed (Figure 3).

On the other hand, 63% of the respondents agreed that the Marine Spatial Plan (MSP) is a good way of managing the ocean. Such a high level of agreement shows that the Seychellois population is aware of the MSP as an essential tool for ocean governance. Ocean health and productivity appears to be of paramount importance to Seychellois with 59% of respondents strongly agreeing with this. Another 56% of respondents agreed that their opinion matters for decision-making on the management of coastal and ocean space (Figure 3). Such findings are significant as community members know they have a role to play in the co-management of coastal and ocean resources.

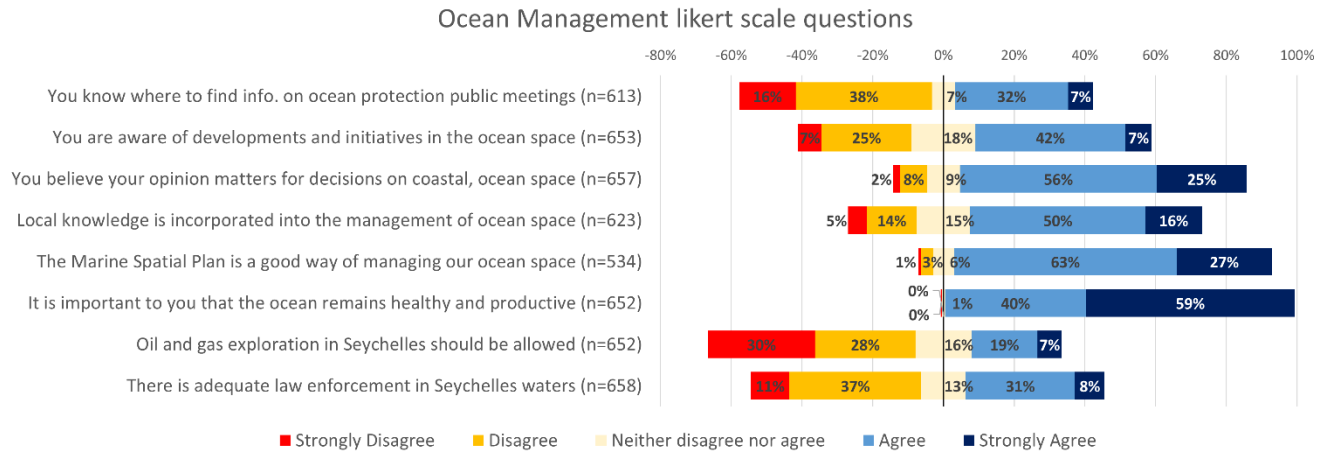

Figure 3: Graph showing levels of agreement or disagreement of ocean management based on eight questions that were asked to respondents

Ocean management satisfaction

Regarding the level of satisfaction with the management of Seychelles' MPAs, an overwhelming majority mentioned that they are satisfied with the current management. This figure corresponded to 73% of the 533 respondents that answered this question (Figure 4). In addition, another 4% of the respondents were very satisfied with the management of Seychelles' MPAs (Figure 4). The level of satisfaction outweighed the level of dissatisfaction, which was conspicuous even between sex, islands, and age groups (see Appendix 3: Supplementary graphs). In fact, there weren't any observed differences between males and females regarding their level of satisfaction with the management of Seychelles' MPAs. Such a result is a pointer to the fact that MPAs in Seychelles have been well managed over the years and Seychellois are aware of the successes that have been recorded. This can be seen as a boon for managers of Seychelles' older, established MPAs.

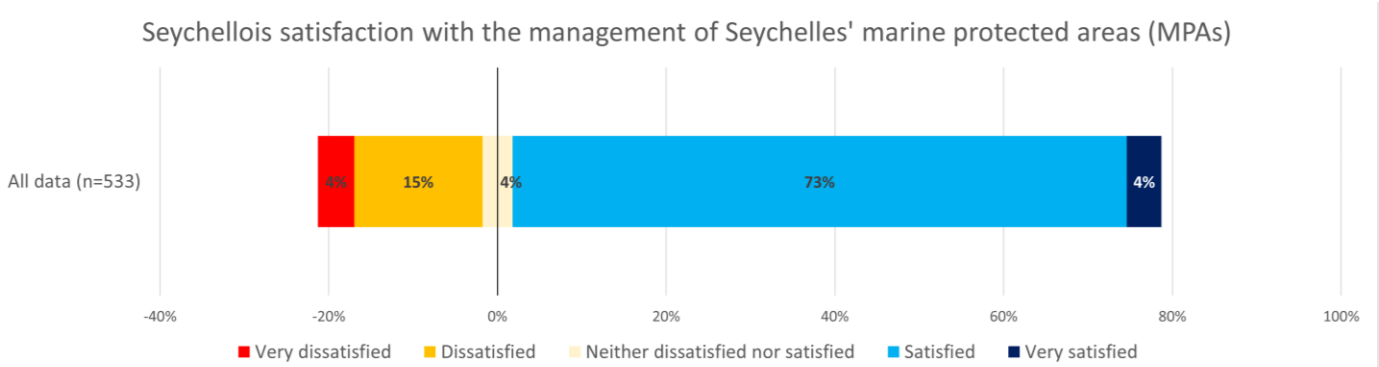

Figure 4: Graph showing the different levels of satisfaction with the management of Seychelles' Marine Protected Areas (MPAs)

On March 26th, 2020, the world witnessed a historical event where Seychelles completed a six-year-long initiative, designating 30% of its EEZ as MPAs, a target reached ten years ahead of the global target to have 30% ocean protection by 2030. The SMSP resulted in the declaration of 13 new MPAs in high biodiversity and medium biodiversity zones. Designation does not imply implementation, which is the case here as the SMSP MPAs are to be implemented in 2023. Consequently, the survey results are linked to the pre-SMSP designated MPAs. This result is useful as it provides a baseline against which the SMSP MPAs can be measured as implementation progresses.

Like the MPAs, a similar pattern was also observed regarding satisfaction with managing Seychelles' ocean and marine resources (see Figure 5). An interesting pattern that can be observed with the results is that the level of satisfaction towards the management of Seychelles' ocean and marine resources increases with age (see Appendix 3: Supplementary graphs). This was the case with the 45-54, 55-64, and 65 years and above age groups. One possible explanation for such a pattern could be linked to the fact that the older age groups have a much better appreciation by virtue of the age of the changes in terms of management that have taken place regarding Seychelles' ocean and marine resources.

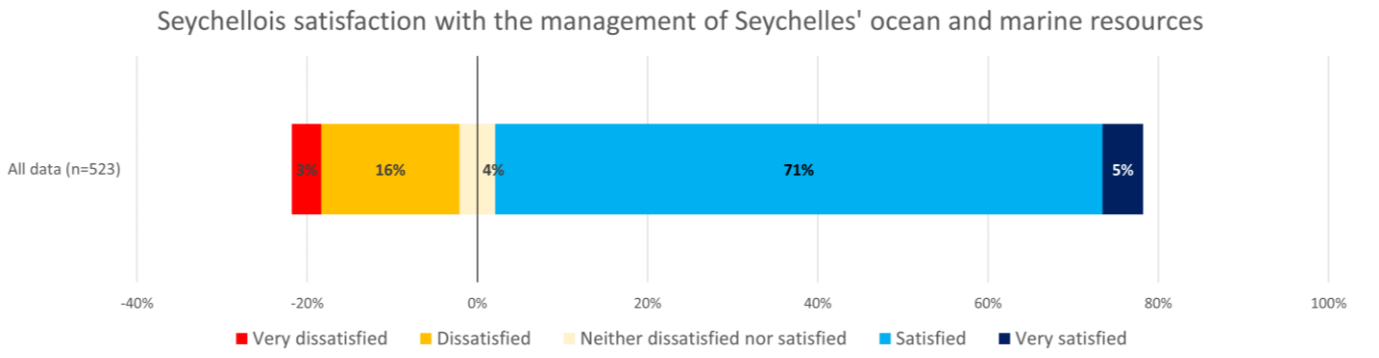

Figure 5: Graph showing different levels of satisfaction with the management of Seychelles' ocean and marine resources

Given that different factors are likely to influence the levels of satisfaction, a multinomial logistic regression (MLR) was performed to predict the independent variables that influences the level of

satisfaction towards the management of Marine Protected Areas (MPAs). The results of the MLR are presented below.

The "model fitting information" table contains a Likelihood Ratio chi-square test comparing the whole model. Statistical significance indicates that the entire model significantly improves fit over the null model. In our analysis, the final model is a significant improvement in fit over a null model [χ^2 (16) = 33.597, p<.005] (see Table 4a).

Table 4a: Model fitting information

Table 4a - Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	741.949			
Final	708.352	33.597	16	.006
Cox and Snell = .049; Nagelkerke = .054; McFadden = 0.21				

The likelihood ratio tests contain the results of the overall contribution of each independent variable to the model. Using the conventional 0.05% threshold, the age and education of the respondents were the two significant predictors in the model (see Table 4b).

Table 4b – Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	718.635	10.283	4	.036
Island	712.382	4.030	4	.402
Age	727.687	19.335	4	.001
Gender	709.672	1.320	4	.858
Education	720.744	12.392	4	.015

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

The parameter estimates of the model provide information comparing each level of satisfaction about Seychellois towards the management of MPAs in Seychelles. The analysis uses "very satisfied" as the reference category. Specifically, the regression coefficients indicate which predictors significantly

discriminate across the five satisfaction levels based on four independent variables – age, gender, education, and island. Mahé, Praslin, and La Digue were the three case study islands that were used in the current study. The first set of coefficients represents comparisons between 'very satisfied' and 'very dissatisfied'. Our model results showed that age and education are significant predictors at the 10% and 5% significance levels, respectively. The odds ratio of .674 for the age indicates that for every unit increase in age, the odds of being 'very dissatisfied' changed by a factor of .674. In other words, the odds were decreasing concerning the satisfaction levels towards the management of Seychelles' MPAs. Regarding the education of respondents, for every unit increase in the level of education, the odds of being 'very dissatisfied' change by a factor of .603. Therefore, age and education were found as significant predictors of the management of Seychelles Marine Protected Areas (MPAs).

Fisheries management

Fisheries management knowledge

The second topic considered in this study to assess the perceptions of Seychellois was fisheries management. Fisheries management is the process that creates and enforces the rules and regulations that are needed to prevent overfishing and help overfished stocks rebound (Smith and Sissenwine, 2001). Successful fishery management allows for sustainability of fish stocks, food for consumers, and livelihood for those in the industry, which is of great importance in Seychelles, given the sector's contribution to the nation's Gross Domestic Product (GDP). Knowledge of fisheries management of 646 respondents was assessed. The overall results showed that 51% of the respondents rated their knowledge of fisheries management as 'neither low nor high', followed by another 25% with 'low knowledge' and 12% for those with 'high knowledge' (Figure 6). A further assessment of fisheries knowledge in terms of sex, island, and age also indicated that most respondents rated their knowledge as neither low nor high (see Appendix 3: Supplementary graphs).

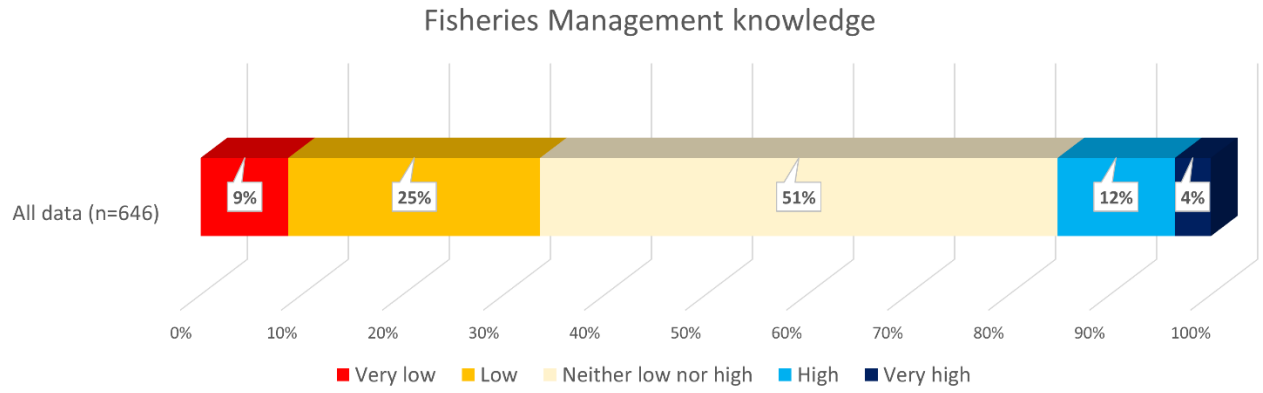

Figure 6: Graph showing knowledge on fisheries management

Table 4c - Parameter Estimates

Level of satisfaction on the management of MPAs[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1 Very dissatisfied	Intercept	2.900	1.733	2.799	1	.094			
	Island	-.050	.402	.015	1	.901	.951	.432	2.092
	Age	-.395	.214	3.412	1	.065	.674	.443	1.024
	Gender	.147	.585	.063	1	.801	1.159	.368	3.648
	Education	-.506	.249	4.142	1	.042	.603	.370	.981
2 Dissatisfied	Intercept	2.901	1.326	4.783	1	.029			
	Island	.181	.299	.368	1	.544	1.199	.668	2.152
	Age	-.302	.163	3.434	1	.064	.739	.537	1.018
	Gender	.091	.441	.043	1	.836	1.096	.462	2.599
	Education	-.289	.176	2.704	1	.100	.749	.531	1.057
3 Neutral	Intercept	3.855	1.254	9.447	1	.002			
	Island	-.022	.286	.006	1	.938	.978	.558	1.714
	Age	-.195	.153	1.632	1	.201	.823	.610	1.110
	Gender	.324	.414	.611	1	.435	1.382	.614	3.114
	Education	-.456	.163	7.777	1	.005	.634	.460	.873
4 Satisfied	Intercept	3.106	1.198	6.722	1	.010			
	Island	.204	.272	.560	1	.454	1.226	.719	2.092
	Age	-.006	.146	.001	1	.970	.994	.746	1.325
	Gender	.145	.395	.134	1	.714	1.156	.533	2.509
	Education	-.242	.153	2.481	1	.115	.785	.581	1.061

a. The reference category is: 5 Very satisfied.

However, females expressed lower knowledge than their male counterparts, with figures from both groups in the low and very low categories corresponding to 38% and 28%, respectively (see Appendix 3: Supplementary graphs). Such a result is not surprising given that culturally, fishers are mostly men given the challenges associated with the profession, such as long days at sea, physically demanding work, and the risks involved, such as the roughness of the sea during poor weather conditions (Etongo and Mashura, 2021). Women, on the other hand, are primarily engaged in fish processing and sales of fish. Since men dominate the profession, they are likely to be more knowledgeable regarding the rules and regulations in the fishery sector, such as bag limits, catch sizes and no-take zones as demonstrated by a recent study in Seychelles (Etongo and Mashura, 2021).

Fisheries management Likert questions

Using eight questions linked to fisheries management, a Likert scale response based on the level of agreement and disagreement was applied to assess the respondents' knowledge of fisheries management. In general, the agreement level outweighed the disagreement level (Figure 7). A total of 62% of the respondents agreed to the question that Seychelles benefits from international fisheries development funding, followed by another 20% who strongly agreed to this question. The socio-economic development of Seychelles and its fisheries sector is at the core of the activities supported by the European Union (EU) under the sectoral support program of the Sustainable Fisheries Partnership Agreement (SFPA). Each year for the entire protocol (2020 – 2026), a financial contribution of €2,800,000 by the EU is specifically earmarked to promote the sustainable management of fisheries in Seychelles and support the development of small-scale fisheries (Seychelles Nation, 2021). It's therefore evident that most of the Seychellois populace is aware of the financial support provided to Seychelles for developing the fisheries sector, especially from the EU.

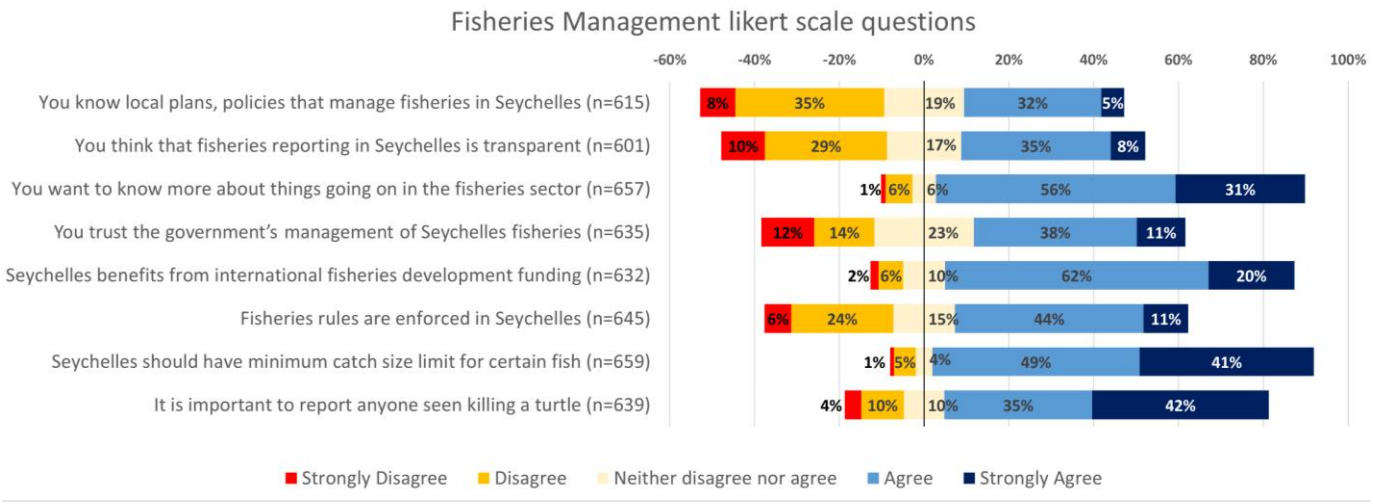

Figure 7: Respondents knowledge on fisheries management based on Likert scale question

Furthermore, 56% of those who agreed, in addition to another 31% who strongly agreed, wanted to know more about what is going on in the fisheries sector (Figure 7). Seychelles conducted the

assessment against the complete set of the 12 transparency requirements of the Fisheries Transparency Initiative (FiTI) Standard instead of only the minimum first six requirements. This ambitious exercise is a clear testament to the importance of transparent marine fisheries to Seychelles. This report which was produced by multi-stakeholder groups with representatives from the government, businesses (mostly fishers), and civil society, was published in 2019. In fact, the report is very comprehensive and contains considerable information that community members often ask for. Therefore, communicating this information to the public has been lacking, which aligns with our findings as most of the community wants to know more about activities going on in the fisheries sector.

Another 35% and 42% did agree and strongly agreed that it's essential to report anyone seen killing a turtle (Figure 7). Sea turtles are protected in Seychelles under the 'Wild Animals and Birds Protection Act, of which the Wild Animals (Turtles) Regulations enacted in 1994 completely bans all disturbances, harvest, sale, possession of turtles, turtle products, or eggs. Therefore, community members are aware of its protection status as the sensitization campaign has been ongoing even in primary schools for many years. On the other hand, 35% of the respondents disagreed that they know about local plans and policies that manage fisheries in Seychelles. While most of these policies are available online, most community members might prefer a different communication channel. Regarding fisheries reporting in Seychelles being transparent, 29% of the respondents and another 10% disagreed and strongly disagreed with this statement (Figure 7). Some community members were of the opinion that annual figures for actual and allowable catches should be available to the public to enhance transparency.

Fisheries management satisfaction

The level of satisfaction in terms of fisheries management in Seychelles was captured in this study based on the perceptions of Seychellois. Of all the respondents that answered this question, the level of satisfaction was far greater than those who were dissatisfied; 72% were satisfied, followed by 14% dissatisfied with fisheries management in the country (Figure 8). Interestingly, there weren't any marked differences regarding Seychellois satisfaction with the management of fisheries by sex, island, and age groups (see Appendix 3: Supplementary graphs). Across these categories, those who mentioned that they were satisfied were the majority.

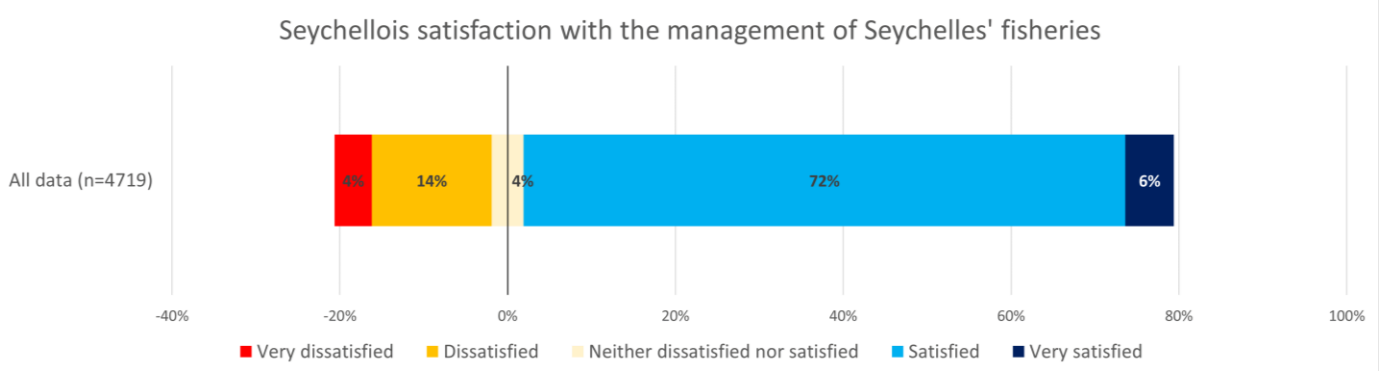

Figure 8: Graph showing Seychellois level of satisfactions with the management of Seychelles' fisheries

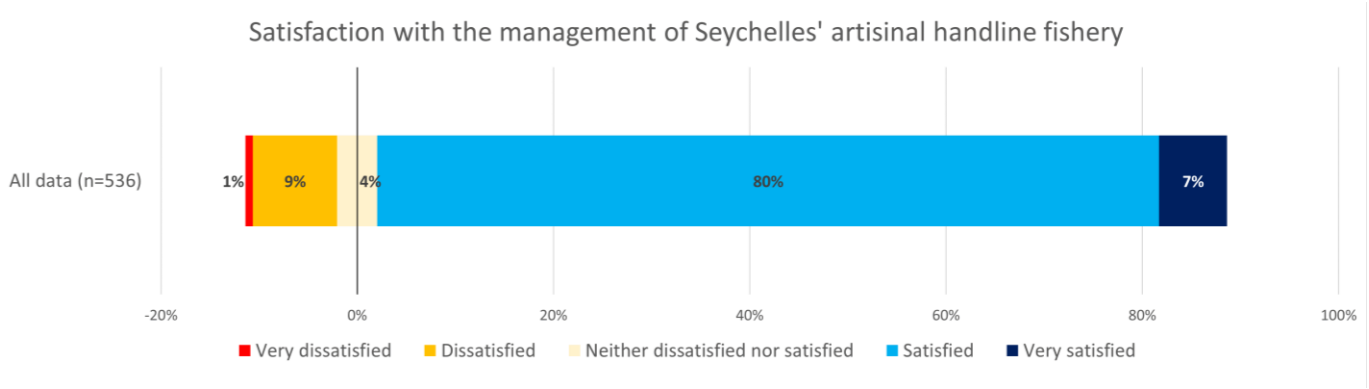

Figure 9: Graph showing Seychellois level of satisfactions with the management of Seychelles' artisanal handline fishery

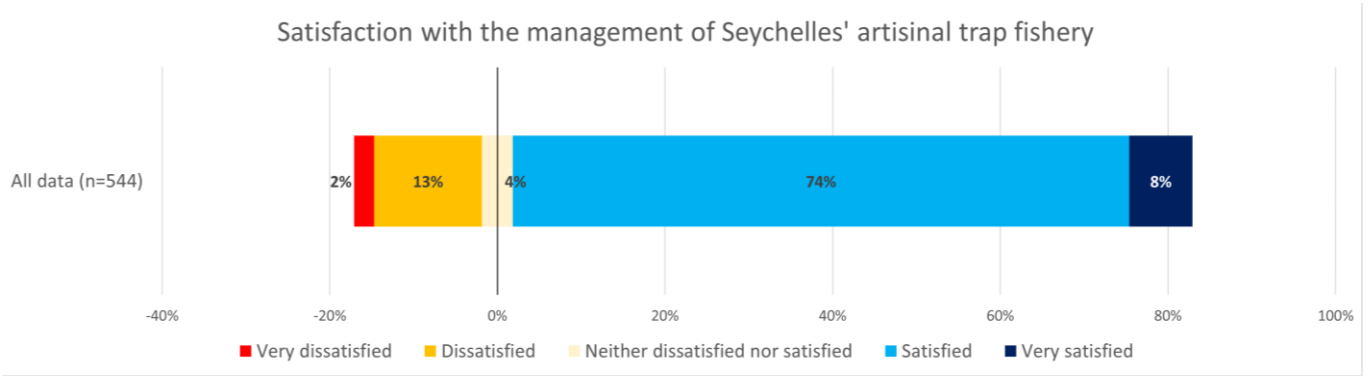

Figure 10: Graph showing Seychellois level of satisfactions with the management of Seychelles' artisanal trap fishery

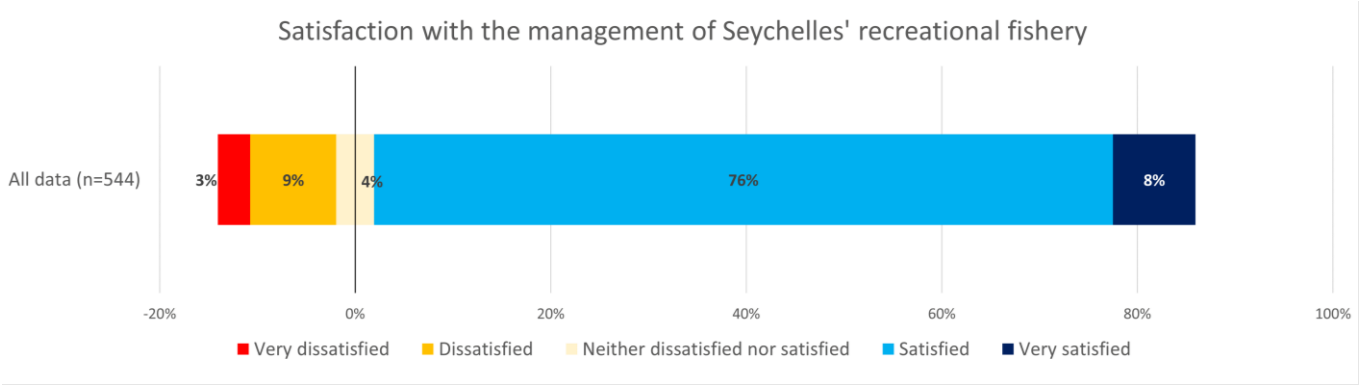

Figure 11: Graph showing Seychellois level of satisfactions with the management of Seychelles' recreational fishery

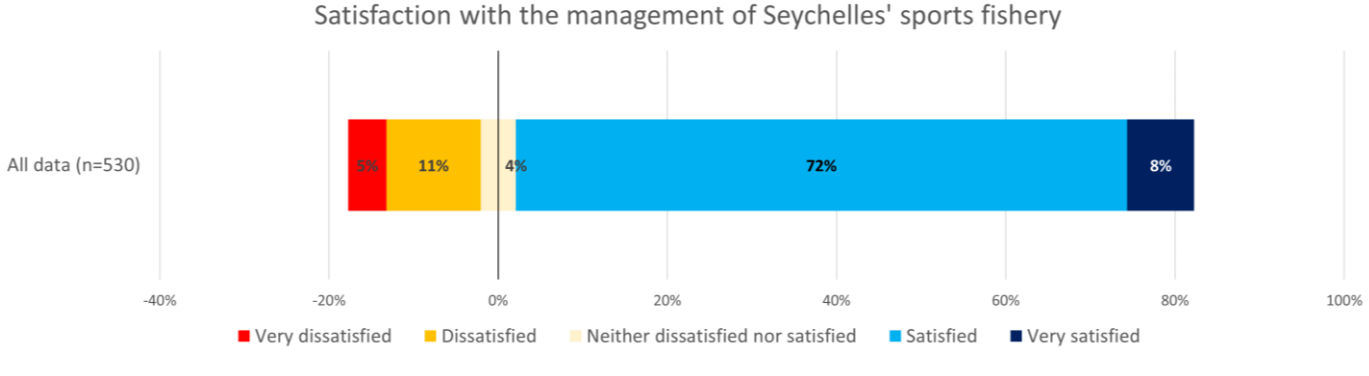

Figure 12: Graph showing Seychellois level of satisfactions with the management of Seychelles' sports fishery

Fisheries value chains

Fisheries value chain knowledge

The value chain approach helps enhance the sectors' competitiveness, identify and understand the significant opportunities for upgrading (Government of Seychelles, 2019) and the driving constraints to market growth, and generate recommendations for priority actions that can result in increased benefits for sole fishery sector participants. Based on the survey results, 46% of the survey respondents had neither low nor high knowledge of the fisheries' value chains (Figure 13). This was followed by 24% and another 19% with low and very low knowledge, respectively (Figure 13). Males demonstrated slightly better knowledge than females (see Appendix 3: Supplementary graphs). This could be linked to the fact that most fishers are male, and they understand the different actors and processes in the fishery sector.

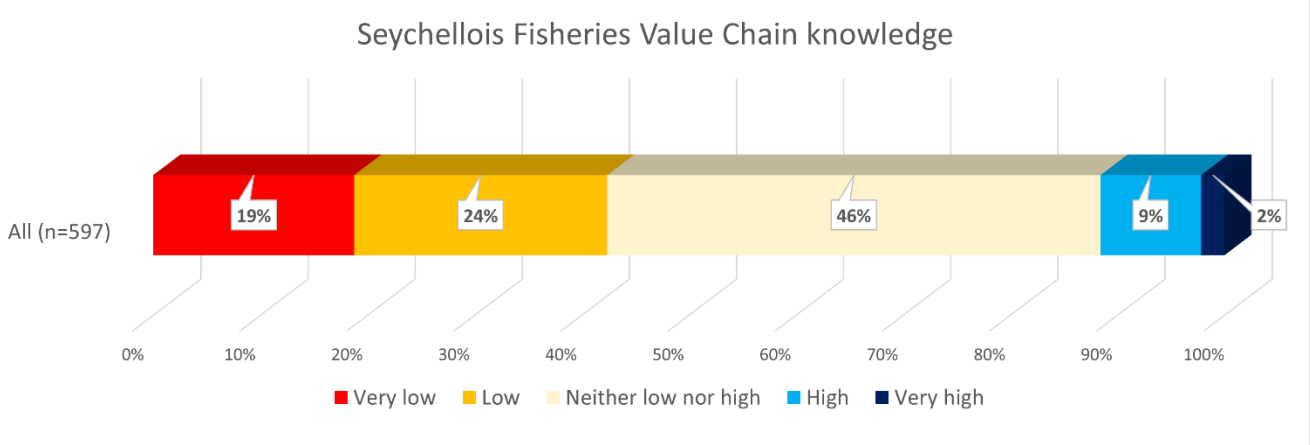

Figure 13: Graph showing respondents knowledge of Seychelles fisheries value chain

Regarding age, those 65 years and above demonstrated lesser knowledge of the fisheries value chain than the other age groups (see Appendix 3: Supplementary graphs). La Digue is the smallest of all the islands in terms of size and fisheries-related infrastructures. That could be one possible explanation for the 30% of respondents who mentioned very low knowledge of the fisheries value chain (see Appendix 3: Supplementary graphs).

Fisheries value chain Likert questions

A total of eight questions with Likert scale responses were asked to further assess Seychellois knowledge of the fisheries value chain. 69% of the respondents agreed, and another 21% strongly agreed that international trade is essential to the Seychelles fishery value chain. Regarding the statement that there are job opportunities in the fisheries value chain in Seychelles, 69% and 14% agreed and strongly agreed with this statement (Figure 14). Sixty-five percent and 20% of the survey respondents agreed and strongly agreed with the statement that there are business opportunities in the fisheries value chain in Seychelles. This is true given that other fishery-related income-generating activities were mentioned during the survey aside from being a fisherman. Some of these activities include selling fish by the roadside and in the market, processing plants, restaurants, transportation of fish, etc.

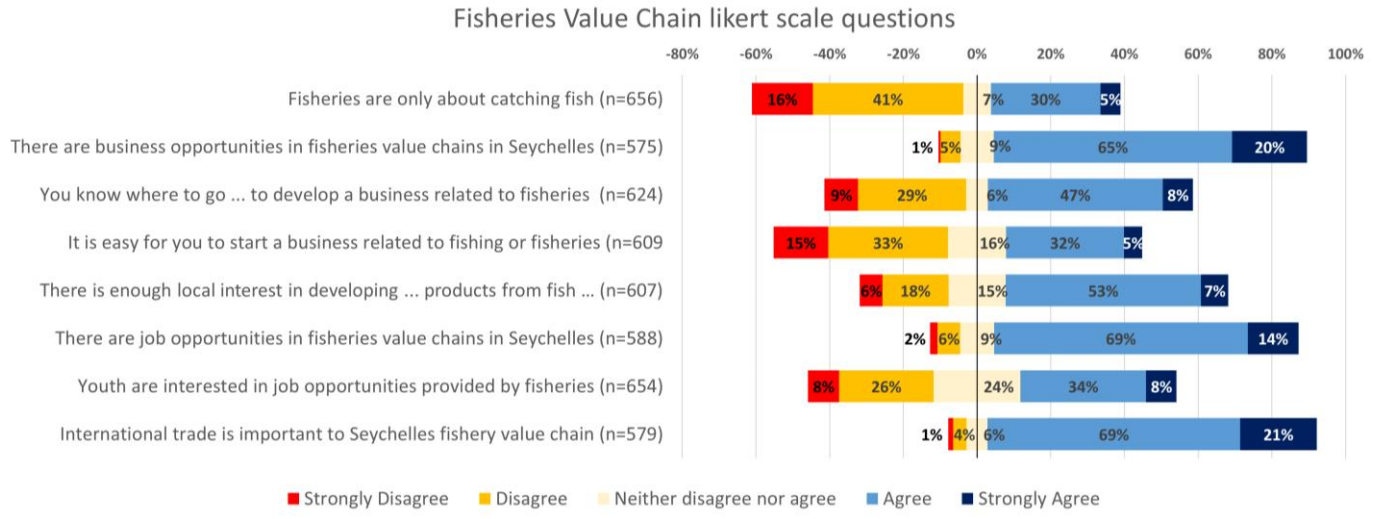

Figure 14: Likert scale question to assess Seychellois knowledge on fisheries value chain

Though respondents recognized that there are business opportunities in the fisheries value chain in Seychelles, 33% disagreed with the statement that it's easy to start a business related to fishing or fisheries. 41% of the respondents disagreed that fisheries are only about catching fish (Figure 14). Such a position demonstrates their knowledge regarding value addition and other fishery-related activities, which goes beyond those involved in the actual catch.

Fisheries value chain satisfaction

Despite some disagreements that respondents registered, an overwhelming 73% of the respondents were satisfied with the management of Seychelles' fishery value chain (Figure 15). Those who were satisfied were the majority regarding sex, island, and age groups (see Appendix 3: Supplementary graphs). Differences between sex, island, and age groups were minimal. Therefore, the level of satisfaction outweighed the level of dissatisfaction. What was interesting in this case is that neither dissatisfied nor satisfied Likert scale answers received very low responses. Individuals were, therefore, able to identify whether they were satisfied or dissatisfied with the management of Seychelles' fishery value chains.

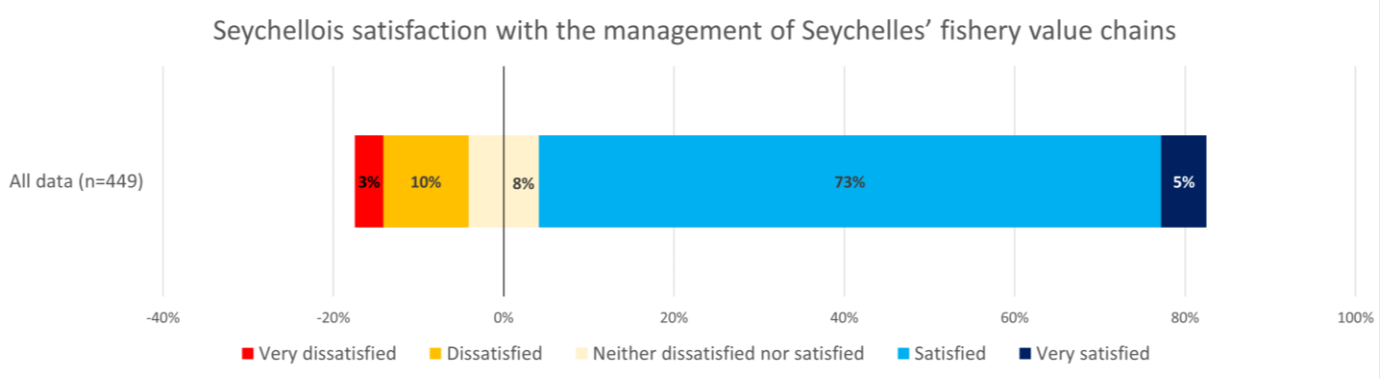

Figure 15: Graph showing Seychellois level of satisfaction with the management of Seychelles' fishery value chains

Aquaculture

Aquaculture knowledge

Another essential theme considered in this study was that of aquaculture. Aquaculture, or fish farming, is needed to help meet the ever-growing demand for seafood and provide people in developing countries with healthy protein while reducing the pressure on wild fish (McClanahan et al., 2013; Pradeepkiran, 2019). Aquaculture is the fastest-growing food-supply industry in the world, with an annual average growth rate of 8.6 percent during the last three decades (FAO, 2014; Troell et al., 2014). As Seychelles looks for ways to grow its economy further, the government steers towards the idea of Aquaculture (Mariculture). Two studies were conducted to determine the desirability of developing marine aquaculture in Seychelles. They revealed positive support for creating an environmentally and socially responsible mariculture sector leading to the development of a Mariculture Master Plan (MMP), which started in 2011.

The knowledge of Seychellois was assessed based on self-reporting on the topic of aquaculture. Of the 620 respondents that answered this question, 37% indicated neither low nor high knowledge (Figure 16). Interestingly, 26% each reported low and very low knowledge of aquaculture. Combining both figures shows that 52% of the entire pool of respondents is not familiar with the topic of aquaculture (Figure 16). On the other hand, just 9% and a minuscule 2% reported high and very high knowledge of aquaculture. Such a result indicates that education and awareness need to be improved especially for community buy-in to support the local market. Anecdotally, of the 105 respondents that included comments, 17% mentioned the need for this, reinforcing this position and suggesting that aquaculture in Seychelles is export-oriented. While such an opinion might be a misconception, education and awareness from the concerned government ministries and departments have not been effective.

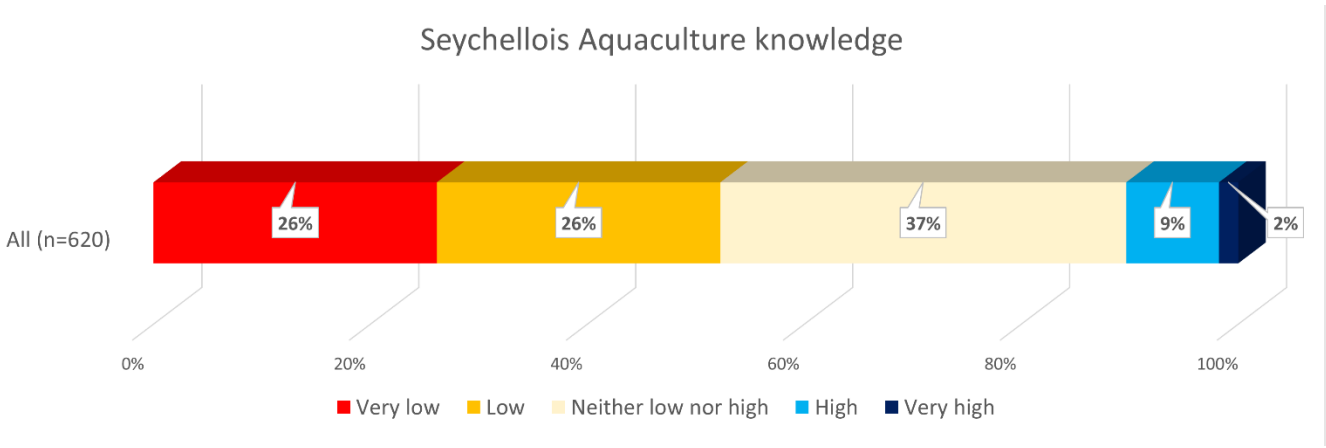

Figure 16: Graph showing Seychellois' knowledge on aquaculture

A further assessment of Seychellois' knowledge of aquaculture based on sex, island, and age groups demonstrated a similar pattern (see Appendix 3: Supplementary graphs). For example, most respondents had neither a low nor high level of knowledge, followed by low and very low knowledge. Those 65 years and above had the least knowledge of aquaculture for the age group. This could be

attributed to the fact that the elderly age group is accustomed to the traditional approaches to fisheries management, and recent interventions such as aquaculture are available in languages, terminologies, and mediums used mainly by the younger population.

Aquaculture Likert questions

Eight Likert scale questions were further used to assess the knowledge of Seychellois on aquaculture. Chief among these questions that 64% of respondents strongly agreed to was the statement that there needs to be more education and awareness about aquaculture in Seychelles (Figure 17). Aside from the 64%, another 34% of the respondents agreed with the prior statement. This was followed by 52% of the respondents and another 20% who agreed and strongly agreed that there are enough opportunities in aquaculture for women in Seychelles. Despite being a Large Ocean State (LOS), with an estimated Exclusive Economic Zone (EEZ) of 1.35 million km^2, 52% of the respondents agreed that aquaculture is needed in Seychelles. This is followed by another 51% who agreed that aquaculture in Seychelles would put less pressure on fish stock (Figure 17).

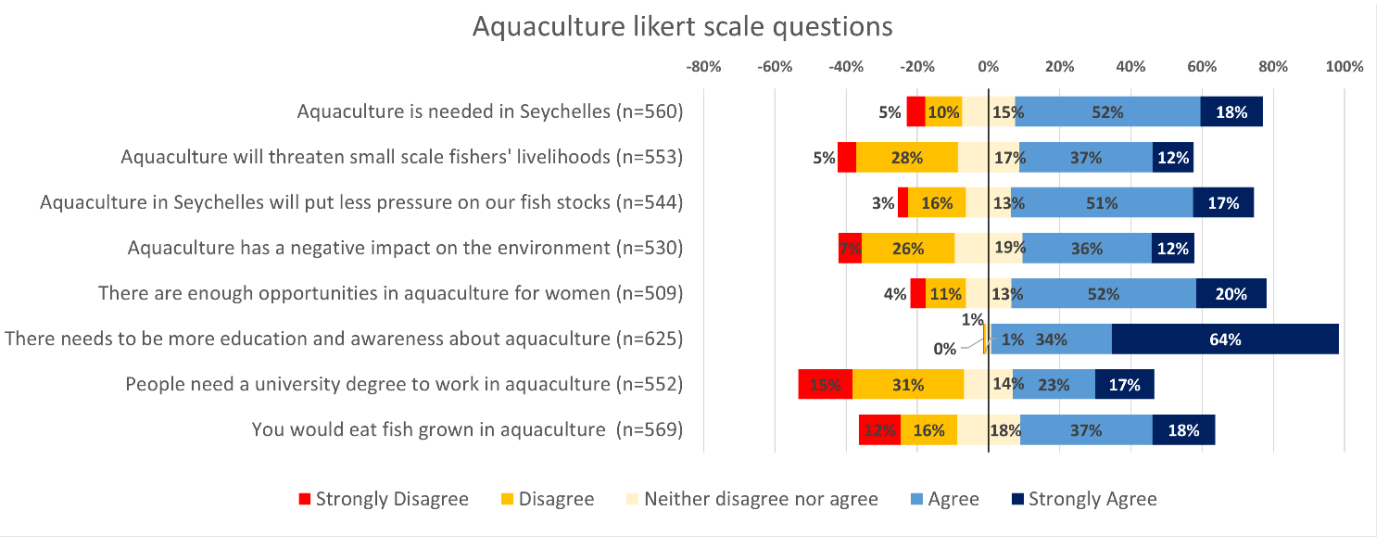

Figure 17: Graph showing knowledge on aquaculture based on eight Likert scale questions

Aquaculture satisfaction

Seychellois level of satisfaction with the management of aquaculture was also captured. It's important to note that only 382 respondents answered this question; therefore, the interpretation of the results should be done carefully while considering the response rate. Of those that responded to this question, 65% were satisfied, while 13% were neither dissatisfied nor satisfied (Figure 18). Those who were satisfied also dominated when sex, island, and age groups were considered (see Appendix 3: Supplementary graphs). However, it might be too early to assess the level of satisfaction with aquaculture management since specific species and their recorded progress need to be considered. The decline in sea cucumber fisheries that serve the Asian dried seafood market has prompted an increase in global sea cucumber aquaculture. In this context, the tropical sandfish (*Holothuria scabra*) has been reared and produced with mixed success. In the Western Indian Ocean, villagers often

participate in the export fishery for sea cucumbers as a source of income. With a growing concern about depleted stocks, the introduction of hatcheries to farm sandfish as a community livelihood and replenishing wild stocks is being promoted (Eriksson et al., 2012).

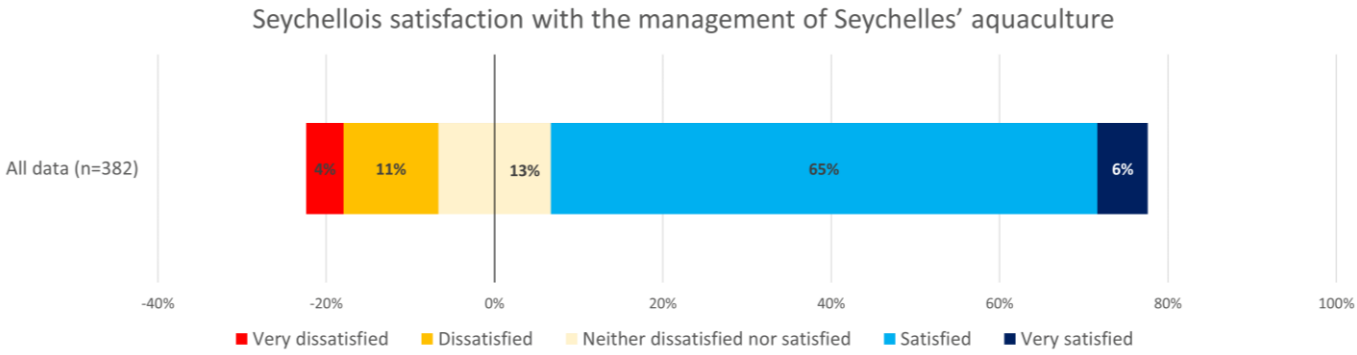

Figure 18: Graph showing Seychellois' level of satisfaction with the management of Aquaculture

Blue Economy

Blue Economy knowledge

Self–reported knowledge of the Blue Economy in Seychelles saw a high response rate (650) that was dominated by a neutral (47%) or knowledge scarce (41% low or very low) familiarity with the concept (Figure 19). Seychelles was an early adopter of the Blue Economy concept, illustrating the political will to support it by establishing a Department of Blue Economy in 2015. Since then, though, a formal, unified definition appears to be lacking, particularly in the public domain. This is not an issue unique to Seychelles as a formal, internationally accepted definition of the Blue Economy still appears to be lacking (Wenhai et al., 2019). Due to its all-encompassing nature, when definitions do exist, sectors that are included appear to drive their agenda as the primary component of the Blue Economy (Lee, Noh & Khim, 2020). Seychelles would benefit from a clearer, or well communicated, definition of its Blue Economy to empower its citizens with confidence when relating to the concept. In spite of the low knowledge across the sample, those 65 and older proclaim to have far lower knowledge (72% low or very low) of the concept than other age groups, whilst those aged 25-30 also show a lower knowledge when compared with other age groups (50% low of very low) (see Appendix 3: Supplementary graphs).

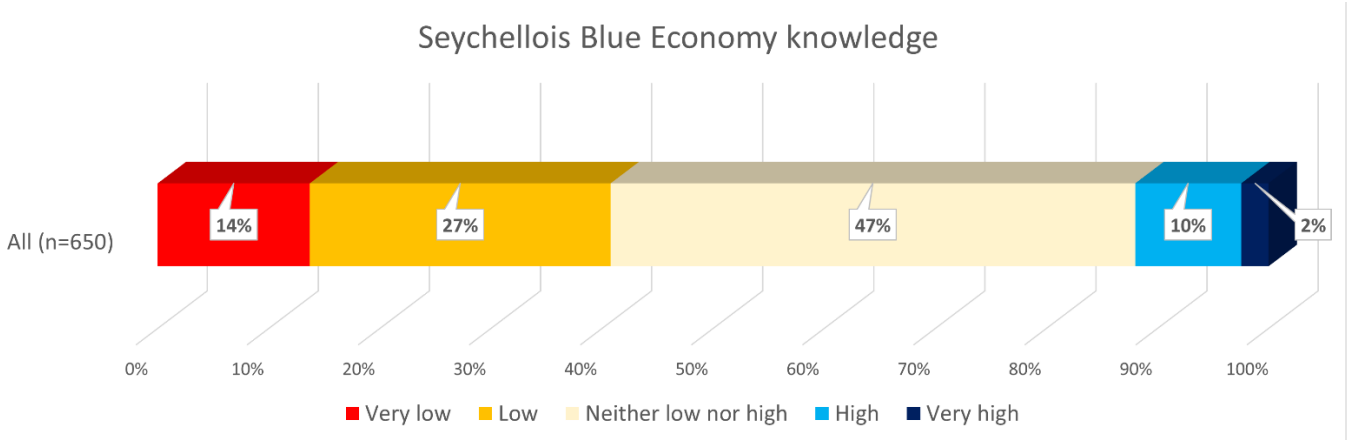

Figure 19: Graph showing Seychellois' knowledge on Blue Economy

Blue Economy Likert questions

In Seychelles, the Blue Economy is viewed in an environmentally supportive frame. Of the respondents, 91% agreed or strongly agreed that the Blue Economy promotes protection of marine resources (Figure 20). This sentiment is supported by general attitudes toward Oil and Gas exploration by respondents, where only 26% were in favour of such ventures (see Ocean management Likert questions, Figure 3). The concept is also viewed with an equity lens, as most respondents (81%) agreed or strongly agreed that the BE has been good for the business environment in Seychelles, 84% agreed or strongly agreed that it promotes healthy lifestyles and 84% agreed or strongly agreed that it drives the agenda of sustainable wealth creation. In spite of these positive responses, there are barriers that the respondents have experienced in terms of BE definition, employment and information access. These three categories scored somewhat lower than others, yet in all cases over 50% of the responses were still positive about the issues. Nonetheless, 84% of respondents considered the BE to be relevant them. This makes the need for clear and unified communication of BE information all the more important.

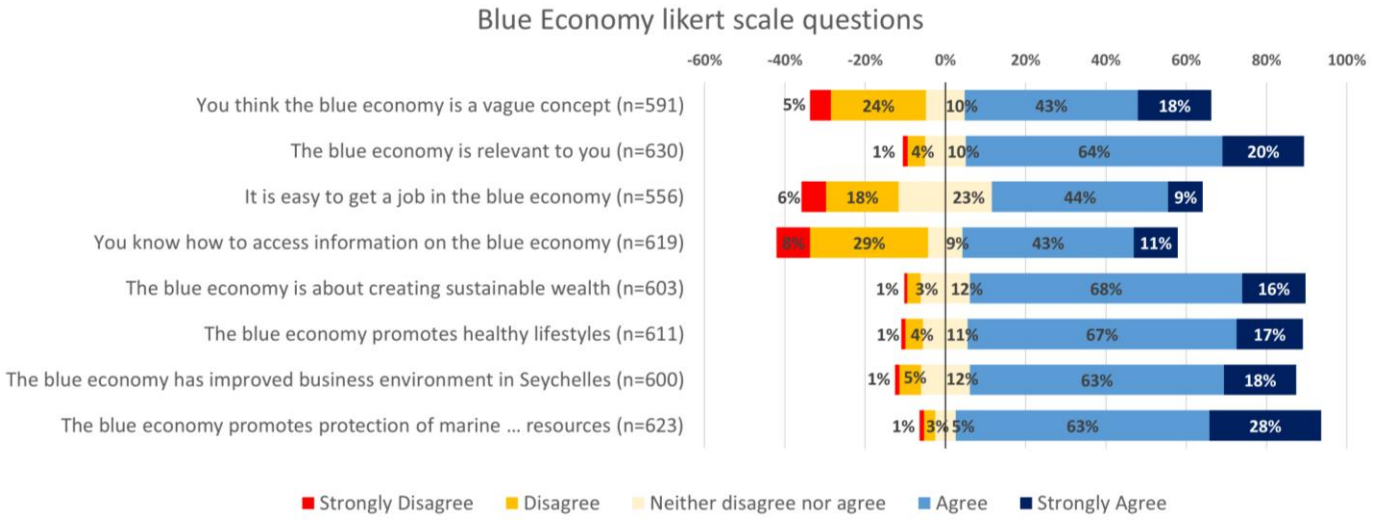

Figure 20: Graph showing respondent perceptions on Blue Economy based on eight Likert scale questions

Communication, Education and Awareness

A specific aspect of the terms of reference for this project focused on communication, education and awareness relating to the topics included in the study. Of specific interest was those relating to marine environment management measures. Consequently, the survey was designed to elicit specific information regarding how respondents receive their news and information, as well as their knowledge relating to the most fundamental aspects of marine management covered by this project, namely their awareness of the marine spatial plan, their knowledge of marine protection in Seychelles' EEZ, and their familiarity with the Blue Economy concept. These questions were posed early in the survey as they were considered to be straight forward in nature and could be used as 'warm up' questions, giving respondents the chance to warm to the enumerator and the survey process.

The results of the questions relating to the fundamental aspects mentioned above are presented here, with a discussion of the results. Several recommendations have been made based on the data gathered and interpreted here, as well as from the survey process in general. These recommendations are presented in the following chapter.

Have you heard of the Marine Spatial Plan in Seychelles?

Seychelles' Marine Spatial Plan (SMSP) has been ongoing since 2014. During this time the SMSP team has conducted significant stakeholder engagement with user groups from 11 marine sectors. In spite of this public engagement, of the 670 respondents to the question *Have you heard of the Marine Spatial Plan in Seychelles?* 42% indicated that they had not, and 45% stated that they had (Figure 21).

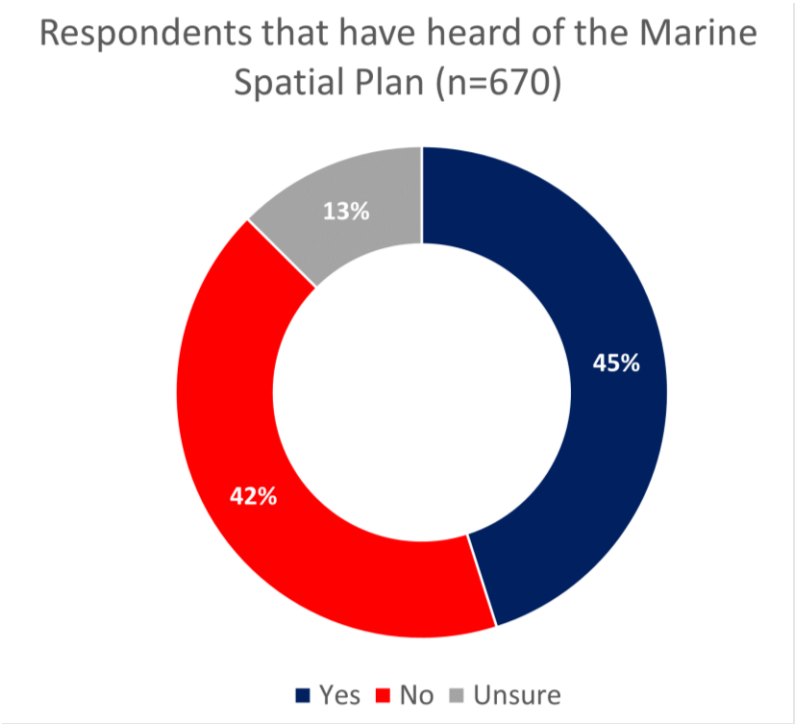

Figure 21: Percent of respondents that have heard of the Seychelles Marine Spatial Plan

Interestingly, there appeared to be significant differences in awareness of the SMSP depending on age. The youngest age group interviewed – 18 to 24 year olds – were the least likely to have heard of the SMSP (61%) (Figure 22). When combined with the following age group, it can be shown that 54% of the youth in this sample had not heard of the SMSP. Internationally it has been demonstrated that this can be the case. An angler perception survey in Spain found that anglers showed limited understanding of management measures (Cardona & Moreles-Nin, 2013). The awareness of the SMSP has an upward trend until the 65 and over category, where those that were uncertain whether they had head of the MSP represented 18% of the age group.

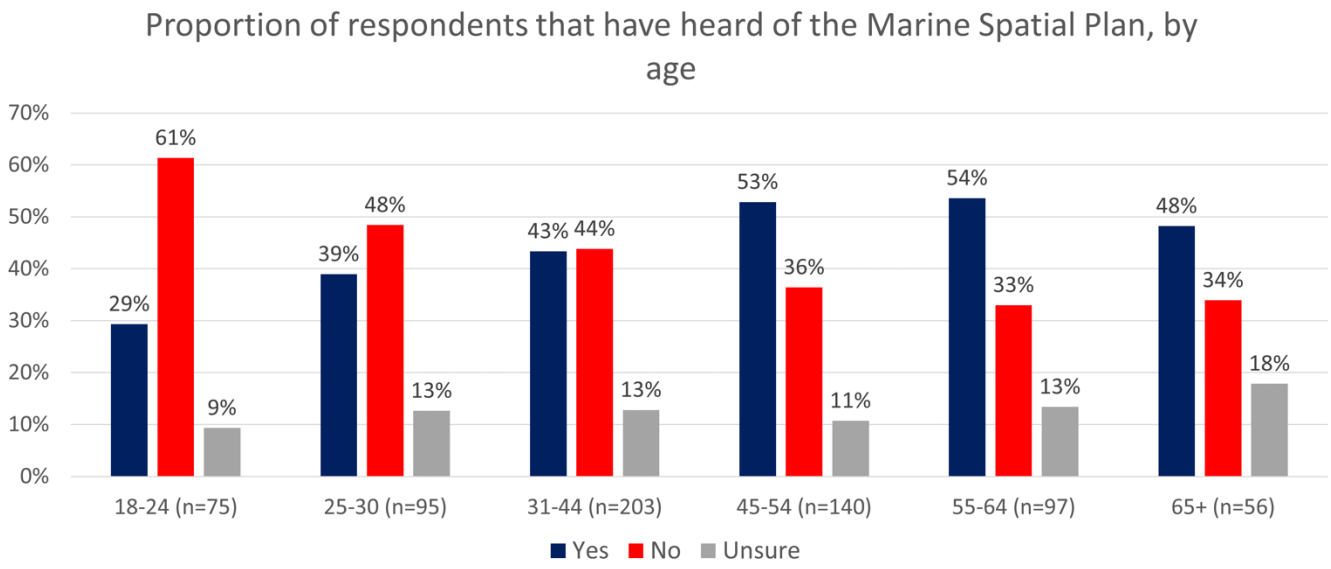

Figure 22: Proportion of respondents that have heard Seychelles' Marine Spatial plan, by age

How much of Seychelles' waters are protected, or fall in marine protected areas?

In 2020, Seychelles increased the area of its exclusive economic zone (EEZ) under protection to 30%, leading to a total area of marine protection of just greater than 30% of its EEZ. The SMSP and the increase in marine protected areas (MPAs) is a necessary output of the Seychelles Debt restructuring and the MPAs were gazetted in March 2020. The implementation of the SMSP is planned for 2023. Respondents of the survey were asked the question *How much of Seychelles' waters are protected, or fall in marine protected areas?* to investigate the current level of knowledge and awareness. Of the 669 people that responded to the question, 18% were correct by answering 'About 30%'. The two most common responses were '>45%' (26%) and 'Unsure' (23%). The low awareness relating to the area of EEZ under protection is likely due to the SMSP not having commenced the implementation phase of the project yet.

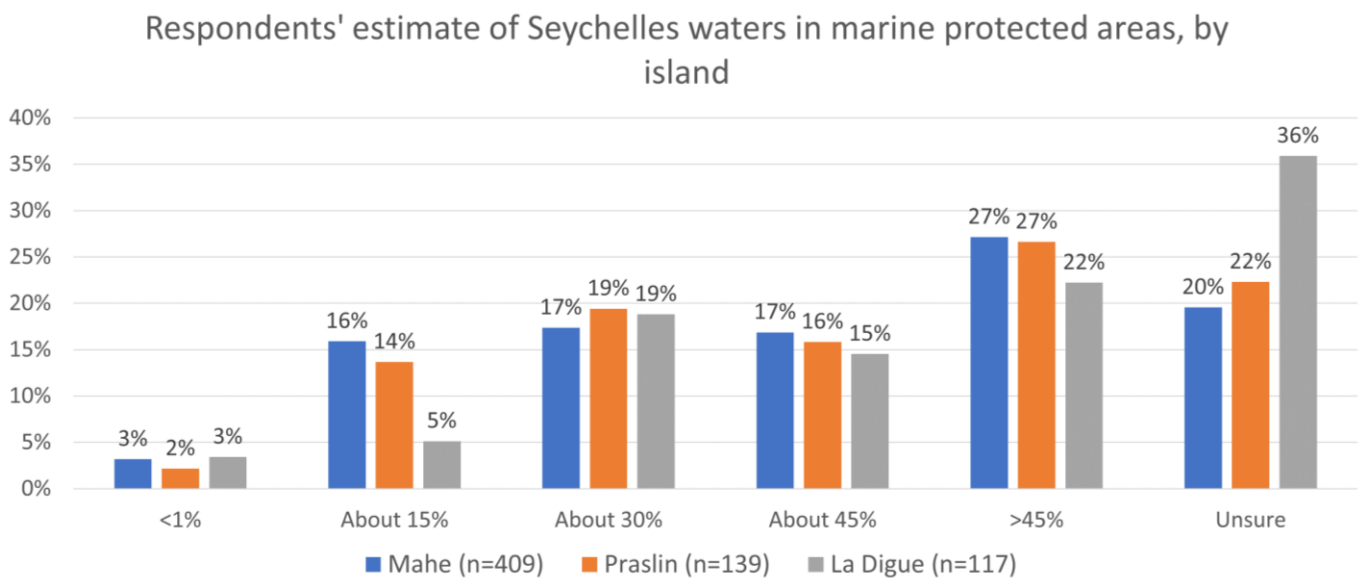

Figure 23: Respondents' estimate of Seychelles waters in marine protected areas, by island

These data were further disaggregated to elicit trends across islands (Figure 23) and across sex (Figure 24). A significant proportion (36%) of respondents from La Digue were 'Unsure' of the area MPAs. Most respondents from Mahé and Praslin islands thought that Seychelles had '>45%' of its waters in MPAs (Figure 23).

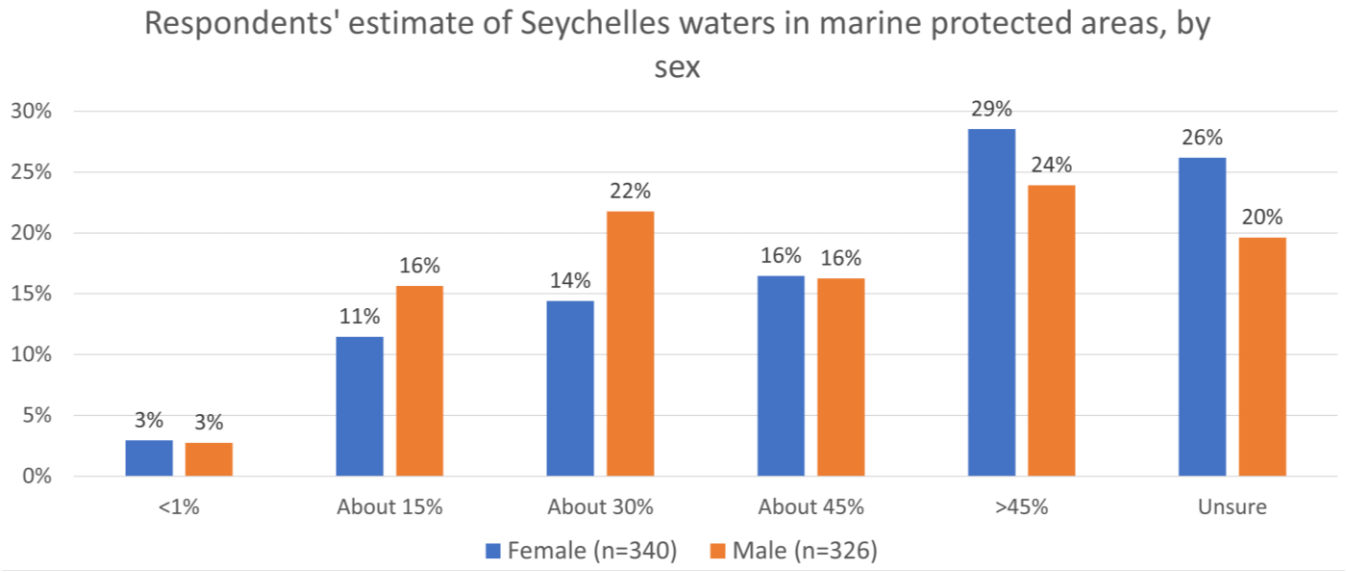

Figure 24: Respondents' estimate of Seychelles waters in marine protected areas, by sex

When considering the level of MPA protection by sex, females appear to be less certain of the actual level of protection, firstly with one-quarter being 'Unsure' and secondly with almost 30% selecting '>45%' as the answer. Whilst males had a high level of responses for 'Unsure' (20%), and almost one-quarter of respondents (24%) stated that the area of MPAs was '>45%', 22% did get the answer correct, which is considerably higher than females (14%) (Figure 24). Such disparity between males and females could be a combination of factors. One plausible reason that has been cited earlier links

to the fact that culturally, fishers are mostly males, with greater interaction with the ocean space. Therefore, they are likely to know more about the percentage of Seychelles' MPA when compared to females that operate at different levels in the fisheries value chain. This explanation should not be seen as conclusive, as there might be other factors responsible for such disparities that were not fully captured. For example. Who are those that often attend meetings on fisheries-related issues?

Have you heard of the Blue Economy in Seychelles?

There has been significant international and regional high-level momentum on the Blue Economy with documents such as *Africa Blue Economy Strategy* (AU-IBAR, 2019) and the *Blue Economy Regional Action Plan* (Indian Ocean Commission & UNECA, 2021) being published. Seychelles, being at the forefront, has carried its momentum forward, publishing its *Blue Economy Roadmap* (Republic of Seychelles 2018), the *Seychelles Blue Economy Action Plan* (UNECA & Department of Blue Economy, 2020) and *The Blue Economy in Seychelles: Socio-economic and ecological assessment of the Blue Economy in Seychelles* (UNECA, 2021).

At the broadest public level, the development of Seychelles Blue Economy has captured the attention of the nation, which is supported by 93% of respondents having heard of the Blue Economy, a significant proportion (Table 5). However, when delving deeper into public understanding of the concept, only 12% reported their knowledge of the Blue Economy to be high or very high. Further concerning results show that 61% (Table 5) of the respondents perceived the Blue Economy to be a vague concept with 10% being neutral, indicating that there is likely to be poor understanding of what the blue economy means in Seychelles.

Table 5: Responses to three questions relating to familiarity with the Blue Economy concept, including number and percent of responses

Respondents:	Number	Percent
Have heard of the Blue Economy (n=671)	623	93%
Have high or very high knowledge of the Blue Economy (n=650)	78	12%
Agree or strongly agree that the Blue Economy is a vague concept (n=591)	363	61%

How do you usually get your news?

This consultancy included an intelligent strategic component. The client had interest in understanding how the public accessed their news and information. Consequently, the survey included a question titled *How do you usually get your news?* Which gave respondents one of six options: Online, Facebook, Radio, TV, Newspaper and Other. Respondents were able to select more than one option, providing insight into their approach for accessing their information.

In the survey, 668 people answered the question (Figure 25). TV (89%) was by far the most common source for respondents, with radio (46%) being the next most popular. Online (39%) and Facebook (37%) attract a fair proportion of respondents, with the assumption being that 'online' could comprise other social media platforms and online news sources. Newspapers were surprisingly low with 20% of respondents indicating this medium as their source, whilst 6% mentioned another medium. It should

be noted that 73.5% of respondents get their news from 2 sources and 45.7% get their news from three sources, showing that a mixed media approach for targeting the public is a viable approach.

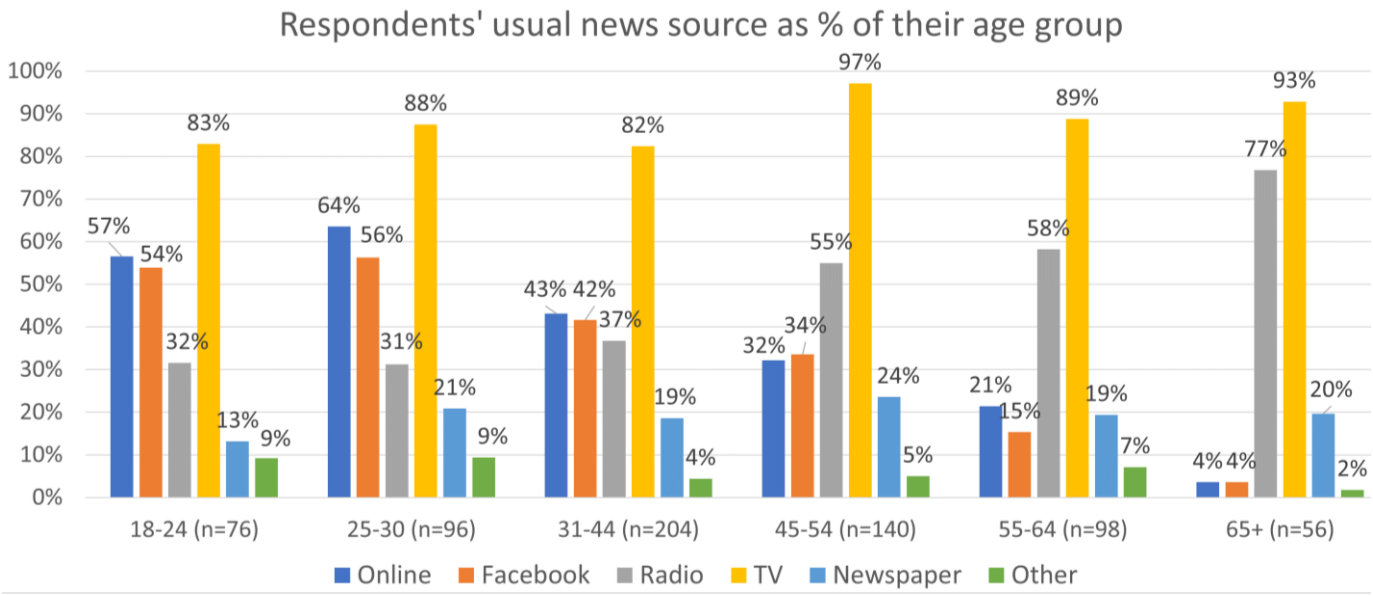

Figure 25: Respondent's usual news source as a percent of their age group

When looking more closely at how media is consumed by the public, there are definite trends when this is considered by age group. TV consistently performs as the primary news source across generations, but is more prevalent in older age groups (45 and older). Online and Facebook are clearly the second and third most common sources of information for the youth (18-30). Radio, on the other hand, increases its relevance as a source from the age of 45, with it being an obvious avenue to pursue from age 55 onward. Newspapers appear to capture a steady ~20% of respondents across age groups, aside from the youngest group of 18-24 year olds (Figure 25).

How often do you attend public meetings regarding the ocean?

Important for the success of any policy, law or initiative that includes the general public is consultation with the stakeholders. Often the use of online tools or resources will exclude many from a consultation process, particularly when wanting to engage with older generations (see previous section). In-person meetings and consultation sessions are effective means of sharing information in a more inclusive manner, allowing for those present to gain additional insight into the initiative being presented. Public meetings also present an avenue for communities to come together in a unified manner to support or disagree with initiatives being presented. In spite of the importance of public meetings, it appears that those that are in relation to the ocean have been poorly supported in Seychelles.

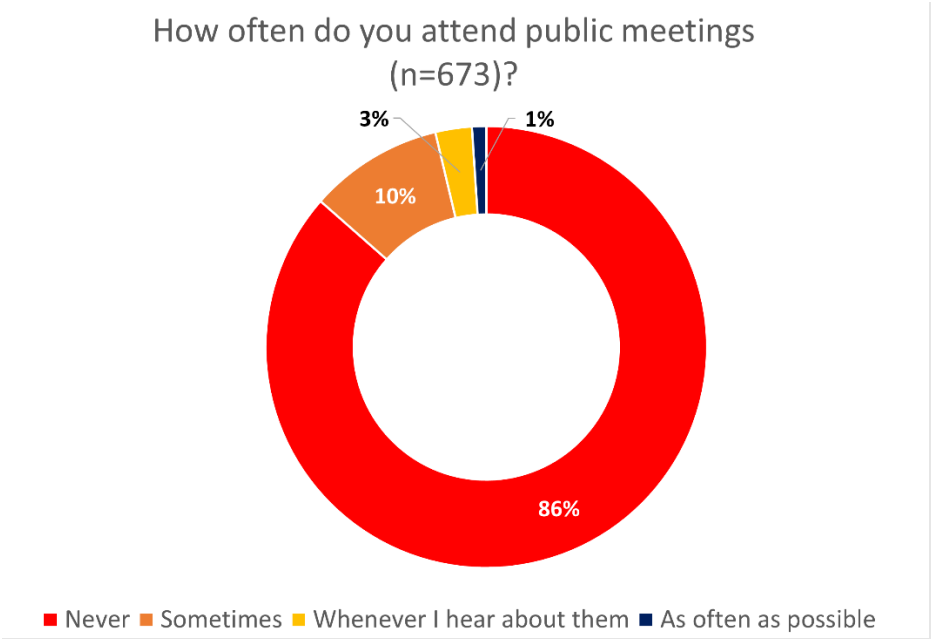

Figure 26: Respondent frequency of attendance of public meetings regarding the ocean

The question *How often do you attend public meetings regarding the ocean?* was posed to the respondents, which had 673 individuals provide a response (Figure 26). As with other questions in the survey, the question discussed here was not time-bound, meaning it related to respondents' history of attendance of ocean-related public meetings. Of these, a highly surprising 86% indicated that they 'Never' attend public meetings regarding the ocean, and only 1% stated that they would attend such meetings 'As often as possible'. When considering a response to a question later in the survey which queried whether respondents know where to find information on public meetings, 54% said they did not know where to find such information whilst 39% indicated that they did know. In spite of just over half the sample being unaware of public meeting information, the almost 40% of respondents that were aware could be expected to translate into a higher attendance rate of public meetings.

Poor public meeting attendance is a point of concern as these are platforms and opportunities where the public can engage in two-way communication with specialists or project proponents, resulting in opinions being heard, creating shared learning opportunities for both parties (US EPA, 2022). Information provided in traditional forms such as newspapers, websites, social media and television is one-way in nature, limiting input from, and engagement with, the public (Suldovsky, 2017). This can impact the public's understanding, interpretation and reservations of a subject (Suldovsky, 2017). In this survey, respondents' low attendance could be attributed to poor meeting awareness, as mentioned above, possibly due to communication channels being ineffective. Another plausible explanation is that respondents may have had negative experiences at past meetings, such as not having their contributions taken into consideration, and consequently no longer attending them. Improved public meeting attendance would be beneficial to ocean-related initiatives in Seychelles going forward.

Responses to sections

A shorter survey and a decrease in the likelihood of respondent fatigue was a crucial consideration in order to enhance the effectiveness of data collation. As the survey period progressed, enumerators became more familiar with delivering the survey and became less concerned about its length. Upon analysing the time taken to complete an interview, it was found that 54% of surveys were completed in less than 20 minutes and 74% of surveys were completed in less than 27 minutes (n=518).

In combination with possible length issues, the survey broached two sections that were considered to be new or foreign in content to respondents, those being Fisheries Value Chain and Aquaculture. When respondents are presented new or foreign concepts in surveys, response rates often decrease as respondents battle with the cognitive strain of processing this information. Consequently, we analysed the responses across the five sections to assess 1) whether the survey length affected response rates, and 2) whether the unfamiliar sections affected response rates.

When considering whether length of survey would affect survey length the likely situation is for response rates to continually decline throughout the survey. As can be seen in Figure 27, this was not the case. The average number of responses in the first and second sections was approximately 640, dropping significantly, and rebounding to approximately 620 for the last section, Blue Economy, which is a topic that most (93%) respondents are familiar with. Consequently, it can be concluded that the length of this survey did not affect the response rate.

In terms of the effect of unfamiliar content on response rates, it is clear from Figure 27 that the Fisheries Value Chain and Aquaculture sections both saw high decreases in the average number of responses, which dropped to ~570 and ~550 respectively. These amount to decreases of approximately 11% and 16% in respondents from the 640 average of the first two sections. It is more likely then, that foreign nature of these two topics affected their response rates as opposed to survey length, seeing as the response rate for the last section was comparable to the first two sections.

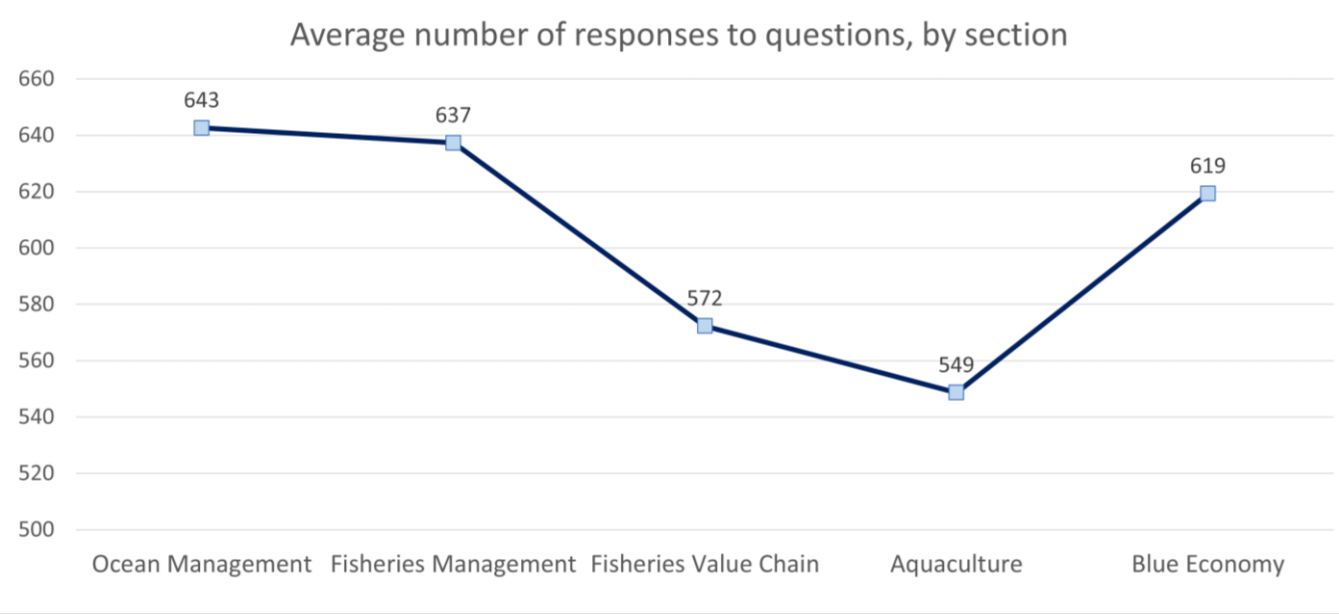

Figure 27: The average number of responses to questions, by section

End of survey comments

The survey was designed in such a way that respondents were given the opportunity to provide comments. The opportunity to comment had no leading approach, meaning respondents were free to comment on any topic, be it one of the sections or the characteristics of the survey itself.

There were 105 voluntary comments received, which can be accessed in Appendix 4: Comments from respondents.The comments were not edited, but were categorised in two ways: by the main issue that the comment appeared to raise or address, and the primary theme or section that the comment related to. These classifications and the number of comments relevant to each are captured in Table 6. The most commented upon issues were Information (56), Regulation (26) and General (13), with the three most commonly commented upon themes were being General (43), Fisheries Management (20) and Blue Economy (17).

Table 6: End of survey comment numbers, by issues and themes

Issue	Number of comments	Theme	Number of comments
Access	1	**Aquaculture**	6
Development	4	**Blue Economy**	17
Economics	3	**Communication**	15
Facilities	2	**Fisheries Management**	20
General	13	**Fisheries Value Chain**	2
Information	56	**General**	43
Regulation	26	**Ocean Governance**	2
Total comments	**105**	**Total comments**	**105**

In the issue of information, the comments primarily focused on the need for additional education, awareness, information and/or knowledge on the carious topics. From this standpoint, the comments provide useful insight into needs identified by some respondents.

It must be noted that whilst having comments is useful and insightful, comments will usually come with an avidity bias where those that are most interested or vested in the topic will make their voice heard. Excessive emphasis placed on comments can result in biased conclusions being drawn. Thus, the comments are useful, important and insightful, but should not be treated as representative of the sample.

Challenges and Recommendations

In spite of this project's success, there were difficulties that the consulting team had to transcend. Similarly, there are opportunities for improvements to be made for future iterations of this, or a similar study. After sound interaction within the consulting team, with respondents and the general public, as well as the invaluable feedback from the enumerators, several recommendations have been proposed to assist the client in making sound, informed decisions going forward.

Challenges and improvements

1. Accessing difficult to reach respondents

In some instances it was noted that respondents set far back from the main road, or in comparatively difficult to reach locations were not accessed. This was due to a number of reasons, three of which are presented here.

i) Low return on time for the enumerator: venturing into hard to access areas requires additional effort and time commitments for an uncertain return. These are discouraging factors for the enumerators
ii) Low density of housing: in the upper reaches of any of the islands, the difficult to reach areas also appear to be sparsely populated, meaning more travelling is required for a comparatively lower number of responses.
iii) Accessing difficult to reach areas leads to isolation: with properties having a low density in the remote areas, enumerators would be more isolated which can lead to increased risk for their safety

Solutions to this challenge are hard to implement. One idea is to have a dedicated team for the remote areas that expect lower returns in terms of survey numbers, but that are willing to put in the extra effort. A second is to have a longer survey period to ensure that these locations are captured. Lastly, having more males in the survey team could assist in mitigating the risk of having teams in remote locations.

2. Ensuring a fully representative sample

The survey team attempted to capture a representative sample of the Seychelles public. This was achieved in terms of sex ratios, however was narrowly missed in the youth and more broadly missed in the older generations (see Table 3). To address this in the future more concerted effort should be focussed on targeting the older generation, whilst the younger generation should not be sampled as avidly. Solutions here include accessing more old age homes, approaching Church congregations after services, and specifically requesting for the older household members when approaching respondents. A second suggestion is to include more regular assessment of the sample during the survey period. However, this can introduce its own biases as some areas would have specific demographics targeted, skewing the representation of opinions from that area.

3. Assess information gathered for effectiveness

The client should review the information gathered from the survey for its specific use. Criticising all the questions for relevance and necessity will lead to the exclusion of those that are extraneous. There are several benefits to this, including a shorter survey, which results in less time required of

enumerators and respondents which decreases cost and both enumerator and respondent fatigue; and more focused reporting, as more of the data is used and included in analyses.

Recommendations

Several recommendations are presented below based on the results of this consultancy.

1. Communication strategy

A communication strategy is critical to ensuring that future iterations of this study, or a similar one, yield improved results. The communication strategy suggested here should be the primary means of engaging with the Seychelles public. It can be used in isolation, in conjunction with, or to support the other recommendations mentioned below.

According to Hyland-Wood, Gardner, Leask and Ecker (2021), when communication strategies are well conducted, public trust, confidence and compliance are consequential benefits. However, in order for such results to be expected, transparency is important. A lack of transparency can quickly result in the loss of trust, which is difficult and costly to regain. It is recognised that there is no one-fits-all approach for communication strategies due to the diversity of the target audience, and that two-way communication, or an interactive platform for communication, is necessary (Hyland-Wood et al., 2021; Araujo and Kollat, 2018).

Hyland-Wood et al. (2021) mention ten factors that should be considered as key tenets of a communication strategy (see Appendix 5: Factors for consideration in a communication strategy). Araujo and Kollat (2018) add to this, insisting that an engaging strategy, that can include emotion and the aspirations of the organisation, are far superior to deficit model, or one way communication, strategies. Bearing these factors in mind, the following communication strategy is suggested for the dissemination of this consultancy's results, as well as to increase the awareness and education of the topics that it covers. It is simple, principle driven approach that can be easily adopted according to the specific campaign needs.

The communication strategy has four steps that are repeatable, based on funding and resources available, as well as intention of the communication strategy, captured in Figure 28.

i) Initial main media release (MMR): The first step is the initial MMR, which should be conducted using television (TV). TV was by far the most used source of news and information across age groups, islands and gender of respondents, ensuring that the initial MMR reaches the largest audience. To increase the reach of the release, advertising on social media and newspapers could be done preceding the program. A repeat of the MMR is highly encouraged, as not all public may be watching the TV on the release day.

ii) Question-based campaign: A follow-up, question-based campaign should be conducted shortly after the MMR. This should be advertised during the MMR to provide awareness of the campaign. This can target specific demographics by using most relevant media option. Multiple media options concurrently could be used concurrently. As has been discussed, social media platforms should be used for younger audiences, and radio for older generations. A question-based campaign, particularly one run on radio and social media, where two-way engagement is possible, will allow information from the initial MMR to be consolidated, and for the public to ask additional questions. If prizes are attached to the campaign there is likely to be greater buy-in, fostering increased

community knowledge dissemination as the public talks about the campaign, the questions and the answers.

iii) Intermittent on-going polling and knowledge sharing: Releasing information continuously over time helps to consolidate knowledge. Using polls and short question and answer sessions increases knowledge consolidation and enables the communication team to measure changes in knowledge, response and attitudes toward the topics over time. Here the main media avenues include email lists, facebook and social media platforms, with radio being possible too. An active account that can gather quick information in fun, informal and visual ways would be beneficial, such as the use of Instagram polls.

iv) Community events: The avenue that will build the highest level of trust is in-person community events. This is of particular importance for older generations, less literate or technologically savvy, and for La Digue. Much of the anecdotal public perception toward government led initiatives was that the people of La Digue did not matter, and in the event that they were consulted that the decisions had already been made. In-person events require the most planning and are resource intensive. However, they also open up the possibility of showcasing additional work, of partnering with multiple institutions or partners, and of creating additional awareness around other causes simultaneously, such as national or international days.

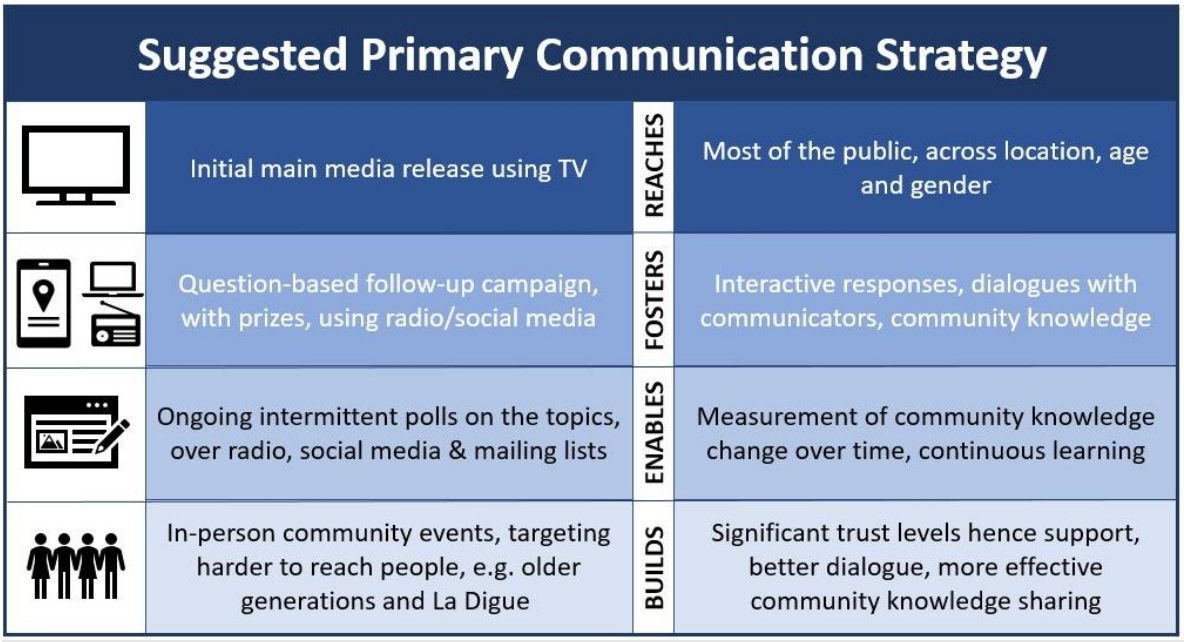

Figure 28: Suggested communication strategy for the effective dissemination of survey results

The above four steps should be cycled until the desired result is obtained. It can also be adapted according to the human and financial resources available at that stage in the project.

For the strategy to have a greater chance of succeeding, the following should be adhered to:

- Content committee: Content created should be done so in conjunction with a small communication team or committee, comprising of members of communities and the general public, or at the very least people from outside the organisation. It should not be comprised of only employees from the communicating organisation.

- Trustworthy figureheads: Messages, quotes and facts are effective means of sharing information. However, if the individual sharing the message, the person quoted, or the facts shared are not from trusted members of society or reputable sources, civic trust will be eroded. Trust is the single most important factor in communication (Hyland-Wood et al., 2021). Using political figures is viable if they are regarded as reputable, transparent individuals. Where this may not be the case, preference should be given to professionals in the field or upstanding public citizens. In the case of new knowledge, internationally reputable sources and authorities could be used, cited by a well-respected local expert.
- Two-way communication: Those receiving the information should always feel that they have a voice, that their concerns can be heard, and that their opinions, or misgivings, matter. The information providers should make clear what avenues the public have to interact with them, and what the public should expect when engaging with them. Transparency is of great importance.

2. Targeted communication releases

The client would benefit from using the information found in this document to construct communication strategies that improve the effectiveness of their campaigns. Understanding what specifically needs to be communicated is the first step in knowing the campaigns target audience. Once a targeted audience has been identified, the client can refer to the previous chapter for the best means of communicating results, based on cost and age. When cost is of little concern, and information is audio-visual in nature, TV has by far the greatest reach across all age groups in Seychelles. It should be the default communication strategy when possible, and given any information constraints. For more targeted campaigns that may have limited financial resources, information that targets 18-30 year olds should be released online, through news websites and social media platforms. On the other hand, when targeting age groups 45 and older, the use of radio is an effective and cheaper alternative to TV. This form of communication is particularly useful when targeting those 65 years and older.

It is important that any media campaign be carefully assessed for how the information is best released to the public before settling on the method of release.

3. Communicating of results

During the survey, respondents were vocal in their desire to be informed of the results of the survey. Communicating the results with the broader Seychelles public is deemed to be of paramount importance to increase the likelihood of high participation rates in this and similar surveys going forward. A disgruntled public is less likely to be forthcoming with information and their time.

Such communication should not be through the District Administrations, but rather through specific targeted releases, particularly as a repeated program on TV. A targeted media campaign could be designed using the information from the previous chapter.

4. MSP and MPA awareness campaign

The Seychelles Marine Spatial Plan (SMSP) has been viewed as a success by many stakeholders locally, regionally and internationally. Yet, the survey revealed that a significant proportion of respondents were unaware of it (42% - see *Have you heard of the Marine Spatial Plan* in Seychelles?). Similarly, Seychelles' recently proclaimed marine protected area expansion has been well recognised

internationally, however, locally, knowledge of the extent protected is low (18% - see *How much of Seychelles' waters are protected*, or fall in marine protected areas?).

Consequently, a campaign that specifically addresses these shortcomings should be initiated by, or suggested by the client to, the relevant parties. This would help address the concerns of a lack of education and information regarding topics in the survey.

5. Blue Economy clarity and awareness

The Blue Economy is a concept that is well recognised by the public in Seychelles, with 93% of respondents having heard of it. Nonetheless, it continues to a topic that is poorly understood. Several comments by respondents indicated that further education and information on this topic was required to help educate the public, a request that is backed up by evidence in the survey (see Table 5).

Achieving the task of providing more information, clarity and awareness on the Blue Economy has its challenges, as it first requires a unified and centralised definition within the country, which has been absent for about 8 years. Nonetheless, having sound evidence for this need may be what is required for the relevant government ministries to act on this.

6. Focussed attention on Fisheries Value Chains and Aquaculture

The number of responses to questions during the Fisheries value chain and Aquaculture topics serve as evidence for poor understanding and familiarity with these topics. This is corroborated by anecdotes from the enumerators who continuously mentioned that the majority of respondents were unfamiliar with these topics, often losing interest in the survey once these topics were broached.

As these topics grow in their importance for Seychelles' Blue Economy and the nation as a whole, it would be prudent to have a public that is aware of, and understands, these sectors. This could increase the likelihood of participation in these supply chains and industries, and increases the likelihood of innovation associated with them.

7. Education on catch and release techniques

Seychelles is transitioning to a managed fishery, leaving its open-access history behind. In doing this it is introducing some measures that require paradigm or behavioural shifts, as well as an understanding of what is possible. These are directly linked to the publics interaction with fisheries management and their understanding of ocean governance. The survey revealed that 90% of respondents either agreed or strongly agreed that size limits should be introduced for certain species. The concept of catch and release is growing, and is expected of artisanal, sports and recreational fishers alike. There are misconceptions, that are not necessarily misplaced, regarding the effectiveness of catch and release. When poorly executed, fish mortality is high, warranting fishers argument that they should rather keep caught fish, as releasing them is ineffective. Nonetheless, as new management measures are enforced, fishers will have to release certain species or certain fish sizes, thus will need to learn how to handle and release fish safely.

Workshops and information sessions should be held to educate fishers on effective catch and release methods, the gear that may be needed, as well as what actions are required under different circumstances. Effective means of instilling lasting change would be to educate two champions in each fishing association, who can then educate their peers. Further, education on the value of living fish versus dead fish should be released to Seychellois as well as visiting fishers alike. To protect the

country's resources, the country needs to be the driver of the change, not expect others to be the driving force or to toe the line.

8. Focussed campaign on La Digue

There is sentiment on La Digue that it is the forgotten island. This comes through in several of the comments at the end of the Survey, as well as from the sentiment of the islanders during the survey trip. The perception is that decisions are made for La Digue about La Digue, with little consultation. These decisions are assumed to be made on Mahé and imposed on La Digue. In the spirit of nation-building, there should be more concerted inclusion of La Digue dwellers in decisions made that affect the island. Two-way communication should be used as opposed to the prescriptive approach which often appears to be the norm.

In attempting to rectify this, there should be awareness that in this survey the vast majority indicated that they never attend public meetings regarding the ocean, meaning communicators would have to work hard to overcome barriers associated with this.

9. Understand the reasoning behind education and awareness

Education for education's sake is unlikely to be effective. It is important that any education and awareness initiatives that emanate from this work have the planners considering *why* they are conducting the initiative. Understanding *why* the initiative is taking place will ensure more compelling arguments, discussions and approaches to the education and awareness, increasing its effectiveness. Understanding who the campaign is targeting further allows for more effective planning of the initiative to increase its success.

Conclusion

This project was a baseline assessment of the Seychellois public's perception toward ocean governance, fisheries management and the blue economy. The initial approach was to focus on the three topics mentioned, however after consultation with focus groups it became clear that the term 'ocean management' would be a better substitute for 'ocean governance', and that fisheries management should be disaggregated to include both fisheries value chains and aquaculture too, which were viewed to be standalone topics.

The survey included co-design from the client, where they reviewed several iterations of the survey, reviewed the translation of the survey and held a productive review after the pilot phase and before release of the final version. This ensured that the client was happy with the design and the questions included.

The survey used educated, well-trained enumerators to execute the survey under close supervision from members of the consulting team. Having youthful energy assisted in the success of the survey, as well as having the option for respondents to participate in English or Creole. Administering the survey via tablet and smart phone reduced the burden of transcribing surveys from paper to computer-based spreadsheets. The 674 usable surveys significantly exceeded the expected number, and produced interesting insights into the public of Seychelles and their perceptions toward the topics presented, as well as attitudes toward the beach and coast in general. The survey was as far as possible conducted to emulate the stratification of the Seychelles demographics in terms of sex and age. This was certainly achieved in terms of sex, and was achieved with minor variance for the age structures.

The specific indicators that this consultancy sought to answer were the proportion of Seychellois that:
Seychelles marine protected areas

1. rate the management of sustainable use marine areas as 'Satisfactory' or above, and
2. rate the management of selected fisheries as 'Satisfactory' or above.

The first indicator was posed to the respondents in a broad manner, querying satisfaction with 'the management of Seychelles MPAs', for two primary reasons: i) implementation of the SMSP has not yet commenced, meaning that rating the management of the sustainable use areas cannot be done yet, and ii) to limit confusion and bias: asking respondents to rate a specific type of MPA (i.e. sustainable use areas) would likely lead to a biased response as individuals would find it too confusing to differentiate between high biodiversity marine areas versus sustainable use marine areas, and subsequently rate only the sustainable use areas. Resultingly, the first indicator referred specifically to established, pre-SMSP MPAs. Taking this into account, it was found that 77% of Seychellois rated the management of Seychelles established MPAs to be 'Satisfactory' or above.

The second indicator was also challenging to interpret as Seychelles has nine recognised fisheries, each with its own nuance. To address this issue, respondents were asked to rate their satisfaction of each fishery. The results were then aggregated to create a composite score of satisfaction for Seychelles fisheries in general, whilst keeping the specific fishery data available. To this end, the proportion of Seychellois that rate the management of fisheries in general as 'Satisfactory' or above was 78%. The artisanal trap (82%) and handline (87%) also scored highly, as did the sports (80%) and recreation (84%) fisheries.

The project also found concerning levels of awareness regarding topics that are considered mainstream by many government and environmentally oriented organisations, but considerably less

so by the public. As a result, further awareness is required regarding Seychelles Marine Spatial Plan and the extension of its Marine Protected Area network. The survey elicited the most effective means of sharing news and information with the respondents, which was found to be TV for all age groups. The second most common news source varied for the different generations, with those aged 18-30 using online and social media as effective means of gathering news and information, and those aged 45 and above using radio as their second most common source.

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Appendices

Appendix 1: English version of survey

Introductory text

Hello! My name is *Say Your Name*, and I am from the University of Seychelles. I'd like to chat to you about a project that we are currently doing. It is a survey designed by the University of Seychelles to understand Seychellois perceptions on some topics relating to the ocean. It is completely anonymous and your information will be treated as confidential, so you can express your opinions as freely and honestly as you like.

Would you like to know more about the survey? Y / N.
If Y, read from Enumerator Info sheet
If N, continue below.

This survey will take approximately 25 minutes to complete. In deciding to participate in this survey you acknowledge that you have been informed about the study and that your responses will be treated confidentially. Are you willing to participate in the survey? Y / N

If N, terminate survey by reading: Thank you for your time and have a nice day.
If Y, Great! Thank you very much! Before we begin, do you have any questions in general?

Warm-up questions

To start with, I am going to ask you a few questions to get to know you a little better:

What is your favourite past time outside of work?	*Record the first option they say*				
Have you heard of the Marine Spatial Plan in Seychelles?	Yes	No			Unsure
How much of Seychelles' waters are protected, or fall in marine protected areas?	<1%	About 15%	About 30%	About 45%	>45%
Have you heard of the Blue Economy in Seychelles?	Yes	No			Unsure
How do you usually get your news? (*Select all that apply*)	Newspaper	TV			Radio
	Facebook	Online			Other:

In this survey we will be using three 5-point scales very regularly that are found on this paper [*Hand the respondent the Respondent Response Sheet*]. You will use these to respond to statements that I say to you. There are 3 different scales, Scale 1 - 3. For the following statement that I will read, we will use **Scale 1** which is the **Agreeing Scale**.
[*Explain Scale 1*]

Do you have any questions about the scales?

[*If Y: answer the questions clearly, and explain the scales well. Prompts are in the Enumerator Info Sheet]*
[If N: continue with the survey]

Please note that there is a big difference between the neutral response – for example 'neither disagreeing nor agreeing' - and having 'no answer'. Only use No Answer if you do not understand the question or information, and **not** if you are indifferent or neutral.

Let's get started. Don't forget to let me know if you are unsure about anything and I will gladly try to explain it. Here are the statements: [*If it looks like the respondent needs support, point to the options or categories during the questions*]

Seychelles has lots of fish	1	2	3	4	5	NA
Tourism is important to Seychelles	1	2	3	4	5	NA
Fisheries are important to Seychelles	1	2	3	4	5	NA
Aquaculture is important to Seychelles	1	2	3	4	5	NA
Fisheries value chains are important to Seychelles	1	2	3	4	5	NA
The Blue Economy is important to Seychelles	1	2	3	4	5	NA
The beaches and ocean are an important part of your cultural identity as a Seychellois	1	2	3	4	5	NA
As a Seychellois, it is your responsibility to protect, preserve, and improve the environment	1	2	3	4	5	NA

Let's move on to some other questions now. First, we are going to talk about ocean management.

Ocean Management

Using **Scale 3**, how would you rate your knowledge of ocean management in Seychelles?

Very low	Low	Neither low nor high	High	Very high

We are going to use **Scale 1** for the following statements. Please ask me if you need any clarification. Here are the statements. For you, ocean management means:

The management of ocean resources	1	2	3	4	5	NA
Rules and strategies that reduce conflicts over ocean resources	1	2	3	4	5	NA
Defining how the ocean and its resources are used	1	2	3	4	5	NA

Here is a more general question:
How often do you attend public meetings regarding the ocean:

Never	Sometimes	Whenever I hear about them	As often as possible

Using **Scale 1** again, please answer the following statements:

You know where to find information about public meetings on ocean protection	1	2	3	4	5	NA
You are aware of developments and initiatives happening in the ocean space	1	2	3	4	5	NA
You believe that your opinion matters when it comes to deciding what happens in the coastal and ocean space	1	2	3	4	5	NA
Local knowledge is incorporated into the management of ocean space	1	2	3	4	5	NA
The Marine Spatial Plan is a good way of managing our ocean space	1	2	3	4	5	NA
It is important to you that the ocean remains healthy and productive	1	2	3	4	5	NA
Oil and gas exploration in Seychelles should be allowed	1	2	3	4	5	NA
There is adequate law enforcement in Seychelles waters	1	2	3	4	5	NA

This time we are going to use **Scale 2.** How satisfied are you with:

The management of Seychelles marine protected areas	1	2	3	4	5	NA
The management of Seychelles ocean and marine resources	1	2	3	4	5	NA

Thank you for your answers so far. Next, let's talk about fisheries management.

Fisheries management

Using **Scale 3**, how would you rate your knowledge of fisheries management in Seychelles?

Very low	Low	Neither low nor high	High	Very high

Let's go back to **Scale 1** to answer the following statements.
For you, fisheries management means:

To control the amount of fish extracted from the ocean	1	2	3	4	5	NA
To create a balance between fishing management and conservation	1	2	3	4	5	NA
To conduct surveillance on fishing activities	1	2	3	4	5	NA

Here are a few more general questions:
Which organization is responsible for implementing fisheries policies? [Ans: Seychelles Fishing Authority]
Are there any limits to the size of fish caught in Seychelles? Y/N [Ans: Y]
If Y: What is, or are, the name/s of the species? [Ans: Bourzwa and Zobgris]
Is there a limit to the number of active traps that a licensed fishing vessel can have? Y/N [Ans: Y]

Using **Scale 1** again, please indicate your answer to the following statements:

You know the local plans and policies that manage fisheries in Seychelles	1	2	3	4	5	NA
You think that fisheries reporting in Seychelles is transparent	1	2	3	4	5	NA
You want to know more about things going on in the fisheries sector	1	2	3	4	5	NA
You trust the government's management of Seychelles fisheries	1	2	3	4	5	NA
Seychelles benefits from international funding of fisheries development	1	2	3	4	5	NA
Fisheries rules are enforced in Seychelles	1	2	3	4	5	NA
There should be a minimum size limit for catching certain fish species in Seychelles	1	2	3	4	5	NA
It is important to report anyone seen killing a turtle	1	2	3	4	5	NA

This time we will use **Scale 2** to answer the statements.
How satisfied are you with:

The management of Seychelles commercial purse seine fishery?	1	2	3	4	5	NA
The management of Seychelles commercial longline fishery?	1	2	3	4	5	NA
The management of Seychelles lobster fishery?	1	2	3	4	5	NA
The management of Seychelles sea cucumber fishery?	1	2	3	4	5	NA
The management of Seychelles semi-industrial longline fishery?	1	2	3	4	5	NA
The management of Seychelles artisanal handline fishery?	1	2	3	4	5	NA
The management of Seychelles artisanal trap fishery?	1	2	3	4	5	NA
The management of Seychelles recreational fishery?	1	2	3	4	5	NA
The management of Seychelles sports fishery?	1	2	3	4	5	NA

Now we will move on to the topic of fisheries value chains.

Fisheries value chain

Using **Scale 3**, how would you rate your knowledge of fisheries value chains in Seychelles?

Very low	Low	Neither low nor high	High	Very high

Have a look at **Scale 1** to answer the next few statements.
For these statements, 'fish' means the fish or other animals caught in Seychelles fisheries.
For you, fisheries value chain means:

Creating value added services, like fish burgers, selling filleted fish, canning fish, or curios made from fish	1	2	3	4	5	NA
The people/places that I buy fish from, not the fisherman	1	2	3	4	5	NA
The export of fish	1	2	3	4	5	NA

Here are some more statements to answer using **Scale 1:**

Fisheries are only about catching fish	1	2	3	4	5	NA
There are business opportunities in fisheries value chains in Seychelles	1	2	3	4	5	NA
You know where to go if you want to develop a business related to fisheries	1	2	3	4	5	NA
It is easy for you to start a business related to fishing or fisheries	1	2	3	4	5	NA
There is enough local interest in developing different products from fish and other organisms harvested from the ocean	1	2	3	4	5	NA
There are job opportunities in fisheries value chains in Seychelles	1	2	3	4	5	NA
Youth are interested in job opportunities provided by fisheries	1	2	3	4	5	NA
International trade is important to Seychelles fishery value chain	1	2	3	4	5	NA

Now, let's use **Scale 2** again.
How satisfied are you with:

The management of Seychelles' fishery value chains?	1	2	3	4	5	NA

Let's talk a bit about a relatively new topic, aquaculture now.

Aquaculture

Using **Scale 3,** how would you rate your knowledge of aquaculture in Seychelles?

Very low	Low	Neither low nor high	High	Very high

Using **Scale 1**, please answer the following statements:
For you, aquaculture is:

Growing fish in ponds at sea	1	2	3	4	5	NA
Growing fish and other marine species on land only	1	2	3	4	5	NA
Growing fish and other marine species on land and at sea	1	2	3	4	5	NA

Do you think that Aquaculture in Seychelles is primarily for the international market? Y/N

Let's use **Scale 1** again for the following statements:

Aquaculture is needed in Seychelles	1	2	3	4	5	NA
Aquaculture will threaten small scale fishers' livelihoods	1	2	3	4	5	NA
Having aquaculture in Seychelles will put less pressure on our fish stocks	1	2	3	4	5	NA
Aquaculture has a negative impact on the environment	1	2	3	4	5	NA
There are enough opportunities in aquaculture for women	1	2	3	4	5	NA
There needs to be more education and awareness about aquaculture	1	2	3	4	5	NA
People need a university degree to work in aquaculture	1	2	3	4	5	NA
You would eat fish grown in aquaculture	1	2	3	4	5	NA

We're going to use **Scale 2** to answer the next statement:
How satisfied are you with:

The management of Seychelles aquaculture?	1	2	3	4	5	NA

We are close to finished now. Let's talk about the Blue Economy.

Blue Economy

Using **Scale 3,** how would you rate your knowledge of the Blue Economy in Seychelles?

Very low	Low	Neither low nor high	High	Very high

Please use **Scale 1** to answer the next statements:

To me, the blue economy means:

The sustainable management of ocean resources	1	2	3	4	5	NA
The planning of ocean resource use to benefit current and future generations	1	2	3	4	5	NA
The use of ocean resources for maximizing economic gain of the Seychelles	1	2	3	4	5	NA

Again, using **Scale 1,** please answer the following statements:

You think the blue economy is a vague concept	1	2	3	4	5	NA
The blue economy is relevant to you	1	2	3	4	5	NA
It is easy to get a job in the blue economy	1	2	3	4	5	NA
You know how to access information on the blue economy	1	2	3	4	5	NA
The blue economy is about creating sustainable wealth	1	2	3	4	5	NA
The blue economy promotes healthy lifestyles	1	2	3	4	5	NA
The blue economy has improved the business environment in Seychelles	1	2	3	4	5	NA
The blue economy promotes protection of marine and coastal resources	1	2	3	4	5	NA

Now I'm going to ask you a few questions about yourself.

Socio-demographic questions

On which island do you live?	Mahé	Praslin	La Digue	Other
In which district?	List all districts	See District List		
What age bracket do you fall into?	18-24	25-30	31-44	
	45-54	55-64	>65	
Tell me about your schooling. Have you had:	No schooling	Primary 1- 6	Secondary / P7 – P9, Form 1 – 3, NYS	
	Post-Secondary	Technical training/diploma College (Regina Mundi/Seychelles college/ Covent/ Teacher Training college), Polytechnic, Technical School	University	
What is your profession?				
How do you use the beach and ocean in your free time?	I don't use it	For my livelihood	For recreation	
	For relaxation	Other:		
What gender are you, or do you identify as?	Male	Female	Other	Rather not say

Enumerator: capture this automatically without asking:

Sex of the respondent	Male	Female	Unsure

General comments

Lastly, do you have any comments you would like to make?

Closing

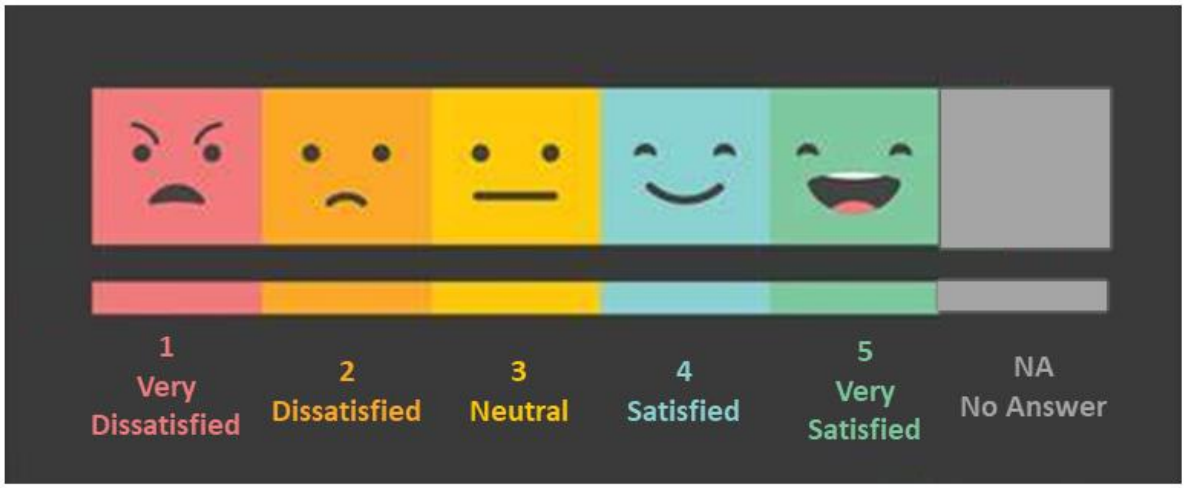
Thank you very much for your time. I appreciate it. Your information will remain confidential and your responses will contribute greatly to this project. Have a great day.

Appendix 2: Respondent response sheet

Response Sheet

Scale 1

Scale 2

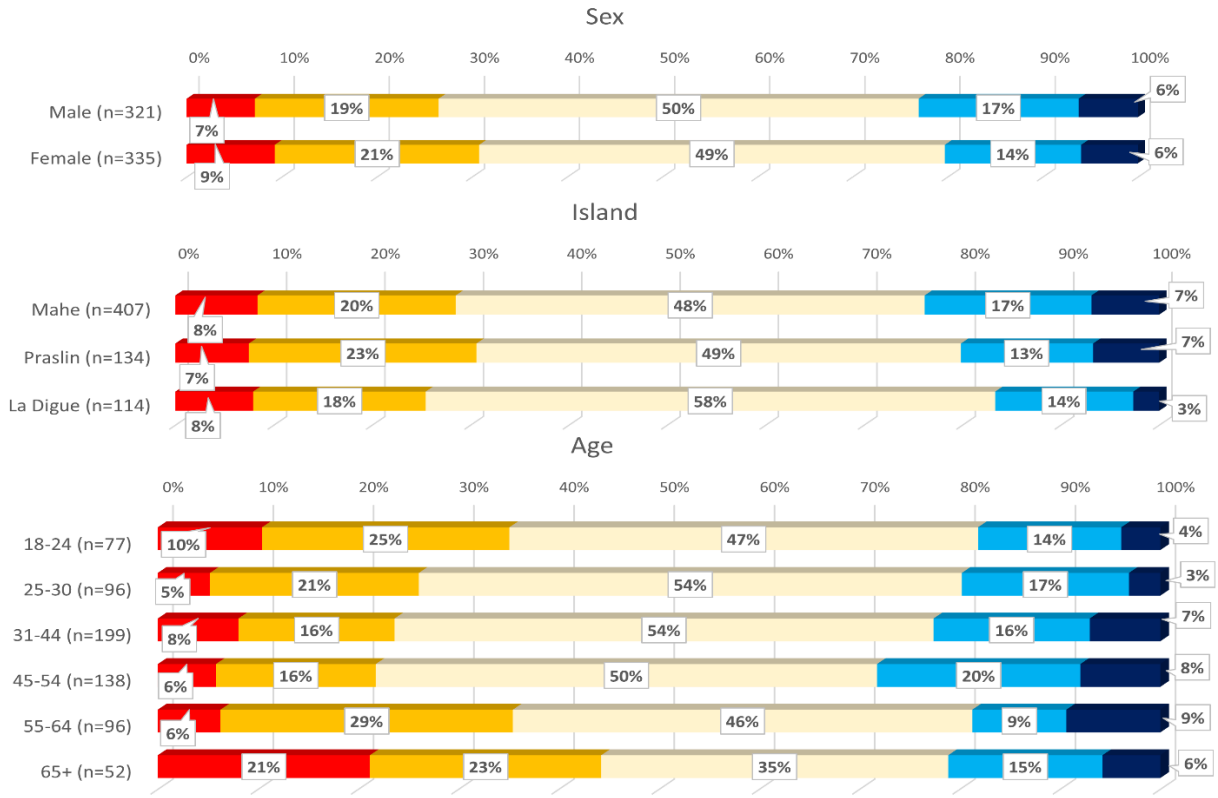


Scale 3

Very low	1
Low	2
Neither low nor high / neutral	3
High	4
Very high	5
No Answer	NA

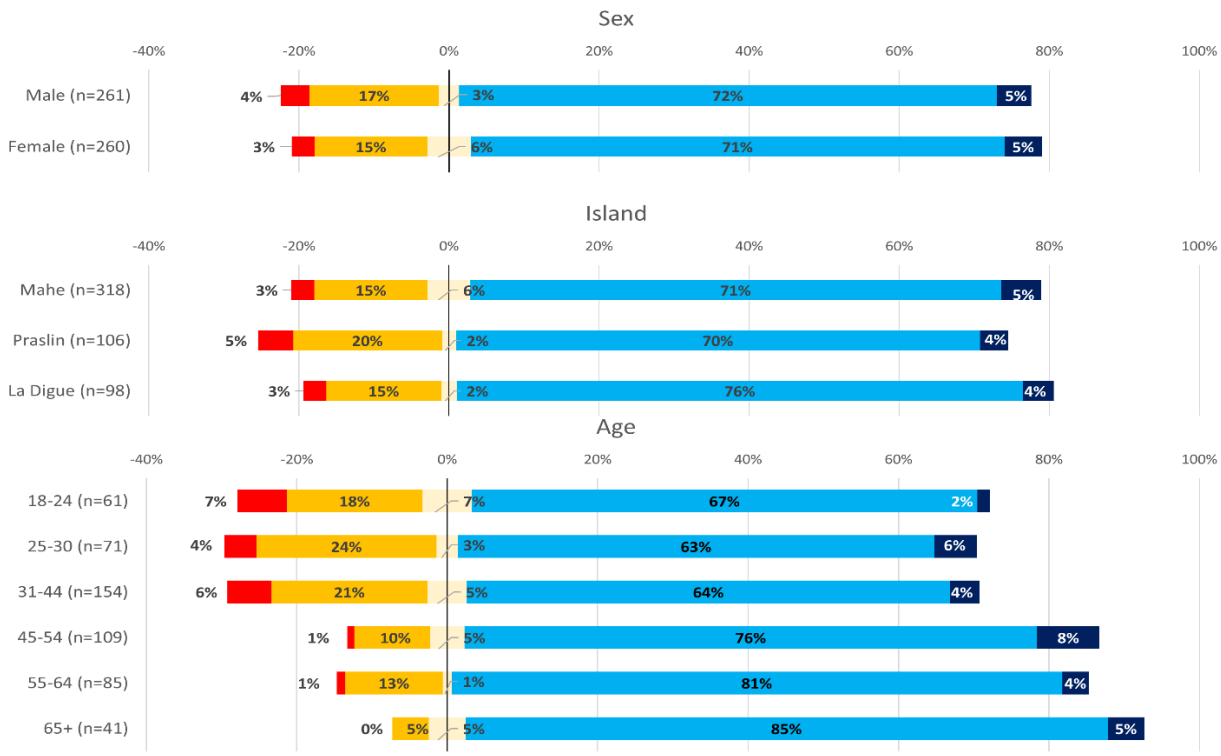
Appendix 3: Supplementary graphs

Ocean management



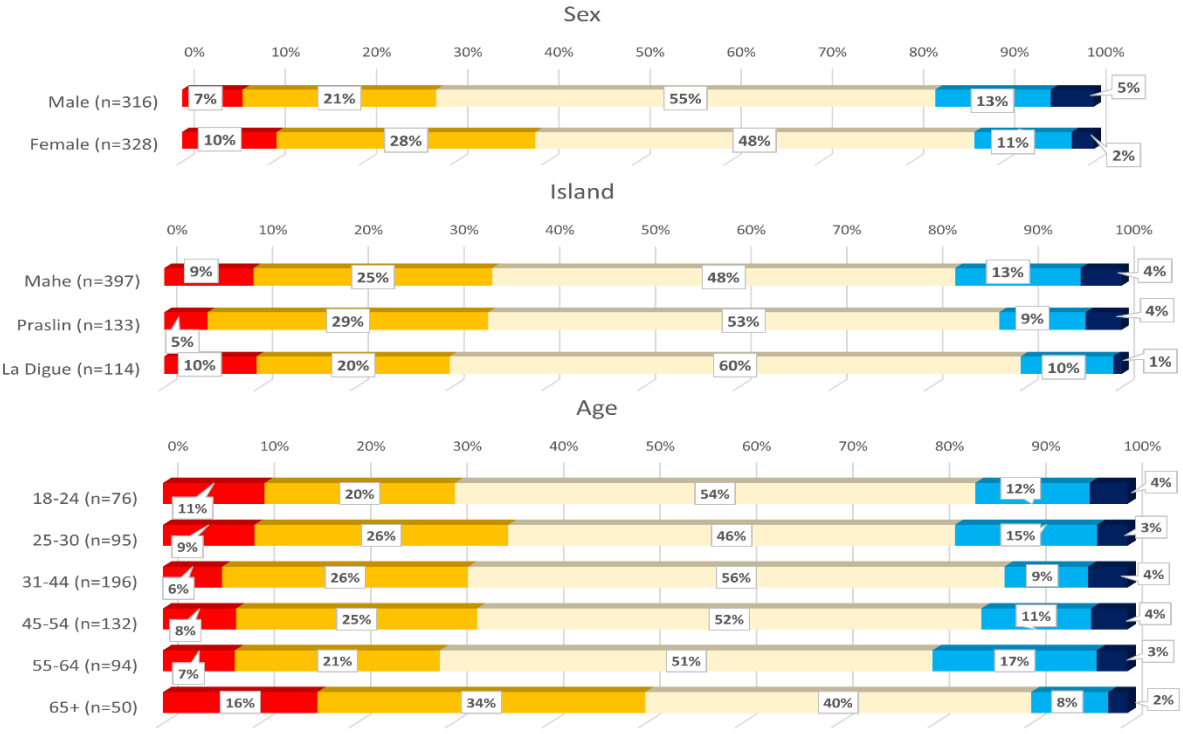
Seychellois Ocean Management knowledge, by sex, island and age

Seychellois satisfaction with the management of marine protected areas, by sex, island and age

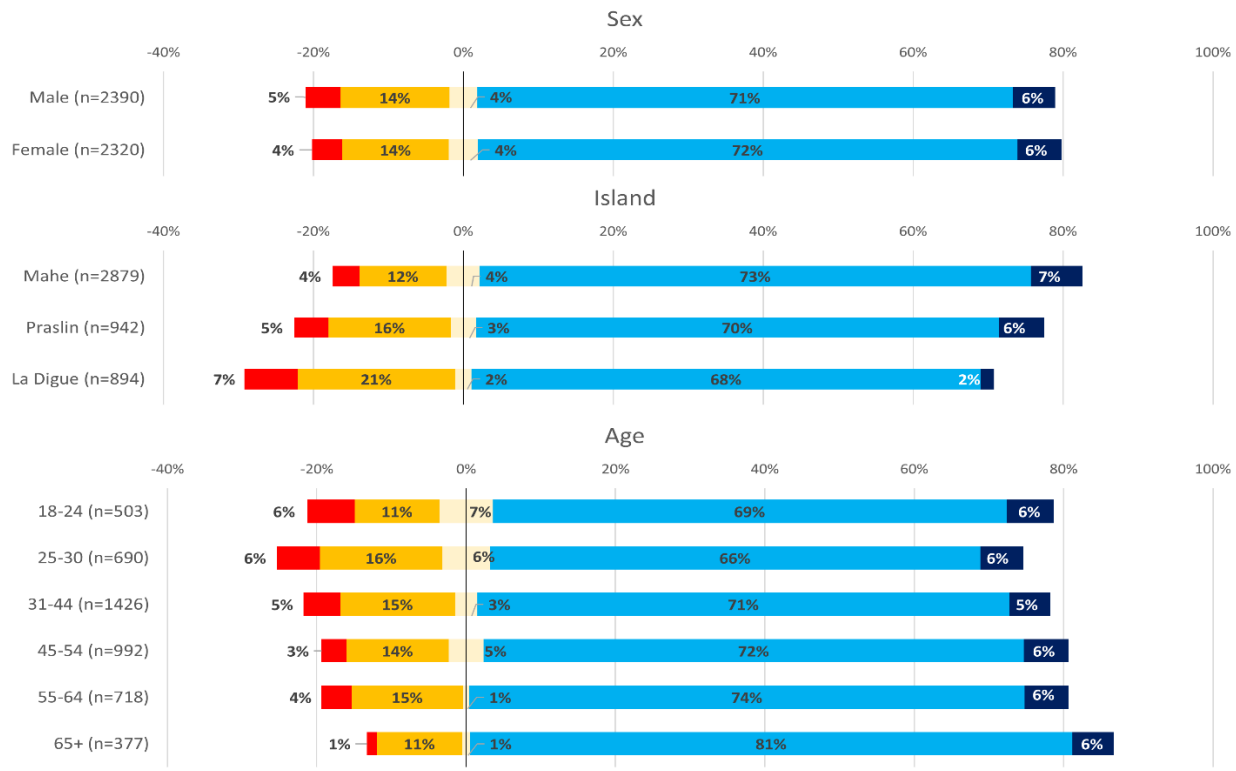


Seychellois satisfaction with the management of Seychelles' ocean and marine resources, by sex, island and age

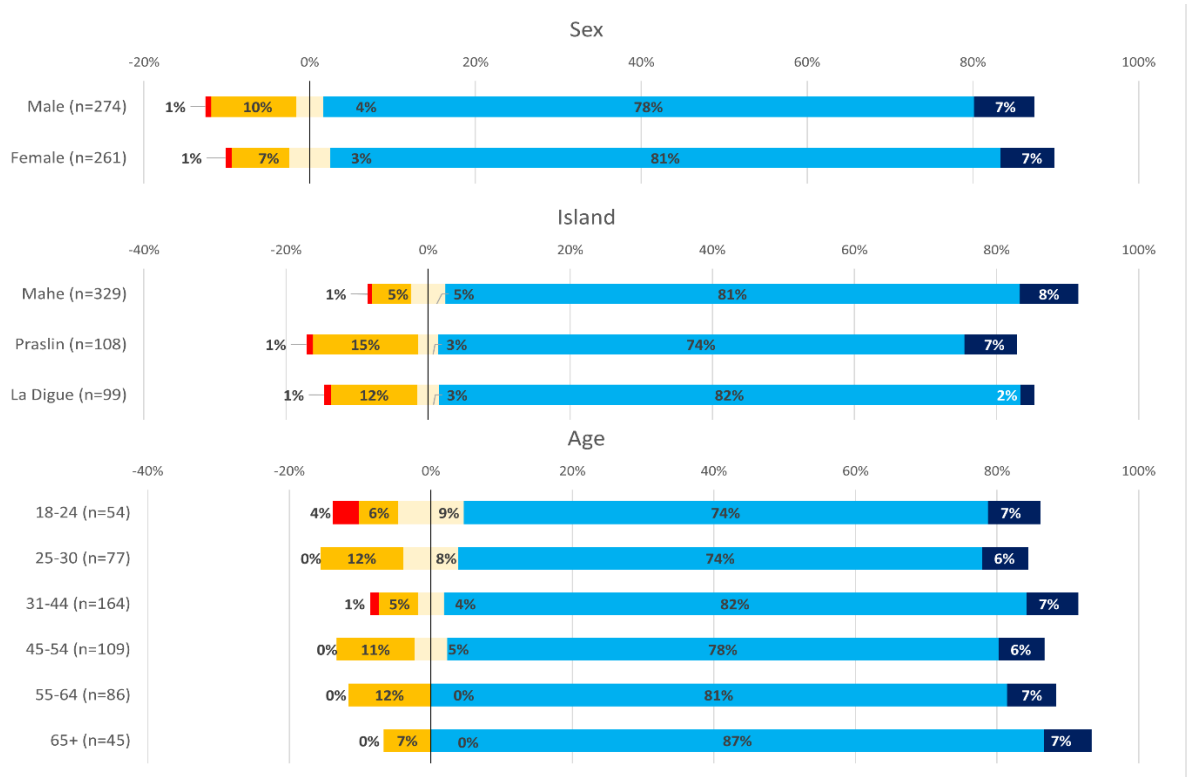
Fisheries management



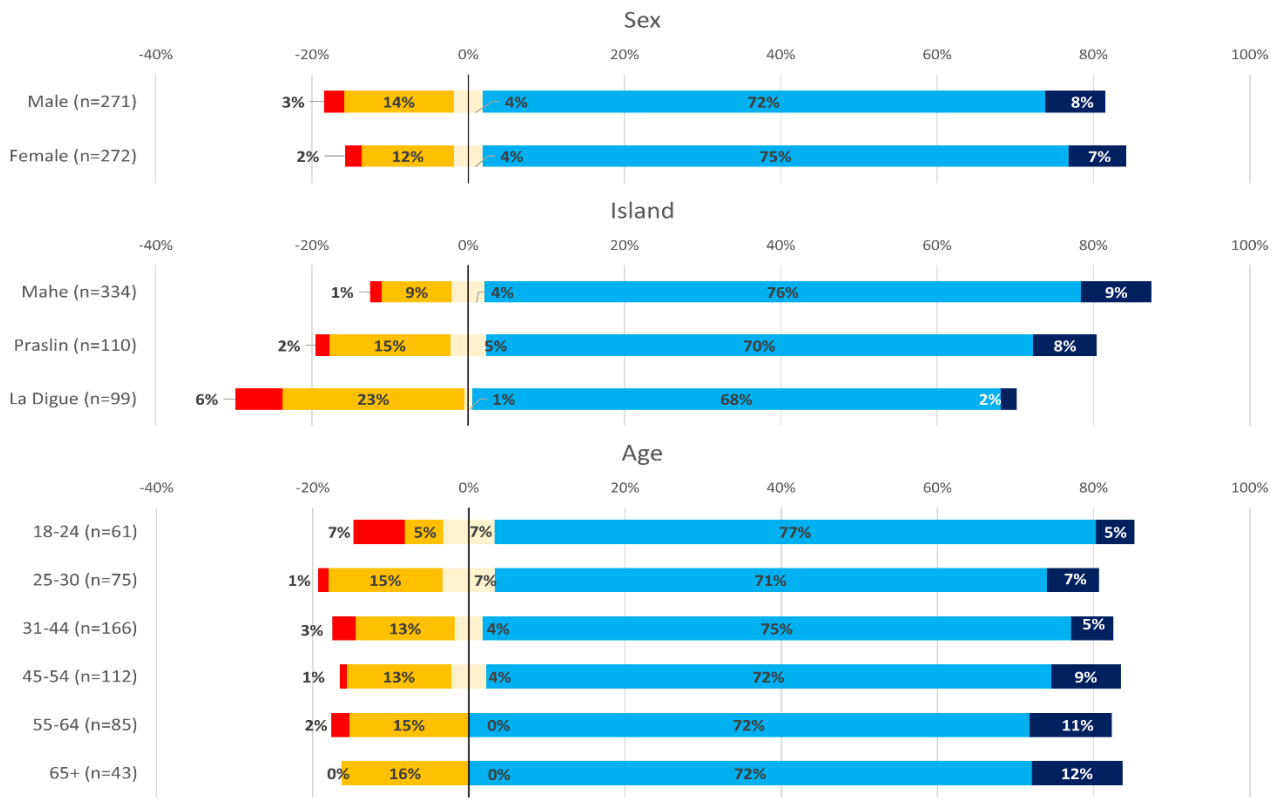
Seychellois knowledge of Fisheries Management, by sex, island and age



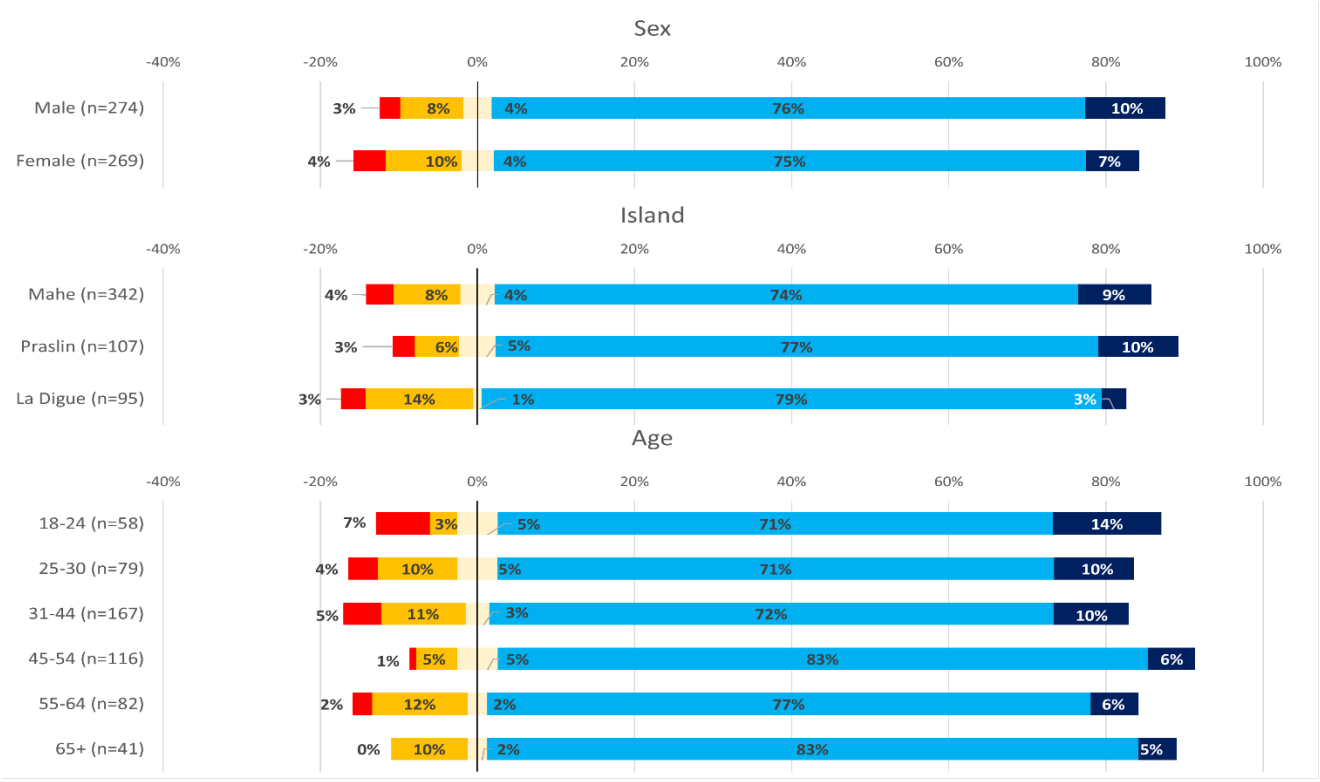
Graph showing Seychellois level of satisfactions with the management of Seychelles' fisheries



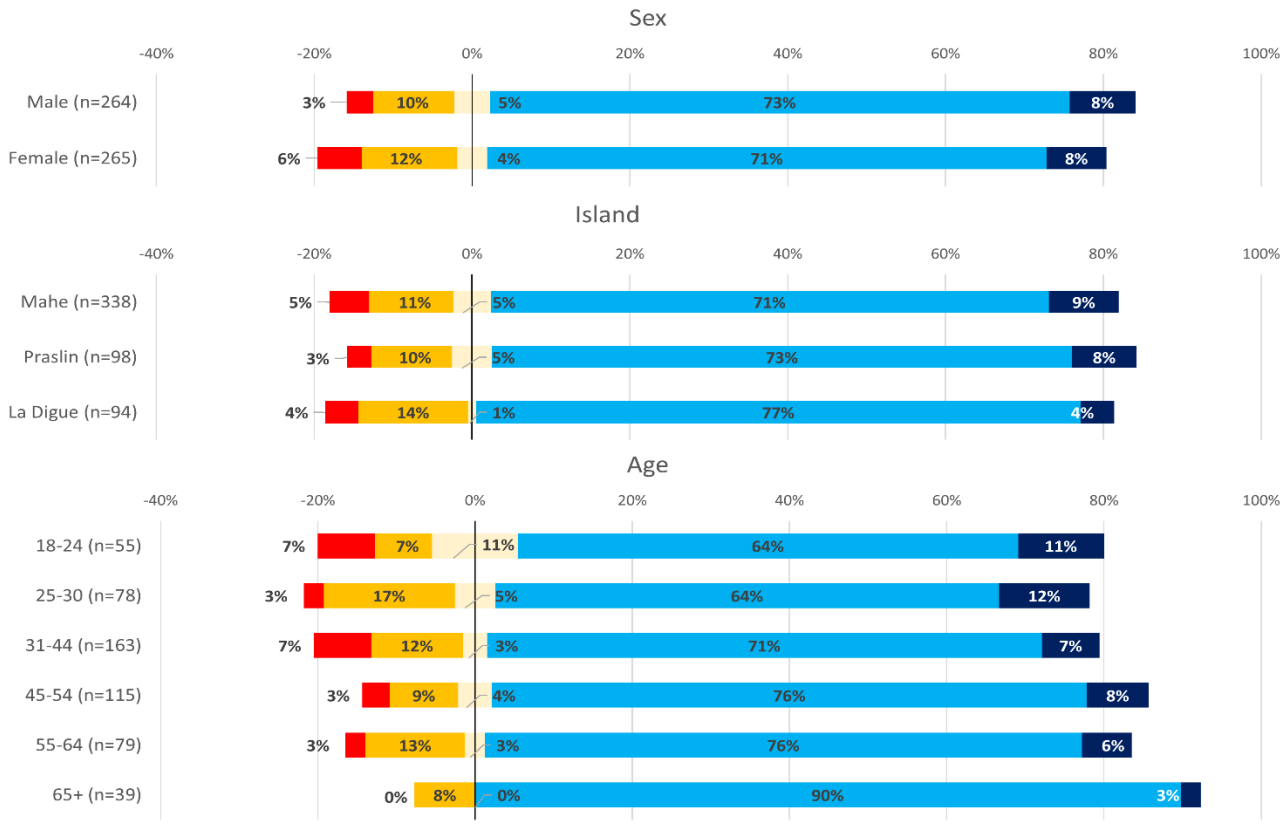
Seychellois level of satisfactions with the management of Seychelles' artisanal handline fishery



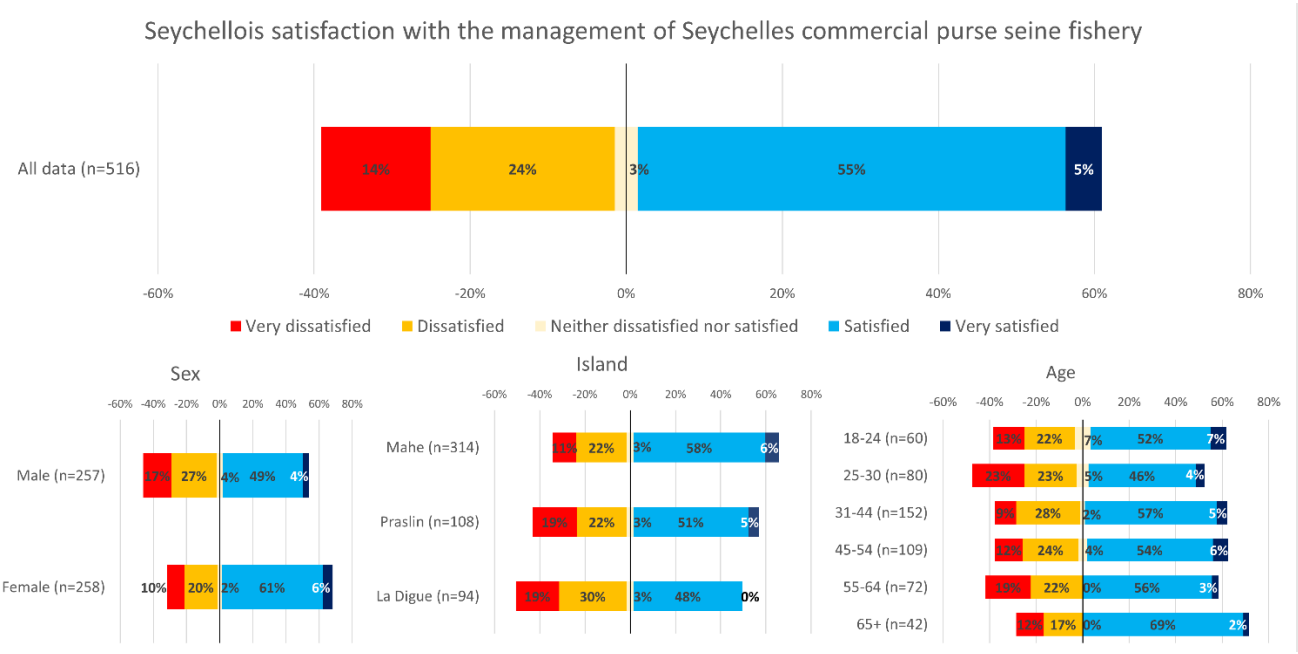
Seychellois level of satisfactions with the management of Seychelles' artisanal handline fishery

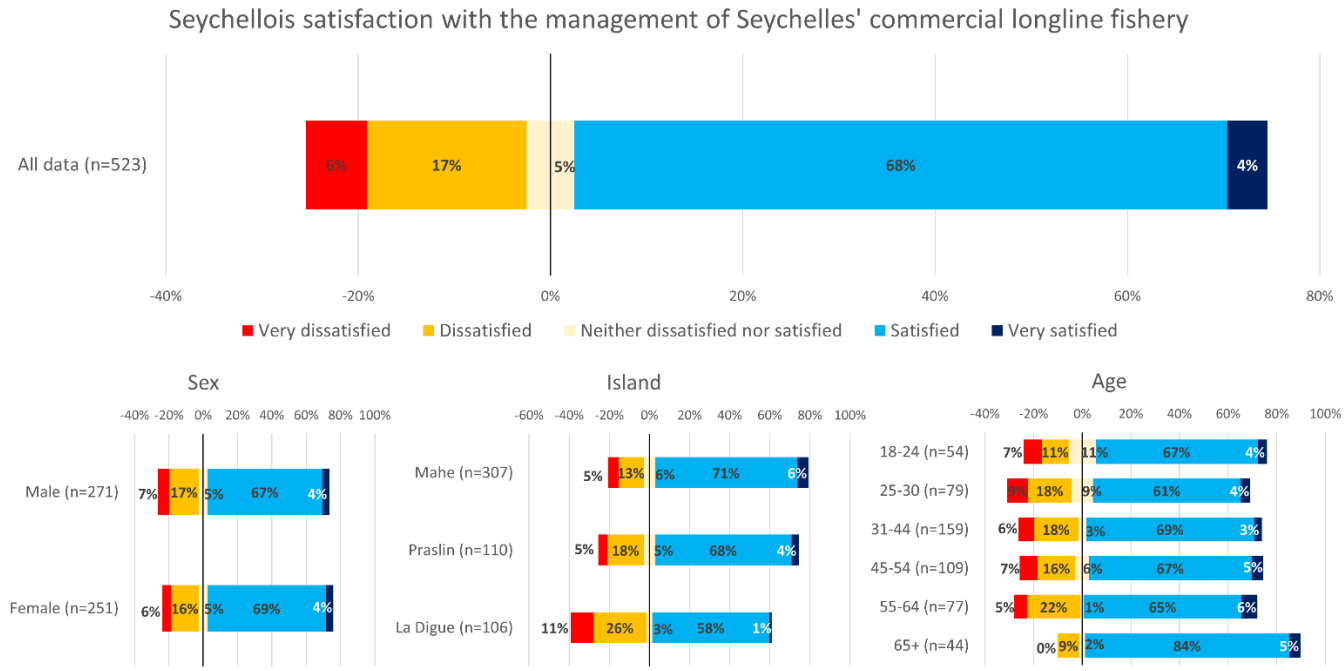


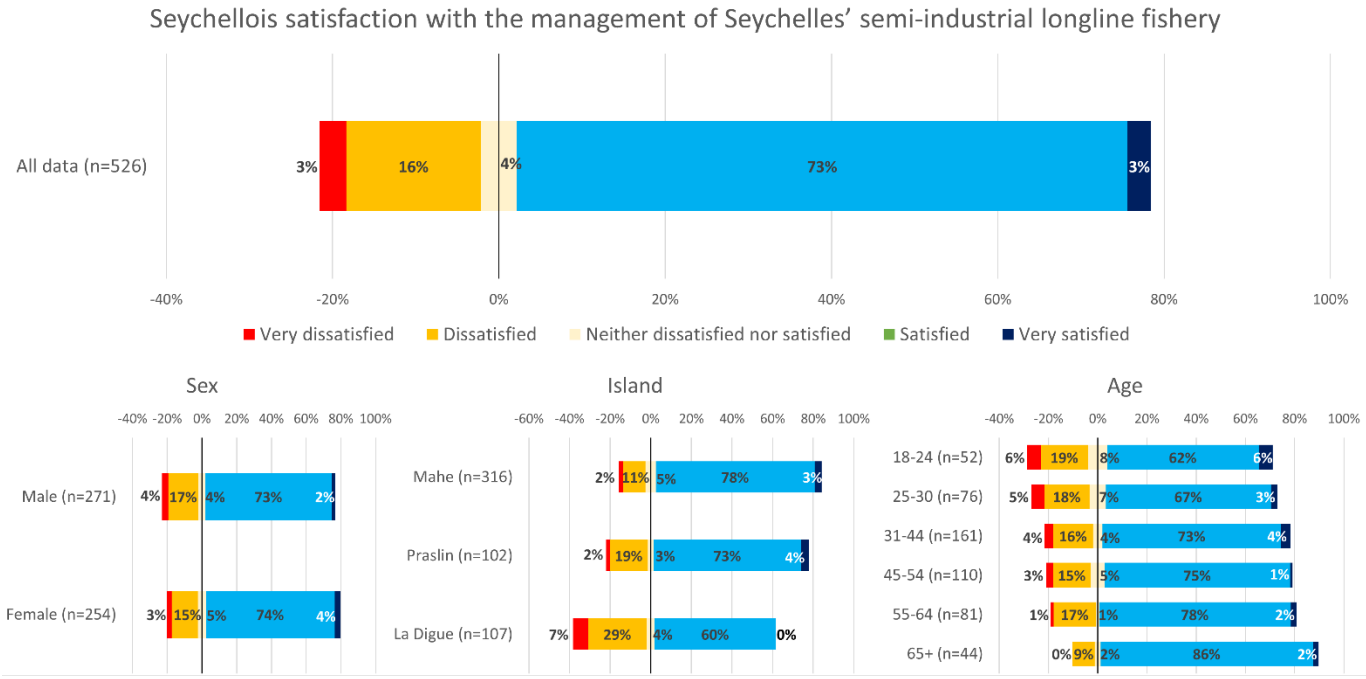
Seychellois level of satisfactions with the management of Seychelles' recreational fishery

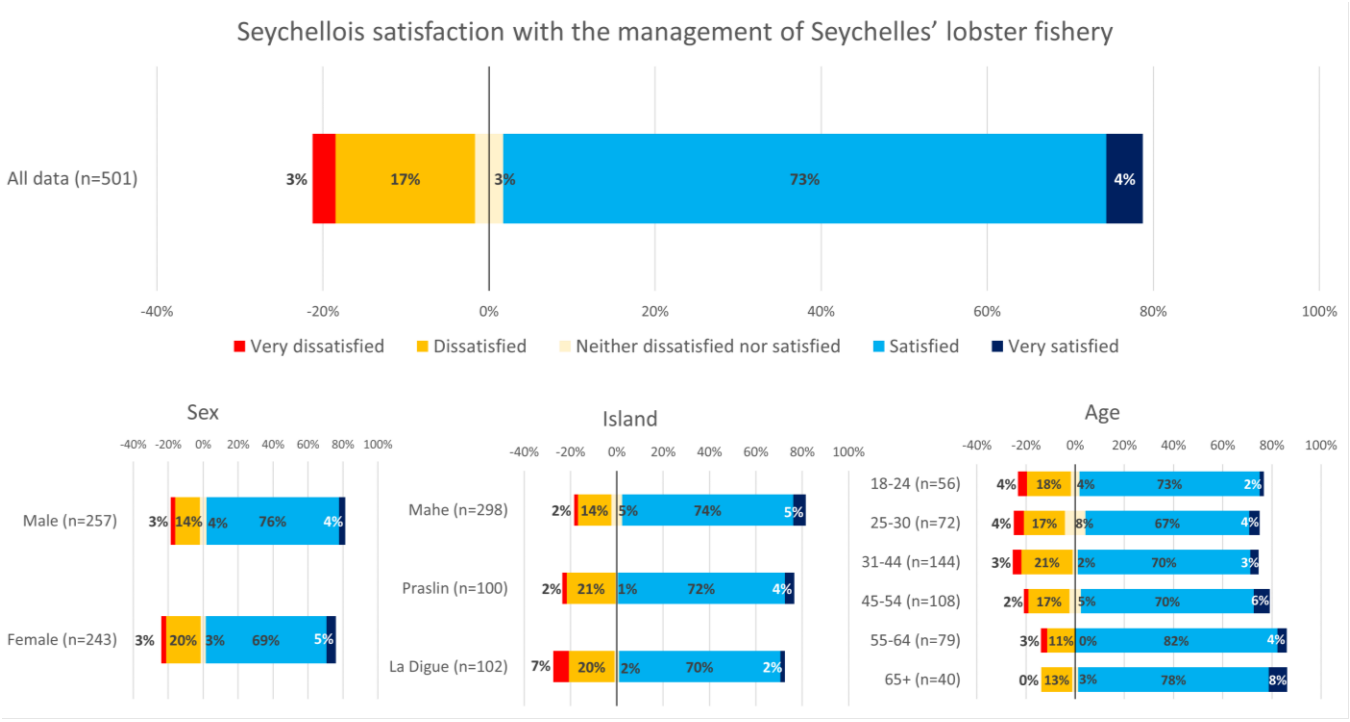


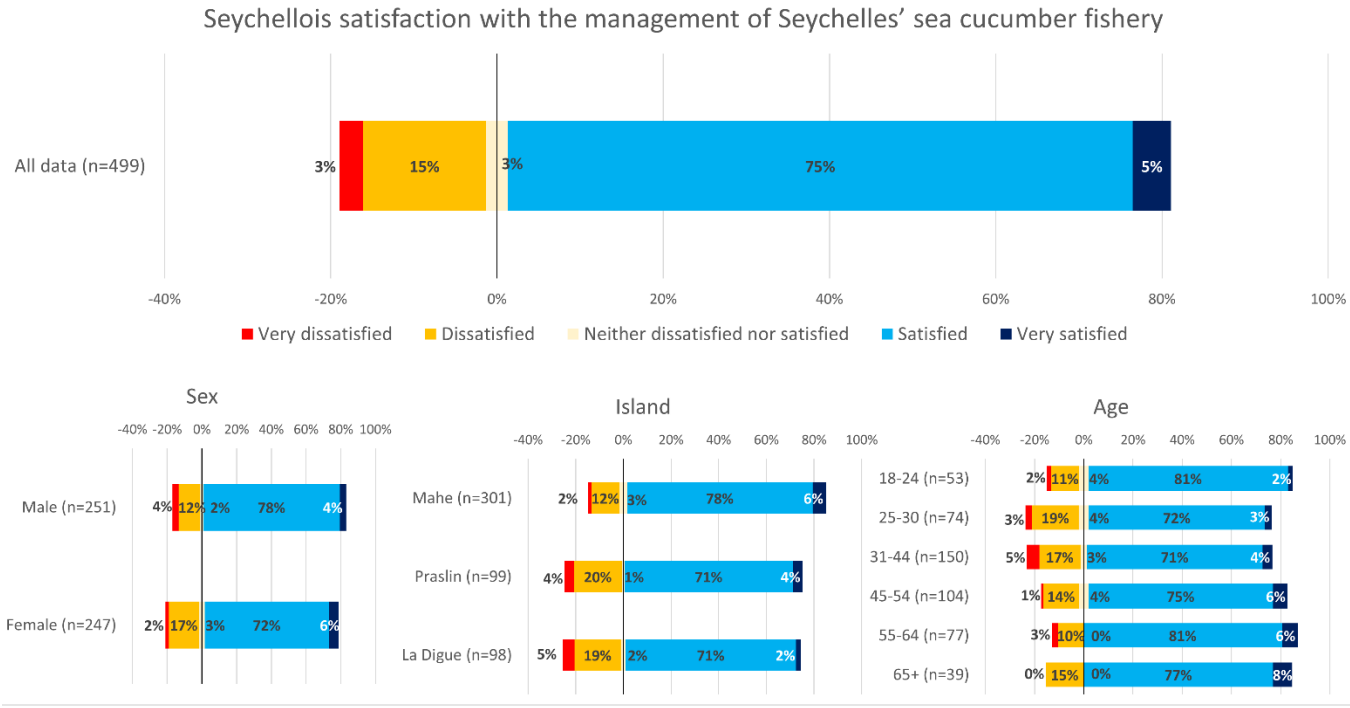
Seychellois level of satisfactions with the management of Seychelles' sports fishery



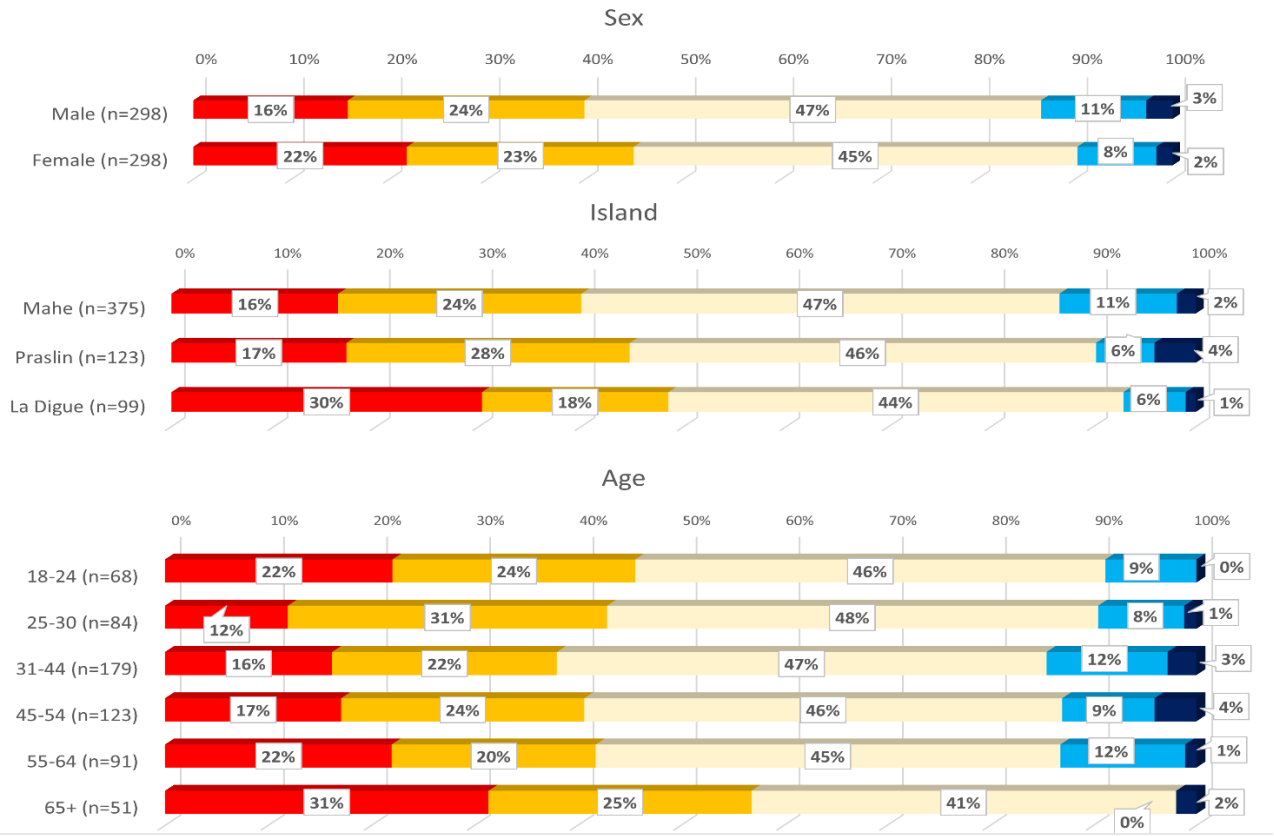

Seychellois satisfaction with the management of Seychelles' commercial longline fishery
All data (n=523)
6%
17%
5%
68%
4%
-40%
-20%
0%
20%
40%
60%
80%
Very dissatisfied
Dissatisfied
Neither dissatisfied nor satisfied
Satisfied
Very satisfied
Sex
Male (n=271)
7%
17%
5%
67%
4%
Female (n=251)
6%
16%
5%
69%
4%
Island
Mahe (n=307)
5%
13%
6%
71%
6%
Praslin (n=110)
5%
18%
5%
68%
4%
La Digue (n=106)
11%
26%
3%
58%
1%
Age
18-24 (n=54)
7%
11%
11%
67%
4%
25-30 (n=79)
9%
18%
9%
61%
4%
31-44 (n=159)
6%
18%
3%
69%
3%
45-54 (n=109)
7%
16%
6%
67%
5%
55-64 (n=77)
5%
22%
1%
65%
6%
65+ (n=44)
0%
9%
2%
84%
5%


Seychellois satisfaction with the management of Seychelles' semi-industrial longline fishery
All data (n=526)
3%
16%
4%
73%
3%
-40%
-20%
0%
20%
40%
60%
80%
100%
Very dissatisfied
Dissatisfied
Neither dissatisfied nor satisfied
Satisfied
Very satisfied
Sex
Male (n=271)
4%
17%
4%
73%
2%
Female (n=254)
3%
15%
5%
74%
4%
Island
Mahe (n=316)
2%
11%
5%
78%
3%
Praslin (n=102)
2%
19%
3%
73%
4%
La Digue (n=107)
7%
29%
4%
60%
0%
Age
18-24 (n=52)
6%
19%
8%
62%
6%
25-30 (n=76)
5%
18%
7%
67%
3%
31-44 (n=161)
4%
16%
4%
73%
4%
45-54 (n=110)
3%
15%
5%
75%
1%
55-64 (n=81)
1%
17%
1%
78%
2%
65+ (n=44)
0%
9%
2%
86%
2%

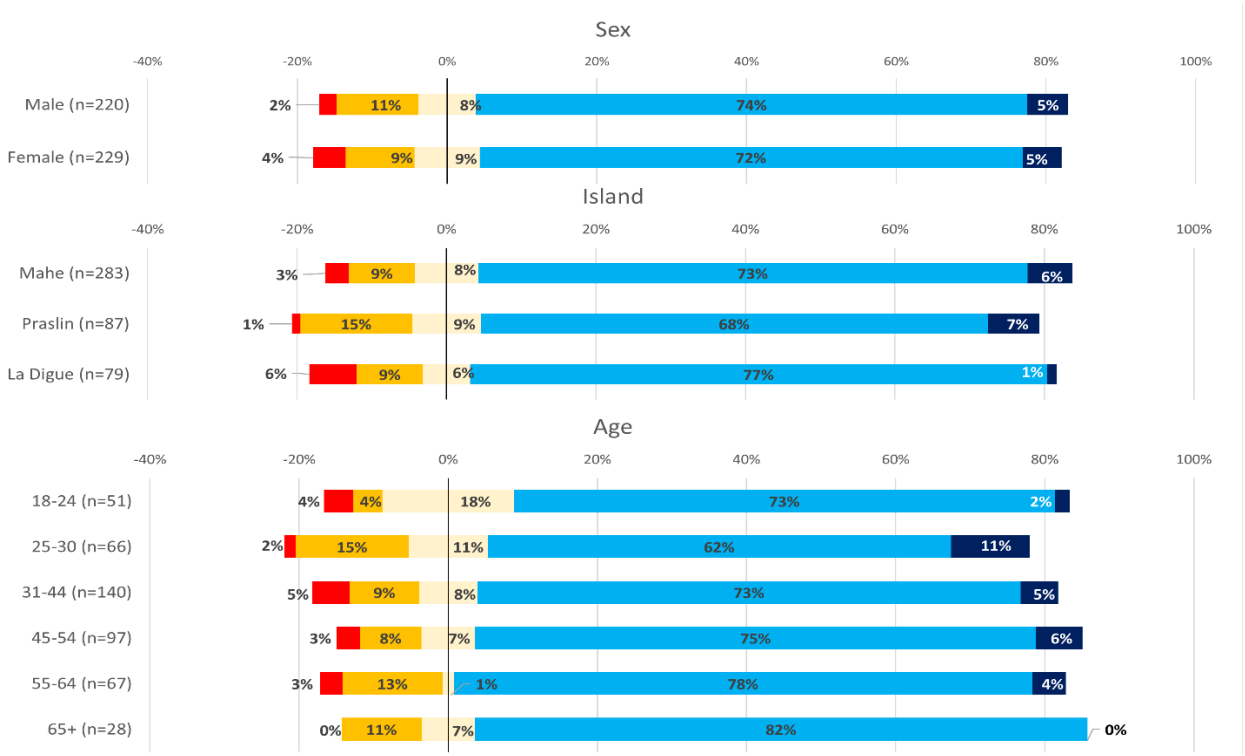

Seychellois satisfaction with the management of Seychelles' lobster fishery
All data (n=501)
3%
17%
3%
73%
4%
-40%
-20%
0%
20%
40%
60%
80%
100%
Very dissatisfied
Dissatisfied
Neither dissatisfied nor satisfied
Satisfied
Very satisfied
Sex
Male (n=257)
3%
14%
4%
76%
4%
Female (n=243)
3%
20%
3%
69%
5%
Island
Mahe (n=298)
2%
14%
5%
74%
5%
Praslin (n=100)
2%
21%
1%
72%
4%
La Digue (n=102)
7%
20%
2%
70%
2%
Age
18-24 (n=56)
4%
18%
4%
73%
2%
25-30 (n=72)
4%
17%
8%
67%
4%
31-44 (n=144)
3%
21%
2%
70%
3%
45-54 (n=108)
2%
17%
5%
70%
6%
55-64 (n=79)
3%
11%
0%
82%
4%
65+ (n=40)
0%
13%
3%
78%
8%


Seychellois satisfaction with the management of Seychelles' sea cucumber fishery
All data (n=499)
3%
15%
3%
75%
5%
-40%
-20%
0%
20%
40%
60%
80%
100%
Very dissatisfied
Dissatisfied
Neither dissatisfied nor satisfied
Satisfied
Very satisfied
Sex
Male (n=251)
4%
12%
2%
78%
4%
Female (n=247)
2%
17%
3%
72%
6%
Island
Mahe (n=301)
2%
12%
3%
78%
6%
Praslin (n=99)
4%
20%
1%
71%
4%
La Digue (n=98)
5%
19%
2%
71%
2%
Age
18-24 (n=53)
2%
11%
4%
81%
2%
25-30 (n=74)
3%
19%
4%
72%
3%
31-44 (n=150)
5%
17%
3%
71%
4%
45-54 (n=104)
1%
14%
4%
75%
6%
55-64 (n=77)
3%
10%
0%
81%
6%
65+ (n=39)
0%
15%
0%
77%
8%

Fisheries value chain

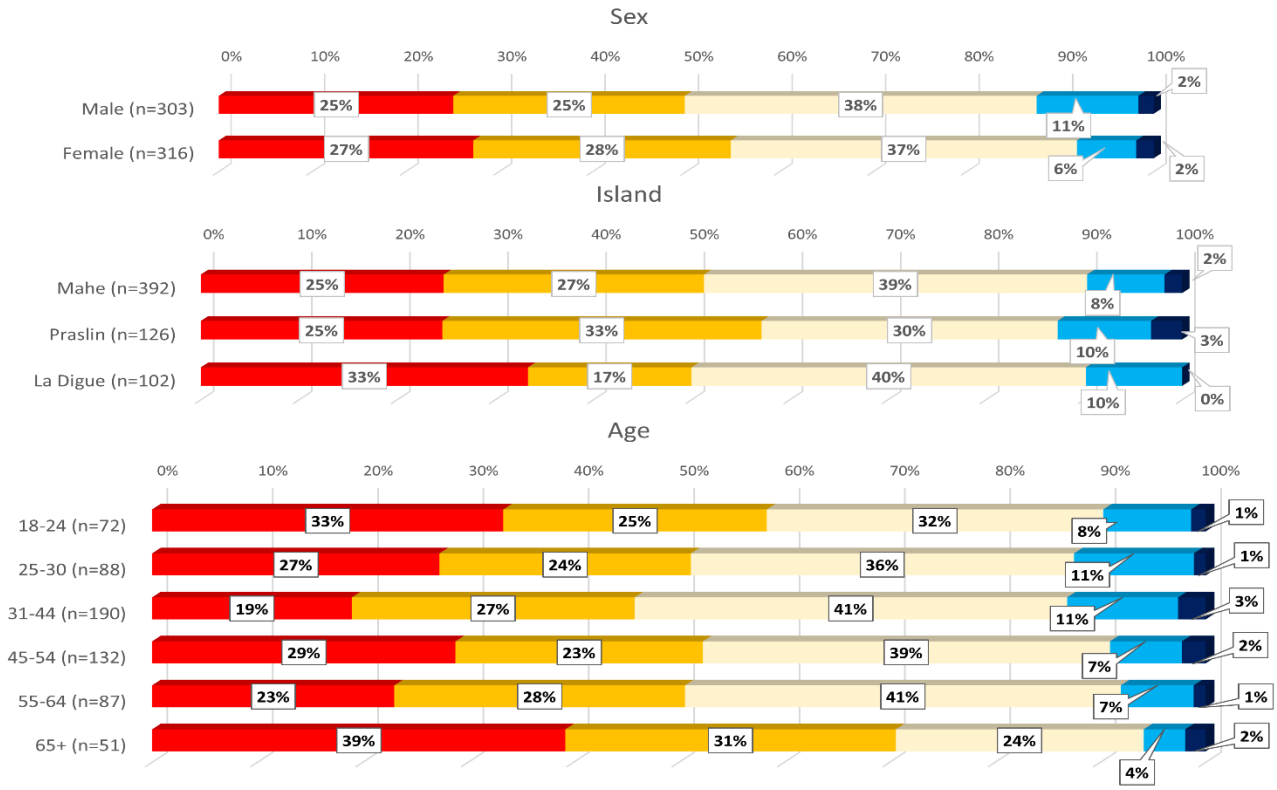


Graphs showing respondents knowledge of Seychelles fisheries value chain, by sex, island and age

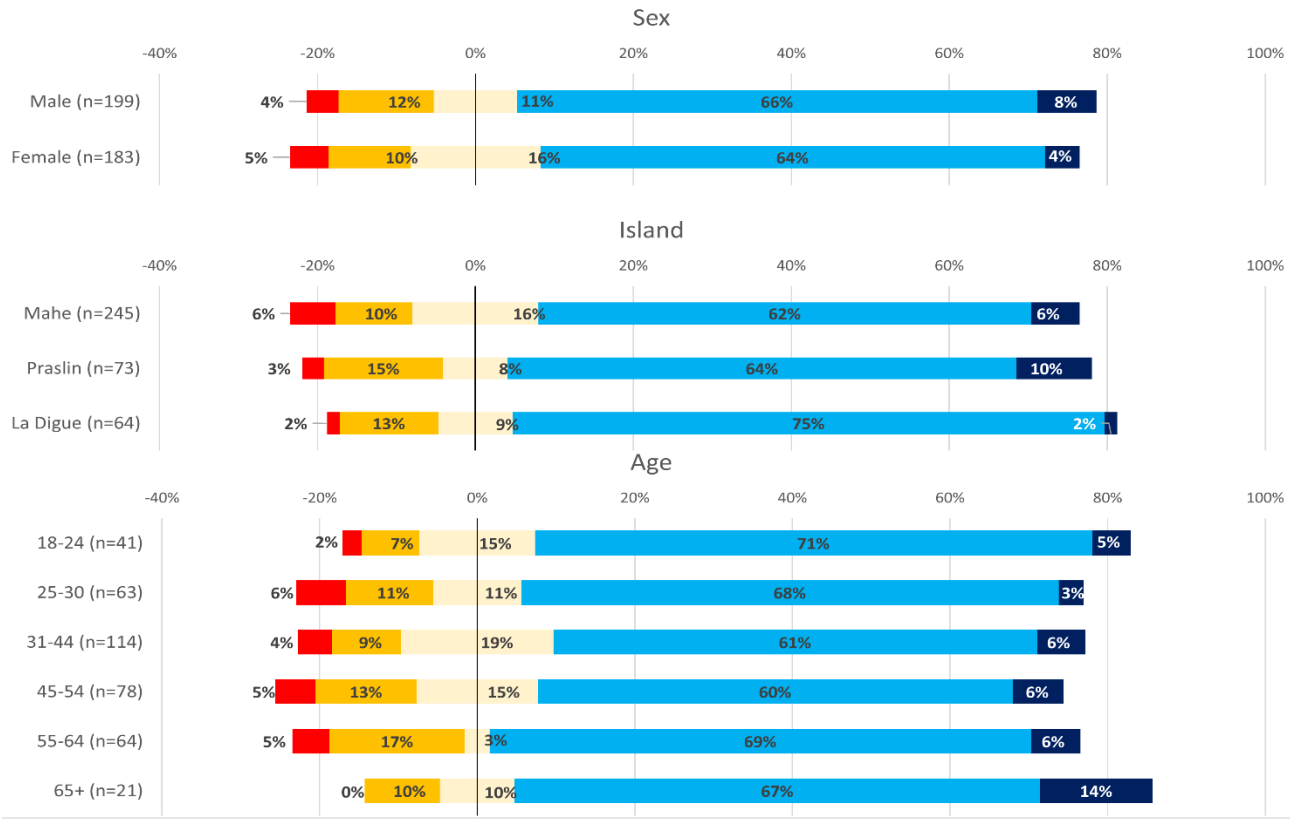


Graphs showing respondents satisfaction with fisheries value chain, by sex, island and age

Aquaculture

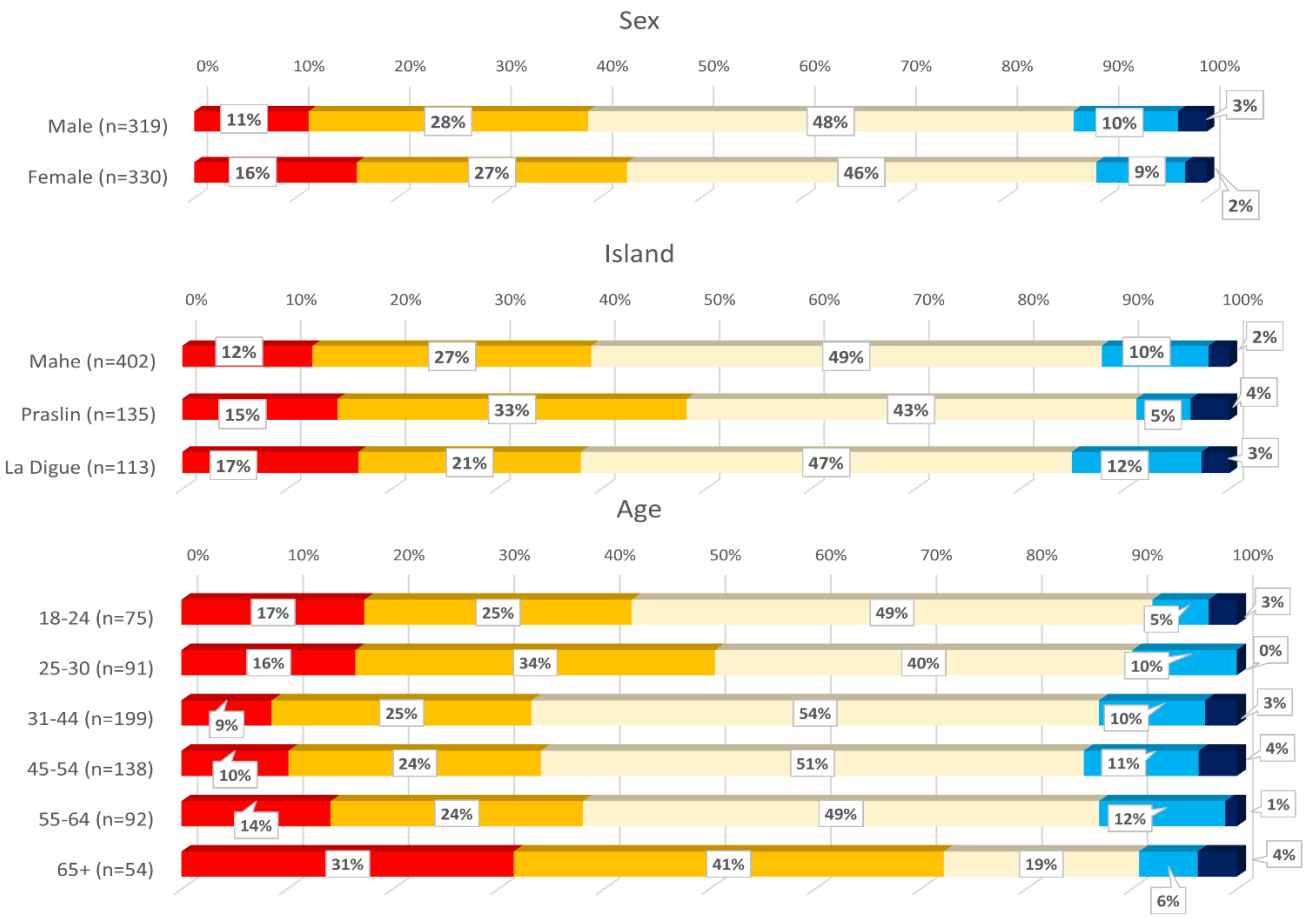


Seychellois knowledge of aquaculture by sex, island and age.



Seychellois satisfaction with the management of aquaculture by sex, island and age

Blue Economy



Respondent knowledge of the Blue Economy by sex, island and age

Appendix 4: Comments from respondents

End of survey comments by respondents, by survey theme and respondent issue

Ocean Governance

Regulation

Need more security and policy for enforcement of law protection on Sea

No implementation or enforcement. EEZ too large. No resources to implement

Fisheries Management

Development

Encourage the youth to go into the fisheries sector. Ensure that there are variety of fish species in the sea.

Seychelles need their own fishing vessel

Economics

Fishermen feels that they are losing more money than they are making in the sector. They feel that this is due to being taken advantage from the European Union

Unsure the income from Seychelles' fisheries remain towards the Seychellois, rather the foreigners/international.

Information

To educate the youth on the development around fisheries for them to gain an interest

Regulation

I encourage people to stop turtle killing

I wish more surveillance to be done on the foreigners boat fishing in Seychelles waters.

I would like minister for Fisheries should control the amount of foreign fishing boat that comes fishing in our ocean space.

It’s difficult to know the size of fish before fishing it and releasing fish that’s going to die is going to be more destructive.

Limit on vessels not on fish traps. More value added products like burger and fillet on La Digue.

Need to put more protection on tuna, and the way tuna fishing vessels are being managed. Seychelles needs to invest more in fishing vessels rather than renting fishing authorisation to other countries

Sea turtle control

Should control seriously the size limit of fish caught

To control exploitation of foreign vessel in our sea, there should be more enforcement on foreign vessel

Tuna fishing vessels are destroying everything in it's net, but government is attacking only the smaller fishing vessels.

Tuna fishing vessels destroy all of our marine resources, because it bring lot of money government don't take action against it but accused the local fishermen instead.

Turtle is what god has given us, we will use it, regulation to eat turtles, a limit

People want to eat tortoises, needs a system for the control of killing tortoise - but still allow them to be killed.

Give us a chance to eat turtles at least to have open and closed season

Limit the number of boats not active traps on boats. Cancel/control bottom long-line for artisanal vessels. Fillet and burger should be sold also on La Digue

Fisheries Value Chain

Development

Young people should get funding for developing project in Fisheries Value Chain

Information

More information and awareness especially on Fisheries Value Chain

Aquaculture

Information

Aquaculture should not be done in Seychelles. They should focus on enforcing fisheries regulation on limit on size of fish that are caught to ensure we have fish for the future instead of focusing and investing in Aquaculture. Aquaculture could bring diseases

Aquaculture will damage the environment.

Government should do more in regards of knowledge Aquaculture

Happy to get new information on Blue Economy and Aquaculture.

Need to learn more about Aquaculture

We should promote Aquaculture, we never know the changes awaits in the future.

Blue Economy

Information

Blue Economy

Blue Economy focuses more on Mahe and there's not much that is done on La Digue

Blue Economy is for Mahe mainly.

Conduct program on Blue Economy

Degree of knowledge on Blue Economy is low

Finds it good that there is more information on Blue Economy

La Digue is not associated to Blue Economy cause everything is on Mahe

More awareness needs to be done about Blue Economy concept

More awareness on Blue Economy and Aquaculture in Seychelles

More awareness on Blue Economy and Aquaculture, they always say they will come to Praslin for awareness but they never do.

More education in schools (especially Blue Economy), promote more the following topic

More information for people to know about Blue Economy, Fisheries, Value Chains

Need to have more awareness on Blue Economy

There are not enough information on Blue Economy and a lot of money is lost on projects. There are not enough law enforcement to protect and patrol our EEZ. There's a lack of programs with the youth. Public are not informed on regulations.

Needs to put more awareness on Blue Economy.

Need more information about Blue Economy

Regulation

I would love if Blue Economy would target those people conducting overfishing leading to wastage.

Communication

General

Good initiative

Questionnaire long take too much peoples time

Questionnaire too long, Questions repeatedly and stupid

Survey is important. It helps to take decision based on evidence of public opinion

The question doesn't make sense, questions pop up more than once. It's too long, the questions are not user friendly, they are not straight forward, and lastly, we cannot eat turtles while the authorities can behind closed doors

Information

Awareness is lacking. Primary schools lacking awareness

Compile the answer and work to continue a great work

For them to consider local opinion. More often they listen to the opinion of people who give funds and not locals

Give more information. Simple information that all level of people can understand not university people. Recreational fishers should not need a license to fish like they intend to introduce. Some people fish to feed not for financial gain. License should remain for actual fishers. Due to low fish stock they should not charge fishers more and more on fish traps as this cause stress in efforts required to fish

I only know information on advertisement on media, I will appreciate if they can do it every week. Put it more on TV.

I would recommend that these surveys not be conducted on Sundays when people are using this time to relax.

Inform us on the development of the survey in the Nation newspaper/news

More awareness. Lack of knowledge

More should be done to inform people. They rather inform people after things are done but not prior. Information are given and people cannot do anything about it.

Raise awareness

General

Access

I would enjoy the beach but has no one to bring me

Development

More young people to get involved

Economics

More accountability of the money being made.

Facilities

Beach should have wheelchair access, people like me does not get much access to the beach area.

Must put bins in public beach and toilet, need to clean the beaches

General

A lot of species are becoming extinct.

I feel like the targeted group should be fisherman

I'm praying when you will end the survey with me

Keep on make the economy grow

More to be done

Tour guide

Very interesting

Our fishermen need to stop littering in the ocean.

Information

Awareness

Awareness

Awareness and education

Do more. Target the upper class

Educate people on environment laws

I think it's important to sensitize public on their role to play on the environment

Its very interesting

Local need more awareness

More awareness

More awareness in fun activities to influence youth to join in.

More information

More information, raise awareness

More knowledge

More opportunities in the Blue Economy needed

Need more information on Blue Economy on media

Raise awareness

Raise awareness on the mentioned topics so that people would be aware of it.

The Blue Economy section is interesting to me

To improve the work being done for our ocean. More needs to be done to preserve our ocean for the future generation.

Regulation

Control littering, more promotion on waste management

I wish that we continue to protect our environment, especially the ones in higher position to also contribute towards protecting the environment.

More action should be taken with people littering on the beach, maybe we should increase security on the beach.

More needs to be done to actually conserve the environment rather than focusing only on the grants and donations, a lot of conservation is done only for funds rather than for the environment itself.

Reduce ocean pollution.

Try to stop pollution.

Would love to protect our environment

Protect marine park, trash in the ocean, turtle and dolphin deaths

Appendix 5: Factors for consideration in a communication strategy

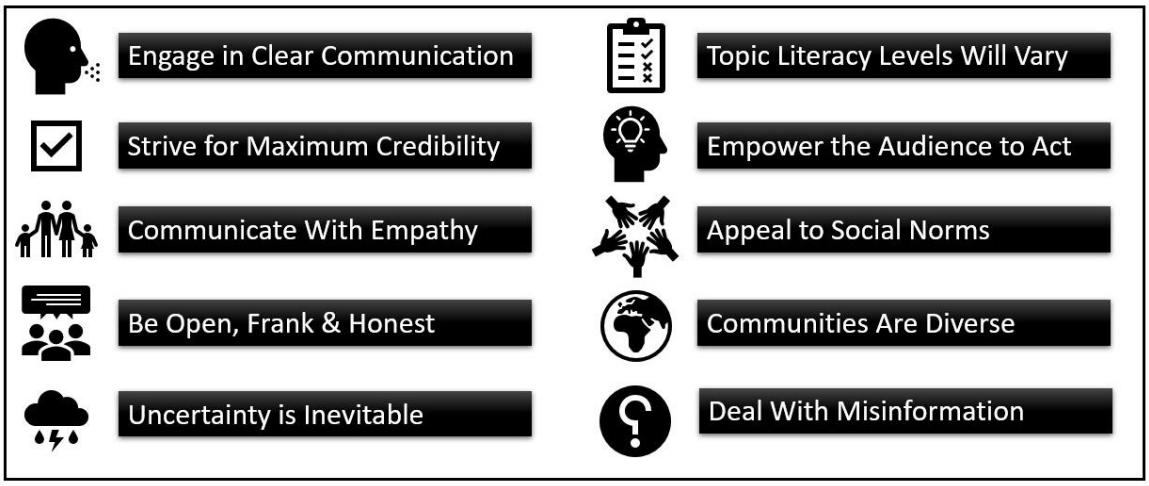


Figure 29: Ten factors that should be included in a communication strategy, adapted from Hyland-Wood et al. (2021)