



Turneffe Atoll
Sustainability Association

MARINE PROTECTED AREAS SOCIOECONOMIC MONITORING REPORT

2023



BELIZE

Socioeconomic Baseline Assessment of Coastal Communities Dependent on Five Marine Protected Areas in Belize

REPORT

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ACRONYMS

AWP	Annual Work Plan
BBRRS	Belize Barrier Reef Reserve System
BCMR	Bacalar Chico Marine Reserve
BE	Blue Economy
BFD	Belize Fisheries Department
BHNM	Blue Hole Natural Monument
BMPAN	Belize Marine Protected Areas Network
BTB	Belize Tourism Board
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CBOs	Community-Based Organizations
CCCCC	Caribbean Community Climate Change Center
CCMR	Caye Caulker Marine Reserve
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CZMAI	Coastal Zone Management Authority and Institute
DOE	Department of the Environment
ECP	Environmental Compliance Plan
EEZ	Exclusive Economic Zones
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERI	Environmental Research Institute (University of Belize)
ESIA	Environmental and Social Impact Assessment
FAO	Food and Agriculture Organization of the United Nations
FD	Belize Forest Department
FD	Fisheries Department
FPIC	Free Prior and Informed Consent
FR	Forest Reserve
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIZC	Integrated Coastal Zone Management
GM	Grievance Mechanism
GoB	Government of Belize
GRMR	Glover’s Reef Marine Reserve
HCMR	Hol Chan Marine Reserve
HMCNM	Half Moon Caye Natural Monument
HRI	Healthy Reefs Initiative
ICP	Informed Consultation and Participation
ICRAN	International Coral Reef Action Network
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IMF	International Monetary Fund

IPCC	Inter-Governmental Panel on Climate Change
IPF	Intergovernmental Panel on Forest
IPs	Indigenous Peoples
IUCN	International Union for Conservation of Nature
IWC	International Whaling Commission
KAP	Knowledge, Attitudes, Practices Survey
KPIs	Key Performance Indicators
LIC	Land Information Centre
MAFFESD	Ministry of Agriculture, Forestry, Fisheries, Environment and Sustainable Development
MAPs	Managed Access Program
MBECA	Ministry of Blue Economy and Civil Aviation
MCCAP	Marine Conservation and Climate Adaptation Project
MDGs	Millennium Development Goals
MEA	Multilateral Environmental Agreement
MEP	Maritime Economy Plan
MFEDI	Ministry of Finance, Economic, Development and Investment
MNRE	Ministry of Natural Resources and Environment
MOU	Memorandum of Understanding
MPAs	Marine Protected Areas
MRE	Mesoamerican Reef Ecosystem
NAP	National Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCCO	National Climate Change Office
NDC	Nationally Determined Contributions
NEAP	National Environmental Action Plan
NEMO	National Emergency Management Organization
NEP	National Energy Policy
NGOs	Non-Governmental Organizations
NLBI	Non-Legally Binding Instrument
NLUPP	National Land Use Policy and Planning Framework
NMS	National Meteorological Service
NOAA	National Oceanic and Atmospheric Agency
NPASP	National Protected Areas System Plan
NPESAP	National Poverty Elimination Strategy and Action Plan
NSTMP	National Sustainable Tourism Master Plan
OETS	Ocean Economy Trade and Strategies
OSPESCA	Organisation of the Fisheries and Aquaculture Sector of Central America
PA	Protected Area
PAP	Project Affected People
PDP	Plantation Development Plan
PHMR	Port Honduras Marine Reserve
POM	Project Operations Manual
RAMSAR	Convention on Wetlands of International Importance
SCMR	Sapodilla Cayes Marine Reserve
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment

SEMS	Socio-Environmental Management System
SIB	Statistical Institute of Belize
SOP	Standard Operating Procedure
SRF	Strategic Reference Framework
SWCMR	South Water Caye Marine Reserve
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TAMR	Turneffe Atoll Marine Reserve
TASA	Turneffe Atoll Sustainability Association
TKU	Traditional Knowledge and Use
TURF	Territorial User Right for Fisheries
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environmental and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNCSD	United Nations Conference on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNICEF	United Nations Children's Fund
WB	World Bank
WCS	World Conservation Strategy
WECAFC	Western Central Atlantic Fishery Commission
WHO	World Health Organization
WRI	World Resources Institute
WTO	World Trade Organization
WWF	World Wildlife Fund

DEFINITIONS

Coastal Community: A coastal community refers to a human settlement or group of settlements close to the coastline, often reliant on marine resources and ecosystems for sustenance, livelihoods, and cultural practices.

Conservation Zones: Conservation zones are designated to protect and conserve marine biodiversity and habitats. These areas may restrict fishing, anchoring, and other activities that could disturb sensitive ecosystems. Conservation zones often cover significant portions of marine protected areas and are crucial for maintaining biodiversity.

Employment: refers to the state of being engaged in paid work, including full-time, part-time, temporary, or self-employment activities. Labour force participation rates, unemployment rates, and job creation statistics typically measure this.

Ethnicity: Ethnicity denotes a shared cultural heritage, ancestry, language, religion, or other cultural markers that characterise a particular group of people. It is often used to categorise and identify individuals based on their cultural or racial backgrounds.

Fisherfolk: Fisherfolks are individuals or communities engaged in fishing activities, including commercial, artisanal, and subsistence fishing, as well as related occupations such as fish processing, boat maintenance, and equipment repair.

Focus Group Participants: Focus group participants participate in a structured discussion led by a moderator to gather insights, opinions, or experiences on a particular topic of interest. Focus groups are commonly used in qualitative research to explore attitudes, perceptions, and preferences within a specific population.

Gender: refers to the socially constructed roles, behaviours, identities, and expectations associated with being male, female, or non-binary in each society. It encompasses cultural, social, economic, and political dimensions of identity and power relations.

General Use Zones: These zones typically allow multiple uses, such as recreational activities, tourism, and sustainable fishing practices. They often cover larger areas of the marine protected area, including boating, swimming, and snorkeling zones.

Governance: refers to the process, structures, mechanisms, and practices through which decisions are made, policies are formulated, and resources are managed within a society, organisation, or institution. It encompasses principles of transparency, accountability, and participation.

Householders: Householders refer to individuals or families residing in households within a particular geographic area. They are typically used in demographic surveys or socioeconomic analyses to study household-level characteristics, behaviours, and living standards.

Income: refers to the monetary earnings or financial resources received by individuals, households, or organisations from various sources, including employment, investments, entrepreneurship, or government assistance. *It is* often used as a measure of economic well-being and standard of living.

Languages: Languages encompass the diverse linguistic systems and communication codes used by individuals or communities to convey meaning, express thoughts, and interact with one another, reflecting cultural diversity and heritage within a given society.

Marine Protected Area (MPA): A marine protected area is a designated marine or coastal area managed to achieve specific conservation, sustainable use, or ecosystem protection objectives. MPAs in Belize are established to conserve marine biodiversity, habitats, and ecosystem services while allowing for compatible human activities and sustainable resource use.

MPA Co-Management: Marine protected area co-management involves collaborative governance arrangements between government authorities, local communities, indigenous groups, NGOs, and other stakeholders to jointly manage and govern marine protected areas, sharing responsibilities, resources, and decision-making powers to achieve conservation and sustainable use objectives.

Marine Reserve: A marine reserve is a specific type of marine protected area with regulations prioritising conservation objectives. These regulations typically restrict or prohibit extractive activities such as fishing and mining to safeguard marine ecosystems, habitats, and species within their boundaries.

Marine Resources: Marine resources encompass the diverse living and non-living resources in marine and coastal environments, including fish stocks, coral reefs, mangroves, minerals, energy resources, and ecosystem services that support human well-being and economic activities.

Natural Monument: A natural monument refers to a legally designated area within Belize's protected area system with unique natural features, such as significant geological formations, rare species habitats, or outstanding natural landscapes. These areas are protected to conserve their ecological, scientific, cultural, or aesthetic values for present and future generations.

Nature-based Tourism: Nature-based tourism involves travel and recreation activities that focus on experiencing and appreciating natural attractions, environments, and wildlife. This form of tourism emphasises conservation, environmental education, and sustainable practices to minimise negative impacts on natural ecosystems.

Participatory Approach: A participatory approach is a methodological approach that emphasises the active involvement, empowerment, and collaboration of stakeholders, beneficiaries, or communities in the planning, implementation, monitoring, and evaluation of programs, projects, or policies, aiming to enhance ownership, accountability, and effectiveness.

Population Characteristics: Population characteristics encompass various demographic attributes and traits of a specific human population, including age distribution, gender composition, ethnicity, education levels, income levels, employment patterns, and cultural practices.

Preservation Zones: Preservation zones protect critical habitats, rare species, or important ecological processes. These zones typically have the highest level of protection and may be off-limits to all human activities to minimise human impact on sensitive ecosystems.

Regulatory Agency: A regulatory agency is a government authority or organisation responsible for developing, implementing, and enforcing regulations, policies, and standards within a specific sector or domain, including environmental protection, natural resource management, fisheries, tourism, and economic development. In marine conservation and management, regulatory agencies play a key role in overseeing compliance with laws and regulations governing marine protected areas, fishing activities, pollution control, and coastal development.

Respondents: Respondents are individuals or groups who participate in surveys, interviews, or questionnaires by providing answers or feedback to specific questions or inquiries, often used in research studies, evaluations, or data collection exercises.

Socioeconomic Monitoring: Socioeconomic monitoring involves the systematic collection, analysis, and evaluation of data related to the social and economic dimensions of a particular area or community. This monitoring aims to assess the impacts of policies, management actions, or external factors on human well-being, livelihoods, and community resilience.

Socioeconomic: Socioeconomic pertains to the interconnectedness of social and economic factors within a particular context, including the study of how societal structures, institutions, and policies influence economic activities, resource distribution, and human well-being.

Special Management Zones: Special management zones are areas designated for specific management objectives, such as research, education, or cultural preservation. Depending on their management goals, these zones may have varying restrictions.

Stakeholder Engagement: Stakeholder engagement involves the active involvement, consultation, and collaboration of individuals, groups, organisations, or communities with a vested interest or influence in a particular issue, decision, or project. It fosters dialogue, builds consensus, and promotes inclusive decision-making processes.

Sustainable Development: Sustainable development refers to a holistic approach to societal progress that balances economic growth, social equity, and environmental protection to meet the needs of the present without compromising the ability of future generations to meet their own needs.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	3
ACRONYMS	4
DEFINITIONS	7
TABLE OF CONTENTS	10
LIST OF FIGURES	11
LIST OF TABLES	12
EXECUTIVE SUMMARY	13
1. INTRODUCTION	14
1.1. BACKGROUND	15
1.1.1. <i>Marine Geographic and Natural Features</i>	15
1.1.2. <i>Social & Cultural Heritage</i>	15
1.1.3. <i>Economic Significance</i>	16
1.1.4. <i>Environmental Challenges</i>	17
2. CONTEXT	17
2.1. PURPOSE	17
2.2. OBJECTIVES	18
2.3. STUDY AREA.....	18
2.4. MPA PROFILES.....	19
2.4.1. <i>Blue Hole Natural Monument</i>	19
2.4.2. <i>Half Moon Caye Natural Monument</i>	21
2.4.3. <i>South Water Caye Marine Reserve</i>	23
2.4.4. <i>Port Honduras Marine Reserve</i>	26
2.4.5. <i>Turneffe Atoll Marine Reserve</i>	29
3. INSTITUTIONAL AND LEGAL FRAMEWORKS	34
3.1. NATIONAL LEGISLATION AND REGULATORY FRAMEWORKS	34
3.2. INTERNATIONAL COMMITMENTS	37
3.3. NATIONAL STRATEGIES & ACTION PLANS	40
4. METHODOLOGY	42
4.1. SAMPLE DESIGN.....	42
4.2. KEY VARIABLES DETERMINATION	42
4.3. SURVEY INSTRUMENTS	42
4.4. FOCUS GROUP DISCUSSIONS	43
4.5. KEY INFORMANTS' INTERVIEWS	43
5. FINDINGS	44
5.1. DEMOGRAPHY	44
5.1.1. <i>Critical Considerations – Demography</i>	46
5.2. ECONOMIC CONDITIONS	47
5.2.1. <i>Critical Considerations – Economic Conditions</i>	50
5.3. AWARENESS AND PERCEPTIONS	51
5.3.1. <i>Critical Considerations – Awareness and Perceptions</i>	57

5.4.	MARINE USES AND ACTIVITIES	58
5.4.1.	<i>Critical Considerations – Marine Uses and Activities</i>	62
5.5.	GOVERNANCE AND MANAGEMENT	63
5.5.1.	<i>Coastal Communities’ Interaction With Regulations</i>	65
5.5.2.	<i>Informal and Customary Rules</i>	66
5.5.3.	<i>Critical Considerations – Governance management</i>	68
5.6.	STAKEHOLDER ENGAGEMENT AND COMMUNICATION PREFERENCES.....	69
5.6.1.	<i>Critical Considerations – Communication Preferences</i>	73
7.	CONCLUSION.....	76
8.	REFERENCES	77
	ANNEX 1: POPULATION SAMPLE.....	82

LIST OF FIGURES

Figure 1: Location of Half Moon Caye and Blue Hole Natural Monuments (Source: BAS, Half Moon Caye and Blue Hole Natural Monuments – Management Plan 2008-2013).....	19
Figure 2: Halfmoon Caye Natural Monument (Source: Halfmoon Caye and Blue Hole Natural Monument Management Plan 2008-2013) (13).....	21
Figure 3: South Water Caye Marine Reserve zones (Source: Wildtracks, Southwater Caye Management Plan, 2019).....	23
Figure 4: Port of Honduras Marine Reserve zones (Source: Belize Fisheries Department) (18).....	26
Figure 5: Turneffe Atoll Zoning Map (Source: TASA)	29
Figure 6: Period of Residence in Communities.....	44
Figure 7: Age Distribution of Respondents	45
Figure 8: Main Languages Spoken.....	45
Figure 9: Highest Level of Education in Study Communities	46
Figure 10: Monthly Income Earned by Cluster Groups	47
Figure 11: Women’s Wild Seafood Harvesting Contributions	48
Figure 12: Employment Based on Occupation	49
Figure 13: Job Satisfaction by Cluster Group	50
Figure 14: Awareness of MPAs by Cluster Groups	51
Figure 15: Perceptions of the Importance of MPAs for Protecting Marine Ecosystems.....	52
Figure 16: Perceptions of the Importance of MPAs as Sources of Livelihood.....	52
Figure 17: Governance Perceptions - Perception of the Respect for Rules and Regulations by Tour Guides	53
Figure 18: Governance Perceptions (Compliance with Rules and Regulations by Fisherfolk) ...	53
Figure 20: Perceptions on Penalties for Illegal Fishing.....	54
Figure 21: Governance - Perceptions on Opening of Fishing Zones	54
Figure 22: Governance – Agreement on Increased Penalties for Illegal Fishing.....	55
Figure 23: Reasons for Recommending Marine Sites to Visitors	58
Figure 24 Most Active Months for Marine Activities (Seafood Harvesting).....	60
Figure 25: Perception of the Monitoring of Coastal Development by Cluster	63
Figure 26: Perception of Management Effort by Fisherfolk	64
Figure 27: Perception of Management Effort by Tourism Sector Respondents.....	64
Figure 28: Respondents Preferred Information Needs (Types and Locations of Different Species).....	70
Figure 29: Respondents Preferred Information Needs (Tides, Channels, Currents)	70
Figure 30: Respondents Preferred Information Needs (Marine Inventory-Products and Services)	70

Figure 31: Respondents Preferred Information Needs (Fragile and Vulnerable Marine areas) ..	70
Figure 32: Respondents' Preference for Community meetings.....	71
Figure 33: Respondents' Preference for Participation in Community project work	71
Figure 34: Respondents' Preference for Virtual Meetings.....	71
Figure 35: Respondents' Preference for Participation in Surveys	71
Figure 36: Respondents' communication preferences (Radio Talk Shows)	72
Figure 37 Respondents' communication preferences (Social Media Platforms)	72
Figure 38: Respondents' communication preferences (WhatsApp Messages)	72
Figure 39: Respondents' communication preferences (Website Information)	72

LIST OF TABLES

Table 1 : Key Features and Attributes of the Blue Hole Natural Monument (Source: Blue Hole Natural Monument Management Plan 2008-2013).....	19
Table 2: The Key Features and Attributes of the Halfmoon Caye Natural Monument (Source: BAS)	21
Table 3: Key Features and Attributes of the Turneffe Atoll Marine Reserve (Source: Turneffe Atoll Management Plan).....	31
Table 4: Critical Attributes of TAMR Source: Turneffe Atoll Management Plan)	32
Table 5: Participants' Perception of Marine Conservation Changes and Suggestions for Actions	56
Table 6: MPA Topics of Interest Among Marine Resource Users	69
Table 7 shows the summary of data collected on 23 rd November 2023	82
Table 8 shows the sample size per survey instrument	82

EXECUTIVE SUMMARY

In 2023, the Turneffe Atoll Sustainability Association (TASA) spearheaded a baseline socioeconomic study for five Marine Protected Areas (MPAs): **Blue Hole Natural Monument (BHNM)**, **Half Moon Caye Natural Monument (HMCNM)**, **Port Honduras Marine Reserve (PHMR)**, **South Water Caye Marine Reserve (SWCMR)**, and **Turneffe Atoll Marine Reserve (TAMR)**. This study is part of the Gulf and Caribbean Fisheries Institute's MPA Connect Initiative to gather data on coastal communities and enhance the capacities of MPA managers to integrate socioeconomic monitoring as a standard practice in the management of the MPAs.

The primary goal of the study is to understand the socioeconomic dynamics within the identified communities and stakeholders that impact and are impacted by the MPAs through use of their resources. Using quantitative and qualitative research methods, including surveys, focus groups, and interviews conducted from October 2023 to January 2024, the results of the study offer data and insights informed by the demographics, livelihoods, perceptions, practices, governance and social activities of the target marine users. Drawing on the Socioeconomic Monitoring (SocMon) guidelines, data for the key indicators selected by the MPA managers was collected for six (6) thematic areas below.

1. **Demographics:** provide the details of the individuals and households, communities in which they reside, length of time within the community, age, gender, ethnicity, educational and religious background.
2. **Economic Conditions:** document marine resource users' employment and income including, expenditures or patterns of expenses for necessities and utilities.
3. **Awareness and Perceptions:** inform on social awareness and overall perceptions of the marine environment, governance, and regulation enforcement.
4. **Governance and Management:** revision and assessment of the perceived effectiveness of policies, laws, and regulations governing fisheries, tourism, coastal development, and marine conservation.
5. **Marine Uses and Activities:** elaborate on the extent of the respondents' dependency on marine resources and the frequency of their interactions in the marine areas.
6. **Stakeholder Engagement and Communication Preferences:** provide a basic understanding of the respondents' preferences for communication, decision-making and information sharing.

The findings highlight that resource users impacting the five MPAs come from a varied demographic, and they primarily earn seasonal incomes from tourism products and services and wild seafood harvesting (fishing). Most of their economic activities and livelihoods are also influenced by sociocultural dynamics. For instance, men predominate in visible marine-related jobs, whereas women often engage in less visible roles, mostly within their households and communities but they are integral to marine-related occupations and economic activities.

The study also highlights the preferences of marine resource users to receive pertinent information through social media generally and through community-based activities for in-depth learning and decision-making. Moreover, respondents indicate a strong awareness of marine protection regulations but express notable concerns over the perceived lack of consistency in enforcement especially for illegal activities and repeat offences. They are also desirous of partnerships with managers of marine protected areas that recognise their experiences in and contributions to marine resource harvesting and use. The results of the baseline socioeconomic study underscore the importance of MPAs for the sustainability of the marine environment and it offers additional programming perspectives for MPA managers. The insights are also important for responsive policy and program development for marine protection and conservation.

1. INTRODUCTION

The Belize Barrier Reef Reserve System, a UNESCO World Heritage Site, encompasses several Marine Protected Areas (MPAs) that play critical roles in safeguarding the country's marine resources and supporting the livelihoods of coastal community dwellers. The impact of population growth or decline, climate change, and economic development makes an understanding of the socioeconomic dynamics in MPAs and the adjacent coastal communities paramount for effective management and informed decision-making by all stakeholders.

This report presents the main findings of the Socioeconomic Monitoring Baseline Study, conducted for five (5) MPAs and 21 coastal communities that impact the resources they provide. The study generated baseline data on the current socioeconomic status, livelihood patterns, resource dependencies, governance structures, and stakeholder perceptions in these areas.

By examining some of the drivers, challenges, and opportunities shaping the socioeconomic landscape of the coastal communities that directly impact on the MPAs, this report seeks to inform evidence-based policies, strategies, and interventions that can promote the resilience and long-term health of Belize's marine ecosystems and coastal communities.

Sustainable protection and sound management of these resources require that managers have the capacities and tools to understand the dynamics and realities of the stakeholders who use the marine resources. These capacities and skills are critical for day-to-day management and the upkeep of domestic and international conservation commitments and protection targets. In this regard, two main goals guided this study. These are firstly to:

1. establish socio-economic baseline data and information on coastal communities that are dependent on, use, or are adjacent to the five participating MPAs; and secondly,
2. build the capacities of MPA Managers to conduct socioeconomic monitoring on an established and consistent basis.

To meet these goals, a modified version of the Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean or “SocMon” was adopted for the conduct of the socioeconomic baseline assessment. This approach facilitates the regular collection of primary socioeconomic data, which is valuable for coastal management at the site level. Additionally, the SocMon was supplemented with the Global Coral Reef Monitoring Network (GCRMN) Socioeconomic Manual for Coral Reef Management, which provided the framework for collecting primary socioeconomic data, which is also valuable for coastal management at the site level.

After establishing the purpose and objectives of the study, this baseline study report provides contextual information and a brief profile of each of the MPAs. Further, the report elaborates on the survey's main findings incorporating results of the FGDs and the key informants' interviews. These findings are central to the five (5) main elements of the baseline study: *demographics, income, material lifestyle, awareness and perception, coastal and marine activities and practices, and communication preferences*. Building on the findings of the FGDS, the study also discusses stakeholder engagement and partnerships for effective MPA management. The report concludes the findings of each of the thematic areas with key matters for consideration and offers recommendations for integration in the projects and programs that MPA managers develop and implement.

1.1. BACKGROUND

1.1.1. MARINE GEOGRAPHIC AND NATURAL FEATURES

Though a relatively small country in Central America and the Caribbean, Belize boasts a healthy and diverse natural environment. The country has many natural wonders, including pristine coral reefs, lush mangrove forests, vibrant marine life, coastlines, and coastal communities that stand as beacons of biodiversity and cultural richness.

The Belize Barrier Reef (BBR) is the second-largest reef system in the world, and it dominates Belize's marine landscape. This UNESCO World Heritage Site serves as a vital repository of marine biodiversity, including vibrant coral formations, intricate reef structures, and diverse marine species.

The coastal region is also punctuated with many mangrove forests, coastal wetlands, and picturesque cayes (small islands), each contributing to rich habitats and ecosystems in the MPAs. These ecosystems provide critical breeding grounds for fish and crustaceans, protect coastal communities from erosion and storm surges, and act as carbon sinks for climate regulation and resilience.

1.1.2. SOCIAL & CULTURAL HERITAGE

Along Belize's 386-kilometer coastline there are approximately 50 coastal communities, each characterised by unique population densities and geographic features. While the national population is established at 441,471 (1), an estimated 37% reside primarily in coastal communities. (2 p. 3) The national population density in the same period was 17.64 people per square kilometre, marking a 1.31% increase from the previous year. (1)

Marine resources play a pivotal role in the daily lives of many residents in Belize's coastal communities. These communities have shaped the social, economic, and environmental ethos of the coastal landscape from bustling fishing villages to serene beachside towns. Coastal communities possess their unique blend of ethnic and cultural diversity and heritage, reflecting the diversity of Belizean coastal life.¹ Moreover, traditional fishing practices, local and international tourism, cultural practices, and artisanal crafts are woven into the fabric of coastal life. The social dynamics and economic pursuits connect these communities with the marine environment.

Urbanisation is also expanding in coastal communities, from bustling hubs like Belize City and tourist magnets like San Pedro and Placencia to smaller villages that are reliant on traditional livelihoods like fishing and agriculture. These urbanised coastal areas have witnessed some population growth, even post the COVID-19 pandemic, which is partly fueled by migration from rural areas and international tourism. (3) (4) Smaller coastal villages maintain a more stable or notable declining population size but both types rely on traditional livelihoods. (1) Coastal

¹ *These coastal communities harbor a rich cultural heritage, each contributing its unique flavor to Belize's cultural mosaic. The population of Belize is a melting pot of ethnicities, including indigenous Maya communities, Garifuna, Creole, Mestizo, East Indians, Mennonites and others, each adding their unique flavor to the cultural mosaic of the region.*

communities exemplify the interplay between nature and cultural heritage, resilience, and sustainability. However, these communities still face challenges, especially socio-economic disparities and vulnerability. These populations face distinct socio-economic barriers hurdles highlighting the need for targeted interventions to enhance inclusivity and equity.

Belize's coastal communities embody a blend of cultural heritage, economic activities, and environmental stewardship. The resilience and adaptability of coastal societies to navigate the intricacies of modernisation and its attendant social and economic challenges require greater understanding to address these challenges and foster the well-being of all inhabitants.

1.1.3. ECONOMIC SIGNIFICANCE

Belize's marine resources are a cornerstone of its economic prosperity, driving growth, employment, and sustainable development across national and local economies.

○ **GDP Contribution**

Marine resources substantially contribute to the nation's Gross Domestic Product (GDP). Between 2015 to 2021, 12% of expert earnings were derived from the fisheries sector which includes fisheries and aquaculture combined. (5) Belize's primarily artisanal fishery is concentrated in the relatively shallow waters of the reef platform to provide direct employment for approximately 3100 fisherfolk. (6) These fishers harvest spiny lobsters, queen conch, snapper, and grouper. However, other species are also harvested according to the season and geography of different fish stocks. Fishers apply a multi-species and multi-gear approach to seafood harvesting to comply with the varied seasons while sustaining their households and income generating capabilities. (6) Generally, the fishing sector has made substantial contributions to the Belize's economic development by generating employment, enhancing food security, boosting income, and earning foreign exchange.

At the same time, the tourism sector relies heavily on Belize's pristine marine environment, with activities such as diving, snorkeling, and sport fishing attracting thousands of visitors annually, bolstering GDP rates and promoting economic diversification. Tourism is also an essential source of livelihood for residents of coastal communities. Nature-based tourism is one of the country's most important foreign exchange sources and income earner, accounting for 41.3% of Belize's GDP, with USD 766.8mn in 2022. (1) In this same period, more than 40% of Belize's nature-based tourism was estimated to be derived from marine environments.² (7) The tourism sector generates significant foreign exchange, jobs and boosts the national economy.

○ **Employment Generation**

Beyond its contribution to the GDP, marine resources also generate employment opportunities for local communities, particularly those living along the coast. Indeed, the marine sector employs more than 28,000 people through reef-related tourism products. (8) In addition to employing more than 3,100 fisherfolk (primarily involved in artisanal fishing) the fisheries and aquaculture sector also provides employment for approximately 17,000 individuals in fisheries administration, aquaculture, seafood processing, and exporting roles. (8) (9) (4). Consequently, the marine-related industries employ over 20%

² The information regarding the approximate percentage derived from reports from the Belize Tourism Board, NGO's research, and the World Tourism Organization (UNWTO), the World Travel & Tourism Council (WTTC), and the United Nations Environment Programme (UNEP), which may provide global or regional analyses on tourism trends

of the country's labour force, encompassing a wide range of trades and professions, including tour guides, fishers, boat captains, marine biologists, conservationists, and hospitality staff³. (8) (4) (5) Marine-related employment sustains livelihoods, empowers coastal communities, and reduces unemployment rates. It also creates indirect job opportunities in supporting sectors, amplifying a positive socioeconomic impact.

1.1.4. ENVIRONMENTAL CHALLENGES

The coastal communities of Belize are surrounded by natural beauty, but they face multiple environmental challenges that threaten their ecological integrity and resilience. Marine ecosystems and coastal communities are threatened by habitat degradation, extensive fishing, pollution, and the impacts of climate change. Tourist-driven coastal development and urbanisation have also contributed to habitat losses and fragmentation, disrupting critical ecosystems such as mangroves and seagrass beds. Additionally, runoff, sewage, and pollution from marine debris have degraded water quality, stifled coral reefs, and impacted the populations of marine life. Climate change has also amplified threats from rising sea levels, ocean acidification, and more frequent and intense storms that have heightened risks to coastal communities and ecosystems.

Nonetheless, Belize is committed to protecting and sustaining its coastal resources and central to this commitment is the establishment of MPAs and designated zones for biodiversity conservation and ecosystem restoration. The MPA network encompasses diverse habitats along the entire coast, each playing a vital role in supporting marine life and coastal communities. These natural resources are central to sustainable tourism, fisheries management, and the livelihood of a large population of Belizean households.

2. CONTEXT

As part of its protection and conservation commitments, the Turneffe Atoll Sustainability Association (TASA) commissioned the conduct of a baseline socio-economic study to serve as the basis for data and information that can enable an understanding of the communities and residents that interact with the MPAs in the study. This study covers five marine protected areas, namely the **Port Honduras Marine Reserve, Half Moon Caye Natural Monument, Blue Hole Natural Monument, South Water Caye Marine Reserve, and Turneffe Atoll Marine Reserve**, which are members of the Gulf and Caribbean Fisheries Institute's MPA Connect Initiative.

2.1. PURPOSE

The fundamental premise for conducting the SocMon assessment is to support the mainstreaming of monitoring as a standard practice in coastal management. TASA, as the lead entity and the other participating MPA management entities determined that the four (4) main functions that this study serves are to:

³ *Employment in the tourism sector includes tour guides, tour operators, dive masters, boat operators, guesthouse owners, gift shop owners, restaurant or fast-food outlet owners, hotel and resort staff, construction workers, and boat or marine vessel transportation. Workers in the tourism sector may also be self-employed as fishermen.*

- demonstrate the importance and value of marine resources and services in *generating community and stakeholder support* for resource management programs.
- inform the possible *impacts of management and policy decisions* on the stakeholders with a view to minimise adverse outcomes (do no harm).
- provide some basis for assessing the *effectiveness of coastal resource management* programs in achieving their goals and objectives.
- increase MPA managers' understanding of marine resource-dependent *communities and households* when establishing baseline conditions for future change comparisons.⁴

2.2. OBJECTIVES

The study's main objective is to gather and document data on the socioeconomic conditions present in the identified communities. It was completed through a participatory process that afforded MPA managers with the skills to build on this practice and regularly collect community data to monitor socioeconomic conditions that are present in the target communities. When enacted, managers will strengthen their capacities to collect, evaluate and disseminate socioeconomic data for improved engagements and partnerships with marine resource users in the MPAs. As part of this study, training materials and activities were also developed and implemented with the managers.

2.3. STUDY AREA

With some adoption of the SocMon methodology, the “study area” refers to the location of the coastal and marine resources, including the stakeholders who benefit from or are impacted by any changes within the marine area. (10) As such, the boundaries of this study area are determined by the physical location of the resources where the study participants and respondents live and work. The delineation of the study area was also informed by the recommendations of the steering committee who are also managers of the MPAs that were studied. (10) Of note, the five (5) participating MPAs also constitute the Gulf and Caribbean Fisheries Institute MPA Connect Network Initiative. The five MPAs in the “study area” encompass an estimated total area of 596,887 acres or 241551.6 hectares. Each MPA differs in size and is governed based on conservation commitments and applicable regulations for fishing, tourism, and other marine-related activities.

⁴ *This baseline information can be especially useful in adaptive management. As the goals and activities of programs change, managers can compare current conditions with the baseline to identify causes of changes as well as the effects of change (29).*

2.4. MPA PROFILES

2.4.1. BLUE HOLE NATURAL MONUMENT

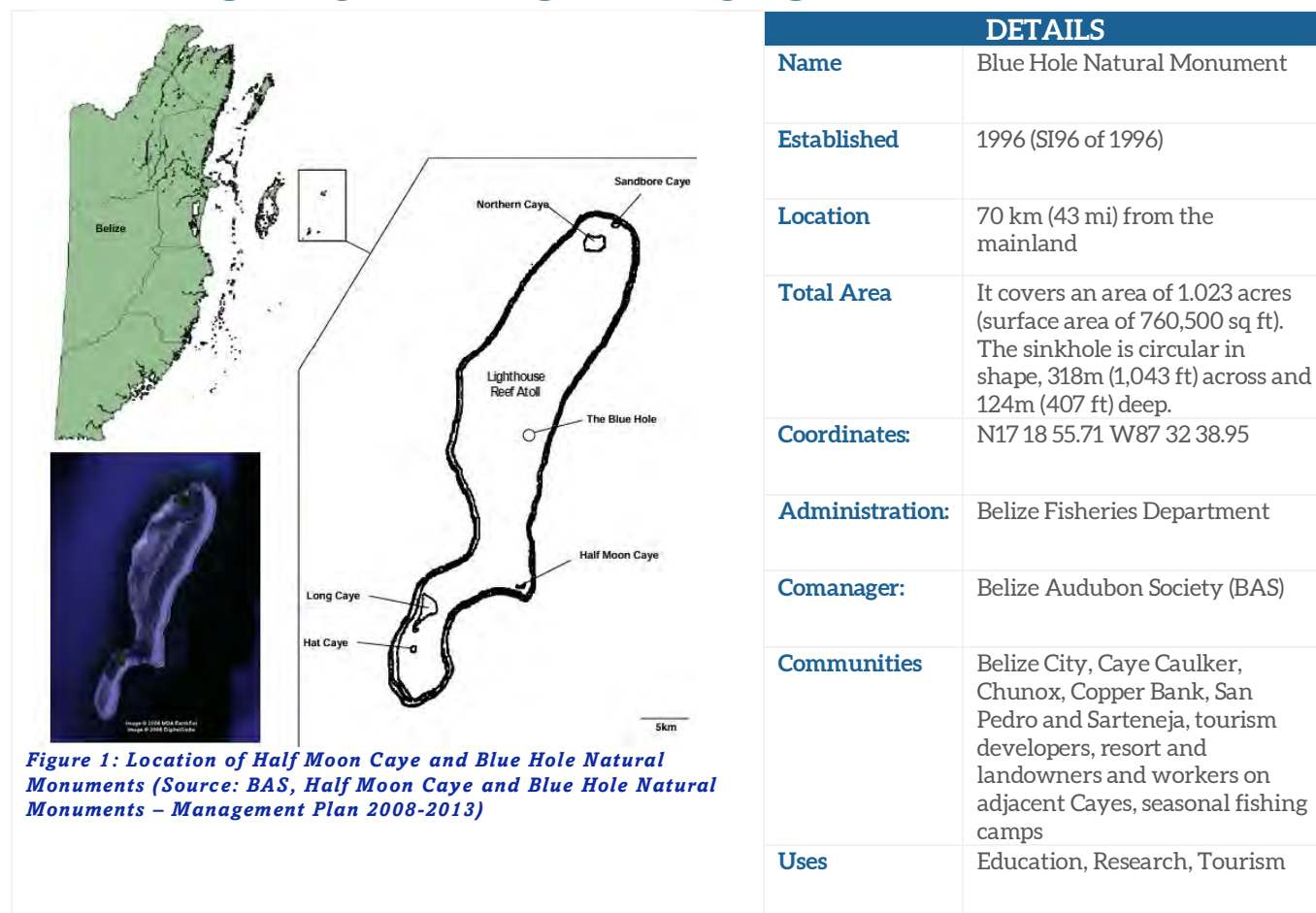


Figure 1 : Location of Half Moon Caye and Blue Hole Natural Monuments (Source: BAS, Half Moon Caye and Blue Hole Natural Monuments – Management Plan 2008-2013)

Table 1 : Key Features and Attributes of the Blue Hole Natural Monument (Source: Blue Hole Natural Monument Management Plan 2008-2013)

Key Features and Attributes of the Blue Hole Natural Monument		
<ul style="list-style-type: none"> ○ Examples of highly developed barrier reef structures in the region 	<ul style="list-style-type: none"> ○ Steep-sided faros in the Pelican Cayes area 	<ul style="list-style-type: none"> ○ Marine ecosystems important for the sustainability of commercially important species
<ul style="list-style-type: none"> ○ Extensive spur and groove formation ○ Deep water channels 	<ul style="list-style-type: none"> ○ Established UNESCO World Heritage Site in 1996 ○ Tobacco Range supports nationally essential nursery areas for the queen conch 	<ul style="list-style-type: none"> ○ Nesting sites for several nationally important bird species ○ Nesting beaches for marine turtles, e.g. hawksbill and green turtles
<ul style="list-style-type: none"> ○ Sheltered waters and oceanic mangrove systems 	<ul style="list-style-type: none"> ○ Exposed reef and sand cayes provide nesting sites for several tern species 	<ul style="list-style-type: none"> ○ Number of endemic species and species new to science
<ul style="list-style-type: none"> ○ Shallow northern back-reef lagoon between the reef crest 	<ul style="list-style-type: none"> ○ High connectivity between littoral forest, mangrove, seagrass, and reef 	<ul style="list-style-type: none"> ○ Aesthetic beauty of the cayes and reef supports the nature-based tourism industry

Area & Location

The Blue Hole Natural Monument (BHNM), a massive marine sinkhole, forms part of the more extensive Belize Barrier Reef Reserve System (BBRRS), a UNESCO World Heritage Site. (11) It is located near the centre of the Lighthouse Reef Atoll, about 70 km (43 mi) from Belize City. The hole is estimated to be 318 m

(1,043 ft) in diameter and 125m (412 ft) deep, with a surface area of 70,650 square meters (760,500 sq ft). (12)

Features and Attributes

The Blue Hole Natural Monument (BHNM) was designated a natural monument in 1981 and formed part of the Barrier Reef System World Heritage site system in 1996. (12) Owing to the unique geological formations within the sinkhole, it is the most iconic natural monument for research, a tourism destination for divers, and protection of coral reef systems and coastlines. The BHNM has significant scientific value, providing data on past geological events for future ecoregional planning. Many of its marine species remain unknown. As a national tourism resource, the Blue Hole is one of the best-known tourism destinations in Belize, attracting divers from all over the world.

Strict 'no-take', non-extractive use policies govern interactions in and around the Blue Hole Natural Monument, a protective habitat for many marine species⁵, such as the white-lined toadfish still being discovered and protected. (12 p. 17) As a "no-take" zone, coral reefs and seagrass beds in the area of the Blue Hole's also support ecosystems needed for the different life stages of commercial and non-commercial marine species. The area also provides ecosystem services, including protecting beaches from erosion and storm surges within the atoll, the main barrier reef, and the coastline. (12 p. 18)

Communities Adjacent

The main stakeholders of the Bluehole are those who partake in recreational marine tourism and fishing. Although there are no communities within the atoll, several private vacation houses, tourism developments (resorts), and live-aboard dive boats are in the area. Resort and private landowners, resident employees and rangers often use the area. Since most activities are day tourism-oriented, most trips for tourists are from Caye Caulker, San Pedro, Belize City, and Placencia. This MPA is also impacted by fishers from Belize City, Caye Caulker, Chunox, Copper Bank, San Pedro and Sarteneja who set up fishing camps in or adjacent to this area.

Management

The Belize Audubon Society (BAS) co-manages this protected area. The managers are involved in developing and implementing a comprehensive management plan for the Blue Hole Natural Monument and the Halfmoon Caye Natural Monument, two of the nine protected areas that BAS co-manages. It plays a significant role in supporting Belize's marine sectors through its conservation efforts and advocacy initiatives. As a leading non-profit organization dedicated to the protection of Belize's natural heritage, BAS actively promotes the preservation of marine ecosystems, including coral reefs, mangrove forests, and coastal wetlands. Through community outreach programs, educational campaigns, and collaborative partnerships, BAS raises awareness about the importance of marine conservation and sustainable resource management practices. Additionally, BAS engages in research and monitoring activities to assess the health of marine ecosystems and identify conservation priorities. By working closely with government agencies, local communities, and other stakeholders, BAS also helps to develop and implement policies and regulations that safeguard marine biodiversity and promote the sustainable use of marine resources.

⁵ It is estimated that well over 289 reef fish species are present.

2.4.2. HALF MOON CAYE NATURAL MONUMENT

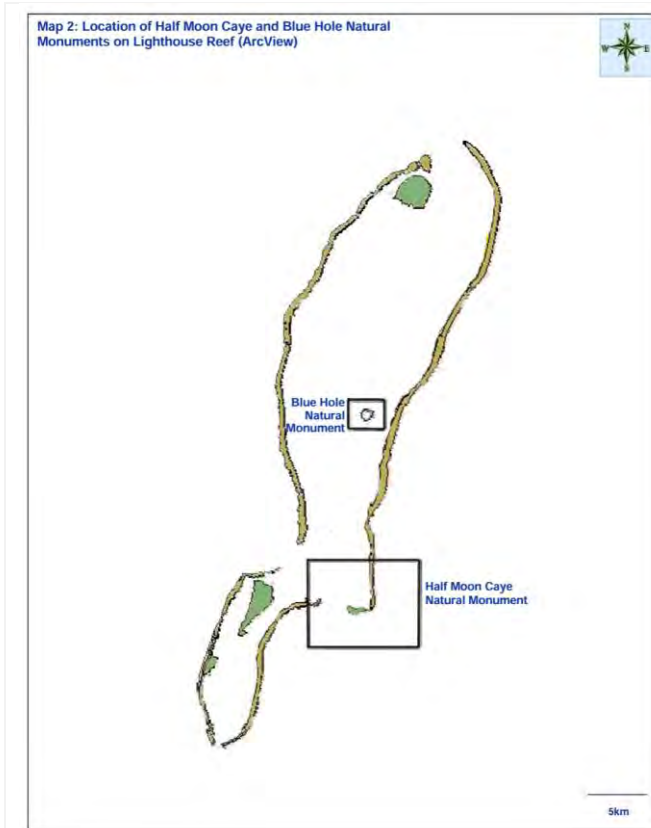


Figure 2: Halfmoon Caye Natural Monument (Source: Halfmoon Caye and Blue Hole Natural Monument Management Plan 2008-2013) (13)

DETAILS	
Name	Halfmoon Caye Natural Monument
Established	1982 (SI30 of 1982)
Location	Belize Barrier Reef. It lies 18km east of the mainland and west of the most southerly point of Glover's Reef Atoll.
Total Area	9.771 acres
Coordinates:	N17 12 14.97 W87 32 11.74
Administration:	Belize Fisheries Department and Belize Forest Department
Comanager:	Belize Audubon Society (BAS)
Communities	Belize City, Caye Caulker, Chunox, Copper Bank, San Pedro and Sarteneja, tourism developers, resort and landowners and workers on adjacent cayes, seasonal fishing camps
Uses	Education, Research, Tourism

Table 2: The Key Features and Attributes of the Halfmoon Caye Natural Monument (Source: BAS)

Key Features and Attributes of the Half Moon Caye Natural Monument		
<ul style="list-style-type: none"> ○ Spur and groove coral formations harbour over 280 species of fish 	<ul style="list-style-type: none"> ○ Coral reefs in both protected areas are essential resources for tourism and recreation 	<ul style="list-style-type: none"> ○ Marine ecosystems important for the sustainability of commercial and non-commercial species
<ul style="list-style-type: none"> ○ Sandy beaches, which are an important nesting site for two species of marine turtle, the loggerhead and green turtles 	<ul style="list-style-type: none"> ○ One of the first and oldest protected areas in Belize 	<ul style="list-style-type: none"> ○ Nesting sites for the red-footed booby, magnificent frigatebird colony, white-crowned pigeons and other migratory species
<ul style="list-style-type: none"> ○ Littoral forest critical habitat for the island's leaf-toed gecko and Allison's anole, two lizard species 	<ul style="list-style-type: none"> ○ Research for greater knowledge of marine and terrestrial environments and species within the area 	<ul style="list-style-type: none"> ○ Nesting beaches for marine turtles, e.g. hawksbill and green turtles
<ul style="list-style-type: none"> ○ Coral reefs are among the most productive habitats, producing 2,000 decagrams of carbon per square meter per year. 	<ul style="list-style-type: none"> ○ Exposed reef and sand cayes provide nesting sites for several tern species 	<ul style="list-style-type: none"> ○ Employment and Income generation, providing jobs for tourism workers, attracting thousands of visitors annually, and significant foreign revenue
<ul style="list-style-type: none"> ○ Protection of beaches within the atoll, the main barrier reef itself, 	<ul style="list-style-type: none"> ○ significant historical, archaeological Maya site where 	<ul style="list-style-type: none"> ○ Renowned dive-associated tourism as iconic Features and Attributes

and the coastline from storm surges and waves	these Mayan artefacts remain today.	and aesthetic beauty support the tourism industry
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Area & Location The HMCNM was the first nature reserve established in Belize under the National Park System Act in 1981 and the first marine protected area in Central America. It is part of the BBRRS World Heritage Site. The island (41.5 acres) and natural monument are located at the southeast corner of Lighthouse Reef Atoll and 83km (52 miles) from the mainland. The area covers an estimated 39.59 square kilometres or 9700 acres of both terrestrial and marine area. (13)

Features and Attributes Half Moon Caye Natural Monument is Belize's oldest site for wildlife protection since it was first designated as a bird sanctuary in 1924 to protect the habitat of the red-footed booby birds. (12) Because of its well-known geological value and strict, 'no-take' non-extractive use policies, this monument is also famous for its rich marine ecosystems of littoral forest and protective marine habitats for critically endangered or vulnerable marine species. These species include the Hawksbill turtle, Loggerhead turtle, Goliath Grouper, Black Grouper, Nassau Grouper, Whale Shark, Queen Triggerfish, Hogfish, Cubera snapper, and the American Crocodile. There is a plethora of marine species.⁶, at HMCNM, such as the white-lined toadfish still being discovered and protected. (12 p. 17) As a "no-take" zone, the HMCNM protects its coral reefs and seagrass beds, supporting the sustainability of both commercial and non-commercial marine species. Like the BHNM, this area also provides a range of critical ecosystem services for protection from beach erosion and storm surges within the Lighthouse Atoll, the main barrier reef, and the coastline. (12) Half Moon Caye is also a significant historical Maya settlement, where historical artefacts remain.

Communities Adjacent HMCNM includes the terrestrial component of the Half Moon Caye itself and marine areas where several important and endangered species are protected. The coastal communities that impact this MPA are Belize City, Caye Caulker, Chunox, Copper Bank, San Pedro and Sarteneja. The main stakeholders in this area are resorts or private landowners, resident employees, and rangers of the Lighthouse Atoll. Like the Blue Hole, most Half Moon Caye Marine Reserve activities are day tours from Caye Caulker, San Pedro, Belize City, and Placencia. This MPA is also impacted by fishers from Belize City, Caye Caulker, Chunox, Copper Bank, San Pedro and Sarteneja, who would set up fishing camps on or adjacent to Half Moon Caye. Researchers, interns, and students on educational expeditions also benefit from using this area.

Management Half Moon Caye Natural Monument is managed through a co-management agreement between the Belize Audubon Society and the Fisheries Department and the Protected Areas office of the Forest Department of the Government of Belize.

⁶ It is estimated that well over 289 reef fish species are present in the area.

2.4.3. SOUTH WATER CAYE MARINE RESERVE

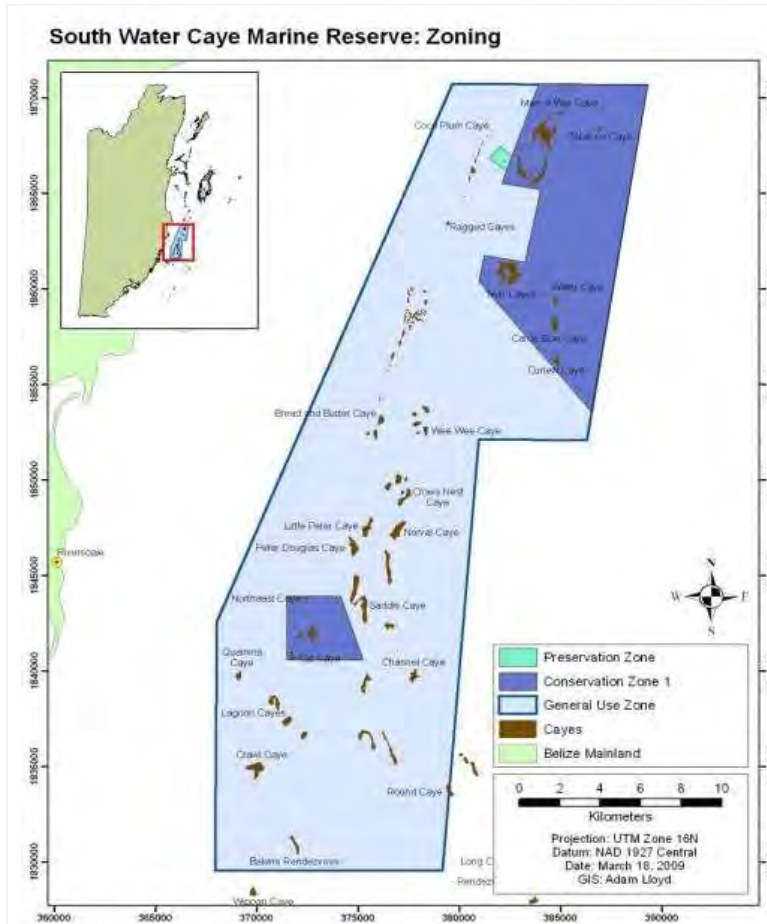


Figure 3: South Water Caye Marine Reserve zones
(Source: Wildtracks, Southwater Caye Management Plan, 2019)

DETAILS	
Name	Southwater Caye Marine Reserve
Established	1996 (SI118 of 1996)
Location	The Belize Barrier Reef is 18km east of the mainland and west of the most southerly point of the Glover's Reef atoll.
Total Area	117,875 acres (approximately 47,700 hectares)
Coordinates:	16°49'09.29" N, 88°05'00.68" W
General Use Zone:	Approx 95,597 acres (38,687 hectares) - 81.1%
Preservation Zone:	Approx 190 acres (76.6 hectares) - 0.16%
Conservation Zone:	covers approximately 22,143 acres (8,961 ha, or 18.7%)
Administrator:	Belize Fisheries Department
Comanager:	Formerly Southern Environmental Association (SEA). Pending new co-management.
Communities	Dangriga Town, Hopkins, Sarteneja, Riversdale, Placencia, Monkey River, Independence, and Tobacco Caye seasonal communities
Uses	Extractive and non-extractive - commercial artisanal, subsistence, sports or recreational fishing, tourism, education and research

Table 3: The Key Features and Attributes of the Southwater Caye Marine Reserve (Source: Southwater Caye Management Plan 2018-2023)

Key Features and Attributes of the Southwater Caye Marine Reserve		
<ul style="list-style-type: none"> ○ Examples of highly developed barrier reef structures in the region 	<ul style="list-style-type: none"> ○ Steep-sided faros in the Pelican Cayes area 	<ul style="list-style-type: none"> ○ Marine ecosystems important for the sustainability of commercially important species
<ul style="list-style-type: none"> ○ Extensive spur and groove formation 	<ul style="list-style-type: none"> ○ Established UNESCO World Heritage Site in 1996 	<ul style="list-style-type: none"> ○ Nesting sites for several nationally important bird species
<ul style="list-style-type: none"> ○ Deep water channels 	<ul style="list-style-type: none"> ○ Tobacco Range supports nationally important nursery areas for the queen conch 	<ul style="list-style-type: none"> ○ Nesting beaches for marine turtles, e.g. hawksbill and green turtles
<ul style="list-style-type: none"> ○ Sheltered waters and oceanic mangrove systems 	<ul style="list-style-type: none"> ○ Exposed reef and sand cayes provide nesting sites for several tern species 	<ul style="list-style-type: none"> ○ Number of endemic species and species new to science
<ul style="list-style-type: none"> ○ Shallow northern back-reef lagoon between the reef crest 	<ul style="list-style-type: none"> ○ High connectivity between littoral forest, mangrove, seagrass and reef 	<ul style="list-style-type: none"> ○ Aesthetic beauty of the cayes and reef supports the nature-based tourism industry

Area & Location

Established by the Fisheries Department in 1996, the SWCMR covers 117,875 acres (or approximately 477.02 square kilometres). It is one of the seven protected areas that form the Belize Barrier Reef Reserve System World Heritage Site designated by UNESCO and the second largest marine reserve in Belize. (14) As it lies on Belize's continental shelf, SWCMR encompasses numerous submerged mangrove islands.

Features and Attributes

The area is a priority for conservation due to its vibrant biodiversity. It sustains important mangrove and coral reef systems and extensive seagrass meadows, that provide valuable habitats for commercial and non-commercial marine species benefitting, artisanal fishing, and tourism industries. (15) Mangrove cayes provide nesting sites for important bird species, and marine turtles use the numerous sand bores for nesting. (15) The area provides valuable habitats for commercial species, such as the queen conch.⁷ and Caribbean spiny lobster⁸, the species that form the foundation of Belize's traditional fishing industry, supporting coastal communities from the north to south. (15)

The area provides essential nursery functionality for many fish species, crocodiles, lobster, conch, and other species. In addition, at least three known important fish spawning aggregation sites have been identified in SWCMR. (16) The atoll supports several threatened and endangered species and significantly contributes to Belize's fisheries sector, primarily through lobster, conch and finfish harvesting. (17). Belizean fishermen have fished the area for many years and are considered to have traditional rights to the fishing grounds. However, the marine reserve zones regulate this access to some extent, and this is further strengthened through the Managed Access Program with SWCMR in Area 3. Additionally, the atoll is renowned for its nature-based tourism, including sport fishing and scuba diving, snorkeling and eco-tours, and it is also an important centre for marine research. (17) The area is traditionally used as a recreational retreat for local Belizeans and has developed a remarkable reputation for nature-based tourism destination.

Communities Adjacent

The primary stakeholders of SWCMR are residents of the fishing and tourism sectors from the coastline communities on the mainland. Notably, there are no permanent communities within the Southwater Caye Marine Reserve, except for Tobacco Caye on which there is a seasonal community of fishermen and tourism facilities owners and workers. The fishing communities dependent on this MPA are Dangriga, Sittee River, Hopkins and Sarteneja, Chunox, Copper Bank, Placencia, and Seine Bight who use the area for commercial, artisanal and subsistence fishing. There has been significant growth in the use of the area as a tourism destination and such developments can be seen in this area, with the expansion of resorts and private residences encouraged by local and international land ownership. (15) Since the 1970s, the area has also been popularly used for research and educational facilities.⁹, providing both local and international students with opportunities to conduct short and long-term research within the area.

⁷ Queen Conch: *Strombus gigas*

⁸ Caribbean spiny Lobster: *Panulirus argus*

⁹ Carrie Bow Caye has been leased since 1972 by the Smithsonian Institute.

Management

The BFD is the principal governing agency regulating the marine resources in the SWCMR. This regulatory body oversees the fishing industry, maintains sustainable fish stocks, and protects this area's marine and freshwater environments. In managing the marine resources within the SWCMR, the BFD ensures the sustainable use and conservation of its diverse ecosystems. Through a comprehensive management framework, the department implements regulations, conducts monitoring and enforcement activities, and collaborates with stakeholders to safeguard the reserve's ecological integrity. The department also enforces zoning, seasonal closures, and size limits to regulate fishing activities and protect critical habitats, including coral reefs, seagrass beds, and mangrove forests. The BFD also conducts research and data collection to assess the health of marine populations and ecosystems to inform adaptive management strategies and conservation priorities. The department plays a crucial role in preserving the biodiversity and productivity of the SWCMR, ensuring its continued resilience and contribution to Belize's marine heritage.

2.4.4. PORT HONDURAS MARINE RESERVE

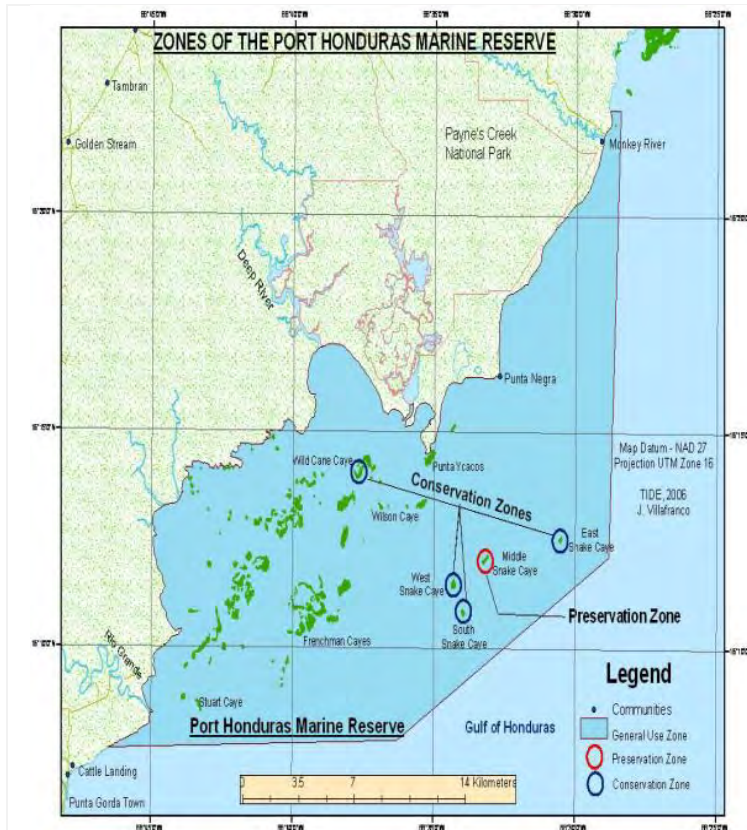


Figure 4: Port of Honduras Marine Reserve zones (Source: Belize Fisheries Department) (18)

Details	
Name	Port of Honduras Marine Reserve
Established	2000 (SI9 of 2000)
Location	Port Honduras Marine Reserve is located directly offshore, in the coastal waters of southern Belize, extending from Monkey River at its northern extent to beyond the Rio Grande in the south.
Total Area	100,078 acres
Coordinates:	328187 E; 1792875 N
General Use Zone:	93,731, acres (37,932 ha) 95%
Preservation Zone:	Approx 0.805km radius around Middle Snake Cayes (1%)
Conservation Zone:	0.805km radius around West and South Snake Cayes, East Snake Caye and Wild Cane Caye (4%)
Administrator:	Belize Fisheries Department
Comanager:	Toledo Institute for Development and Environment (TIDE)
Communities	Monkey River, Punta Gorda, Punta Negra Baranco, Cattle Landing, Yemeri Grove, and Forest Home
Uses	Extractive and non-extractive – commercial artisanal, subsistence, sports or recreational fishing, tourism, education and research

Key Features and Attributes of the Port of Honduras Marine Reserve (Source: TIDE)

<ul style="list-style-type: none"> ○ Biodiversity Hotspot: PHMR is situated near the Mesoamerican Reef, the second-longest contiguous reef system in the world. As a result, the reserve is a biodiversity hotspot, supporting a rich array of marine life, including numerous species of corals, fish, and other marine organisms. 	<ul style="list-style-type: none"> ○ Three primary vegetation types: coastal and tidal wetlands, marine lagoons, and mangrove islands with associated shallow banks and fringing coral reefs. ○ Two different finfish populations have been identified in Port Honduras Marine Reserve - near-shore estuarine species and those associated with the reef. 	<ul style="list-style-type: none"> ○ Fisheries: PHMR supports local and national fisheries by providing substantial breeding and feeding grounds for commercially valuable species. Traditional fishing communities rely on the reserve for their livelihoods, contributing to the local economy. ○ Livelihoods: Supports the livelihood of critical coastal communities (particularly Punta Gorda, Punta Negra, and Monkey River)
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<ul style="list-style-type: none"> ○ Reef Systems: PHMR is home to various reef systems, including inshore, patch, and fringing reefs. These reefs provide essential habitat for many marine species, including corals, fish, and invertebrates. 	<ul style="list-style-type: none"> ○ Mangrove Cayes: The reserve contains 138 mangrove cayes, which serve as substantial breeding and nursery grounds for numerous marine species and play a crucial role in shoreline stabilisation, water filtration, and providing habitat for numerous marine species. 	<ul style="list-style-type: none"> ○ Tourism: The reserve attracts tourists interested in ecotourism activities such as snorkeling, diving, bird watching, and sports fishing. Tourism generates income for local businesses and communities, supporting economic development.
<ul style="list-style-type: none"> ○ Coral Species: 61 stony coral species have been observed in the waters of Belize, with eight unusual coral sightings on the reefs of the Snake Cayes. Coral reefs are among the most productive habitats, producing 2,000 decagrams of carbon per square meter per year 	<ul style="list-style-type: none"> ○ Maya Mountain Marine Corridor: PHMR is an integral part of the Port Honduras Marine Reserve, forming part of the eastern-most component of the Maya Mountain Marine Corridor (MMMC) and serving as the vital link between terrestrial protected areas and upland watersheds and the coastal and marine ecosystems 	<ul style="list-style-type: none"> ○ Coastal Protection: intact mangroves along the coastline provide natural protection against coastal erosion and storm surges, protecting nearby communities from the impacts of Climate Change and extreme weather events.
<ul style="list-style-type: none"> ○ Seagrass Beds: Seagrass beds are another vital PHMR ecosystem component. These underwater meadows provide habitat for many marine organisms, including juvenile fish and sea turtles. They also help stabilise sediments and improve water quality. 	<ul style="list-style-type: none"> ○ Cultural Heritage: The marine reserve holds cultural significance for indigenous communities and is a source of traditional knowledge and practices related to marine resource management. 	<ul style="list-style-type: none"> ○ No-take zones and marine protected areas provide refuge for species to reach maturity and reproduce, thus contributing to the population.
<ul style="list-style-type: none"> ○ Critical Nursery Habitat: The reserve is a critical nursery habitat for reef fish and other marine species, including the West Indian manatee. Its protected waters provide a haven for juvenile fish to grow and develop before venturing into the open ocean. 	<ul style="list-style-type: none"> ○ Ecosystem Services: The reserve offers important ecosystem services, including coastal protection, nutrient cycling, and carbon sequestration. These services are vital for maintaining the health and resilience of coastal ecosystems and supporting local livelihoods. 	<ul style="list-style-type: none"> ○ Education and Research: PHMR provides opportunities for scientific research and environmental education, contributing to our understanding of marine ecosystems and the importance of conservation.

Area & Location

The PHMR was established in 2000 and is co-managed by the Toledo Institute of Development and Environment (TIDE). (19) Its southern boundary is located 5 miles north of Punta Gorda. It encompasses 405 square kilometers or 100,078 acres. Near the Mesoamerican Reef, the second longest contiguous reef in the world, PHMR plays a vital role in protecting the biodiversity and integrity of this complex and beautiful system by providing critical nursery habitat for reef fish.

Features and Attributes

An integral part of the Maya Mountain Marine Corridor (MMMC), the PHMR encompasses an array of vital habitats, with inshore, patch and fringing reefs, seagrass beds and 138 mangrove cayes, supporting an essential fishery for local traditional users. (20) In fact, PHMR supports numerous threatened and critical commercial species, such as the Spiny Lobster, Queen Conch, West Indian Manatee, Great Hammerhead Shark, Hawksbill, Green and Loggerhead Turtles and Goliath Groupers. The coastal mangroves between Deep River and

Punta Y'Cacos are considered one of the remaining three principal nursery grounds for the Goliath Grouper. (20)

**Communities
Adjacent**

Several southern coastal communities, including Baranco, Cattle Landing, Yemeri Grove, Forest Home, Monkey River, Punta Gorda, and Punta Negra, largely depend on PHMR for their livelihoods. The village of Punta Negra has experienced a notable household decline from 40 to 9 households since the establishment of PHMR in 2000. Studies revealed that most of the population loss stemmed from fishers' migration to urban areas to seek alternative incomes. (20)

Management

The Government of Belize has granted TIDE co-management responsibility of the PHMMR in partnership with the BFD. TIDE manages the multiple-use areas based on a zoning system that fosters community-based marine and coastal conservation, all the while educating and building awareness and developing viable economic alternatives for residents of communities buffering or adjacent to the reserve. Since 2003, TIDE has been monitoring the marine habitats and species within the PHMR, collecting, and analysing data to improve the area's management. TIDE was instrumental in piloting Managed Access Fisheries in July 2011 in response to increasing fishing pressures on a decreasing resource base. (20) PHMR aims to maintain coastal ecosystem functions and natural resource values, including water quality and nursery habitats, to protect the biodiversity in the reserve and the livelihoods of traditional fishers. The socioeconomic activities in the PHMR are mostly ecotourism, which includes commercial fishing, recreational fishing, sports fishing, bird watching and snorkeling.

2.4.5. TURNEFFE ATOLL MARINE RESERVE

TURNEFFE ATOLL MARINE RESERVE ZONING MAP		DETAILS			
<p>Turneffe Atoll Marine Reserve</p> <p>Management Zones</p> <ul style="list-style-type: none"> Zone I- Mauge Caye Conservation Zone Zone IIA- Dog Flea and Black Bird Caye Conservation Zone Zone IIB- Cockroach-Grassy Caye Special Management Zone Zone III- Vincent's Lagoon Special Management Area Zone IV- Calabash Reef Conservation Zone Zone V- Long Bogue Conservation Zone Zone VI- Caye Bokel Conservation Zone Zone VII- Preservation Zone Zone VIII- General Use Zone <p> ■ Spawning Aggregation Site </p> <p style="text-align: center;">Approximate Scale</p> <p>0 2.5 5 10 Miles</p> <p>0 3.75 7.5 15 Kilometers</p> <p style="text-align: right; font-size: small;">Earthstar Geographics</p>		Name Turneffe Atoll Marine Reserve	Established 2012 (SI-105 of 2012)		
		Location 32km (20 miles) east of Belize City, southeast of Ambergris Caye and Caye Caulker.	Total Area Approximately 148,981 hectares or 368,140 acres (1,489.8 square kilometers)		
		Coordinates Latitude 17.3317° N, Longitude 87.7779° W	General Use Zone Area: Approx 106,321.1 hectares (1,063.2 square kilometers) Size: Approximately 60% of the total area		
		Conservation Zone		Conservation Zones total area is approximately 36,660.34 hectares (36,660.34 square kilometers). This area comprises the following conservation zones: <ul style="list-style-type: none"> • Zone I: Mauge Caye Conservation Zone is approx. 4,109.3 hectares (41.1 square kilometers). • Zone II: Dog Flea Caye and Black Bird Caye Conservation Zone is approx. 25,375.8 hectares (253.7 square kilometers), • Zone II-B: Cockroach-Grassy Caye Special Management ARE: 888.0 hectares (8.9 square kilometers). • Zone IV: Calabash Reef Conservation Zone is approx. approximate area of 164.6 Hectares (1.6 square kilometers) • Zone V: Long Bogue Conservation Zone is approx. 891.840 hectares (8.9 square kilometers) • Zone VI: Caye Bokel Conservation Zone is approx. 5,230.8 hectares (52.3 square kilometers) 	
		Preservation Zone	Zone VII: Preservation Zone is approximately 1,480.8 hectares (14.8 square kilometers). Size: Approximately 20% of the total area	Special Management Zone	Zone III: Vincent's Lagoon Special Management Area has approximately 2600.6 hectares (26.0 square kilometres).
Administrator	Belize Fisheries Department	Comanager	Turneffe Atoll Sustainability Association (TASA)		

Figure 5: Turneffe Atoll Zoning Map (Source: TASA)

Communities	Belize City, Caye Caulker, Hopkins, Placencia, San Pedro, Sarteneja, 25 seasonal fishing camps, one scientific research station and three resorts.	Uses	Extractive and non-extractive – commercial artisanal, subsistence, sports or recreational fishing, tourism, education and research
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Area & Location

The Turneffe Atoll Marine Reserve (TAMR) is a cornerstone of Belize's marine conservation initiatives, representing a critical habitat for biodiversity and a key site for scientific research and sustainable management practices in marine ecosystems. Located approximately 32 kilometers (20 miles) from Belize City, TAMR encompasses an impressive approximate area of 148,981 hectares (1,489.8 square kilometers), equivalent to approximately 368,140 acres.

Features and Attributes

TAMR encompasses diverse physical features contributing to its ecological richness and biodiversity, as seen in **Tables 1 and 2**. It is a vast and diverse marine ecosystem which includes expansive flats, intricate creeks, and serene lagoons, all interconnected by a labyrinth of waterways. Above the azure waters rise over 450 mangrove islands and elevated cayes adorned with savannas and littoral forests for immense natural beauty and ecological richness.

TAMR is characterised by its atoll structure, consisting of a circular coral reef surrounding a central lagoon. This expansive marine reserve contains vibrant coral reefs, mangrove islands, seagrass beds, and lagoons, providing habitat for many marine species. The atoll's diverse habitats support a wealth of marine life, including coral formations, manatees, sea turtles, and many fish species. The reserve's pristine habitats provide vital breeding grounds, nurseries, and feeding areas for many marine creatures, contributing to the region's extraordinary biodiversity and ecological resilience. TAMR also features underwater pinnacles, marine caves, blue holes, and tidal flats, which make for unique diving and snorkeling experiences and wildlife observation. (15)

The marine reserve is pivotal in supporting socioeconomic development and promoting sustainable livelihoods for users from the nearest communities. TAMR natural wonders are the sources of income and employment in various sectors, including nature-based tourism, fishing, and conservation management.

- **Tourism Sector:** Through responsible tourism initiatives, TAMR attracts visitors worldwide, contributing to the local economy through revenue generation for businesses, accommodations, and services. It plays a vital role in Belize's fishing sector by serving as a crucial nursery, breeding ground, and habitat for numerous commercially important fish species.
- **Fisheries Sector:** The Turneffe Atoll Marine Reserve (TAMR) provides invaluable support to Belize's fishers by serving as a sustainable fishing area.
- **Conservation management:** As one of Belize's largest and most biodiverse marine reserves, TAMR supports the replenishment of fish stocks owing to the healthy of its marine ecosystems, which are essential for sustaining fisheries productivity. By safeguarding critical habitats such as coral reefs, mangrove forests, and seagrass beds, TAMR helps to mitigate overfishing pressures and habitat degradation. Additionally, TAMR promotes responsible tourism and fishing practices through regulations and enforcement measures, fostering a balanced approach to marine resources management that prioritises conservation and sustainable use. (17)

Table 3: Key Features and Attributes of the Turneffe Atoll Marine Reserve (Source: Turneffe Atoll Management Plan)

Key Physical Features of the Turneffe Atoll Marine Reserve (Source: TASA)		
<p>Atoll Structure: TAMR is characterised by its atoll structure, which consists of a circular or oval-shaped coral reef encircling a central lagoon. This unique geological formation provides diverse habitats for marine life and contributes to the resilience of the ecosystem.</p>	<p>Coral Reefs: The marine reserve is home to extensive coral reef systems, including fringing reefs, barrier reefs, and patch reefs. These coral formations support diverse marine species and provide essential habitat, protection, and feeding grounds for reef-associated organisms.</p>	<p>Mangrove Islands: TAMR features over 450 mangrove islands scattered throughout its waters. These mangrove habitats play a crucial role in shoreline stabilisation, sediment trapping, and nutrient cycling while serving as substantial breeding and nursery grounds for fish, crustaceans, and birds.</p>
<p>Lagoons and Creeks: Within TAMR, shallow, calm waters and intricate channels characterise numerous lagoons and creeks. These areas provide refuge for juvenile marine life, including fish and invertebrates, and serve as feeding and resting places for various species.</p>	<p>Flats: The marine reserve encompasses expansive flats and shallow sandy or seagrass-covered seabed areas. Flats are essential feeding grounds for many marine species, including bonefish, permit, and tarpon, making them popular destinations for recreational anglers and fly fishermen.</p>	<p>Elevated Cayes: Scattered throughout TAMR are elevated cayes, small islands formed from coral rubble and sand. These cayes are often covered with vegetation, including savanna and littoral forest, and provide nesting sites for seabirds such as boobies, frigatebirds, and terns.</p>
<p>Seagrass Beds: TAMR contains extensive seagrass beds, which are critical habitats for a variety of marine organisms, including sea turtles, manatees, and juvenile fish. Seagrass meadows also play a crucial role in carbon sequestration and sediment stabilisation.</p>	<p>Deep Channels: Surrounding the atoll are deep channels that connect the central lagoon to the open ocean. These channels serve as pathways for nutrient-rich waters, oceanic currents, and migratory species, contributing to the overall health and productivity of the marine ecosystem.</p>	<p>Blue Holes: TAMR features several blue holes, underwater sinkholes formed by the collapse of limestone caves. These geological formations provide unique habitats for deep-sea organisms and are popular destinations for divers seeking to explore their depths.</p>
<p>Barrier Islands: Along the eastern edge of TAMR are barrier islands, narrow strips of land that protect the atoll from the open ocean. These islands provide habitat for terrestrial wildlife and help buffer the atoll from storm surges and wave action.</p>	<p>Marine Caves and Overhangs: Within TAMR, the erosive force of waves and currents carves out numerous marine caves and overhangs. These formations provide shelter for various marine species, including fish, crustaceans, and octopuses, and are popular sites for divers to explore.</p>	<p>Coral Gardens: TAMR is adorned with vibrant coral gardens characterised by clusters of coral colonies in a kaleidoscope of colours and shapes. These gardens are biodiversity hotspots, supporting many reef-associated species, including fish, invertebrates, and algae.</p>
<p>Underwater Pinnacles: Rising from the depths of the ocean floor are underwater pinnacles, towering structures formed by ancient coral growth and geological processes. These pinnacles attract pelagic species such as sharks, rays, and large fish, making them prime locations for diving and wildlife encounters.</p>	<p>Tidal Flats: TAMR encompasses tidal flats and intertidal areas exposed during low tide and submerged during high tide. These flats are essential feeding grounds for shorebirds, wading birds, and crustaceans, supporting a diverse array of wildlife dependent on the ebb and flow of the tides.</p>	<p>Submerged Reef Structures: Beneath the surface of the water lie submerged reef structures, including bommies¹⁰, ridges, and spurs. These formations provide complex habitats for reef-dwelling organisms and contribute to the structural integrity of the coral reef ecosystem.</p>
<p>Sandbars and Shoals: TAMR features sandbars and shoals, shallow areas of sandy bottom that are exposed during low tide. These areas are frequented by foraging seabirds, feeding fish, and beachcombers, offering opportunities for wildlife observation and recreational activities.</p>	<p>Ephemeral Pools: During periods of low rainfall, ephemeral pools may form on the surface of elevated cayes and mangrove islands. These pools provide temporary habitats for aquatic organisms, including fish, crustaceans, and amphibians, adapting to the dynamic nature of the coastal environment.</p>	<p>Submerged Vegetation: Beneath the water's surface, submerged vegetation such as seagrasses and macroalgae thrive in the nutrient-rich waters of TAMR. These plants provide food, shelter, and oxygen for marine life, contributing to the overall productivity and health of the marine ecosystem.</p>

¹⁰ Bommies are an outcrop of coral reef, often resembling a column, that is higher than the surrounding platform of reef and which may be partially exposed at low tide.

Table 4: Critical Attributes of TAMR Source: Turneffe Atoll Management Plan)

Key Attributes of the Turneffe Atoll Marine Reserve		
<p>UNESCO World Heritage Site: TAMR holds the prestigious designation as a UNESCO World Heritage Site, recognising its outstanding universal value and contribution to global marine conservation efforts.</p>	<p>Rich Biodiversity: The reserve is home to an extraordinary diversity of marine life, including colorful coral formations, elusive manatees, graceful sea turtles, tropical fish species, and countless other flora and fauna, contributing to its ecological richness and significance.</p>	<p>Sustainable Management: Co-managed by the Turneffe Atoll Sustainability Association (TASA), TAMR is governed by a comprehensive management plan that promotes sustainable use, conservation, and responsible tourism practices and ensures the long-term health and vitality of the marine reserve.</p>
<p>Diverse Marine Habitats: TAMR boasts a diverse array of marine habitats, including expansive flats, intricate creeks, serene lagoons, vibrant coral reefs, and dense mangrove forests, providing refuge and sustenance for many marine species.</p>	<p>Coral Bleaching and Recovery Zones: TAMR includes zones designated for coral bleaching monitoring and recovery efforts in response to global climate change. These zones serve as focal points for scientific research, restoration projects, and adaptive management strategies to preserve coral reef resilience in the face of environmental stressors.</p>	<p>Scientific Research Opportunities: TAMR offers unique opportunities for scientific research and monitoring, facilitating studies on marine biodiversity, ecosystem dynamics, climate change impacts, and conservation management strategies, contributing valuable data and insights to global marine science efforts.</p>
<p>Sustainable Livelihoods: TAMR supports sustainable livelihoods for local communities engaged in fishing, tourism, and conservation activities. By promoting responsible management practices, the reserve helps safeguard traditional livelihoods while ensuring the long-term health of marine resources.</p>	<p>Employment Opportunities: The marine reserve generates employment opportunities for residents through various sectors, including eco-tourism, dive operations, boat charters, research, and conservation management. These jobs provide stable incomes and economic security for individuals and families living in nearby coastal communities.</p>	<p>Tourism Revenue: TAMR attracts visitors from around the world seeking unique eco-tourism experiences, including diving, snorkeling, birdwatching, and wildlife tours. The revenue generated from tourism activities contributes to the local economy, supporting businesses, accommodations, and services in nearby towns and villages.</p>
<p>Eco-Tourism Development: TAMR's presence has spurred the development of eco-tourism infrastructure and services, including eco-lodges, dive centres, tour operators, and guided excursions. These developments enhance the visitor experience while minimising negative environmental impacts and promoting sustainable tourism practices.</p>	<p>Cultural Preservation: TAMR promotes eco-cultural tourism initiatives to preserve the cultural heritage and traditions of local communities. Visitors learn about indigenous peoples' rich history, customs, and practices, fostering cross-cultural understanding and appreciation.</p>	<p>Ecological Resilience: By protecting critical habitats and species within its boundaries, TAMR enhances marine ecosystems' ecological resilience to environmental stressors such as climate change, pollution, and overexploitation. Healthy ecosystems provide essential ecosystem services, including carbon sequestration, coastal protection, and fisheries productivity.</p>

Communities Adjacent

There is no established community in the MPA; however, there are about 25 seasonal fishing camps and day-trip tourism operators in the area. The primary stakeholders of TAMR are community residents, fishers, and tourism-based personnel on the cayes and from the coastal communities on the mainland. The fishing communities that use this MPA are Belize City, Caye Caulker, Hopkins, Placencia, San Pedro, and Sarteneja and they mainly depend on the reserves' marine resources for commercial, artisanal, and traditional or subsistence fishing. There has been significant growth in the use of the area as a tourism destination over the last ten years. Additionally, the Environmental Research Institute, of the University of Belize, manages the Calabash Caye Field Station, and the Oceanic Society maintains a facility at Blackbird Caye. Three resorts also operate on the Atoll: Turneffe Flats, Turneffe Island Resort and Blackbird Caye. The Belize

Coastguard also maintains a manned station on Calabash Caye, and the Port Authority has lighthouses on Mauger Caye and Caye Bokel.

Management

Established in 2012 and bestowed with the esteemed recognition as a UNESCO World Heritage Site, the Turneffe Atoll Marine Reserve (TAMR) stands as a testament to the collaborative efforts of the Turneffe Atoll Sustainability Association (TASA) in championing conservation, sustainability, and responsible management. Co-managed by TASA, TAMR symbolises a harmonious balance between human activities and the preservation and delicate ecosystems.

In June 2010, the Turneffe Atoll Sustainability Council (TASC) was established, marking a pivotal step towards the sustainable management of Turneffe Atoll, facilitated by Turneffe Atoll Trust in collaboration with Coastal Zone Management Authority (CZMAI). This stakeholder-based organisation laid the foundation for the formalisation of Turneffe Atoll as a Marine Reserve in 2012, operating under the mandate of the Fisheries Act and the Fisheries Department. TAMR's management framework allows for zoned multiple uses, incorporating extractive use, conservation, and preservation zones.

TAMR is managed TASA through a multifaceted approach that encompasses sustainable socio-economic development, scientific research promotion, effective marine reserve management, and diligent monitoring and surveillance of activities to deter and mitigate harmful practices. TASA oversees all interactions within TAMR and ensures that these are conducted with utmost care to safeguard the atoll's ecological integrity for the enjoyment and benefit of future generations.

3. INSTITUTIONAL AND LEGAL FRAMEWORKS

According to the International Union for the Conservation of Nature (IUCN), a marine protected Area is a “clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.” (21) The Government of Belize established and designated thirty-three (33) MPAs, totaling approximately 4.118Km² (12%), towards marine protection and 34,312 Km² of marine area for economic and sustainable livelihood purposes. (21) The MPAs in the study area are part of the larger body of Belize’s marine protected areas and they are safeguards efforts for environmental protection and conservation and for socio-economic development. The overarching National Protected Areas Systems Act of 2015 substantively govern all MPAs¹¹. (22) In addition, three (3) of the targeted MPAs form part of the Belize Barrier Reef Reserve System (1996) inscribed as a UNESCO World Heritage Site in 1996.¹² (23)

3.1. NATIONAL LEGISLATION AND REGULATORY FRAMEWORKS

There are several legislations and policy frameworks that govern the protection, conservation, and sustainable management of marine resources, ecosystems, ecosystem services, and biodiversity. At the forefront of this regulatory landscape is the National Protected Areas System Act (2015), under which Belize has designated numerous marine protected areas to preserve critical habitats and biodiversity hotspots. Other legislative and policy instruments underscore Belize's commitment to balance the socio-economic benefits of its marine resources with the imperative of conservation. These include the Coastal Zone Management Act, which provides an overarching legal framework for integrated coastal zone management, guiding policies, and initiatives to safeguard Belize's coastal and marine environments. Additionally, the Fisheries Resources Act (2020) governs the sustainable use of fisheries resources, and the Environmental Protection Act (1992) addresses environmental impact assessments and pollution control measures. Other pertinent legislations that regulate marine biodiversity are the Fisheries Act (2000), the Forest Act (1927), the Wildlife Protection Act (1981), the National Integrated Water Resources Act (2011), the Mines and Minerals Act (1989) and the Petroleum Act (1991), and Belize Port Authority Act (2003).

These are some of the key legal frameworks that provide the basis for conducting marine socioeconomic monitoring in Belize's coastal communities and ensuring the sustainable management of marine resources and the well-being of local populations. Below is a summary list of pertinent legislations, policies, and regulations supportive of the conduct of socioeconomic monitoring.

¹¹ The NPASA provides for the maintenance of coordinated management of a system of protected areas that is representative of internationally agreed categories and provides substantive legal framework for MPAs to comply with national and international laws and best practices for conservation and sustainable development purposes.

¹² The three MPAs of the BBRRS are the Blue Hole Natural Monument, Halfmoon Caye Natural Monument and the South Water Caye Marine Reserve.

MARINE PROTECTED AREAS LEGISLATIONS

National Protected Areas System Act: This act establishes and manages marine protected areas and provides provisions for socioeconomic monitoring to assess the benefits and impacts of conservation efforts on local communities. Enacted in 1981 and subsequently amended in 1995, the Act provides the legal framework for establishing, managing, and regulating protected areas, including marine protected areas (MPAs), marine reserves, and natural monuments. Under this legislation, designated marine areas are subject to specific zoning and management plans to conserve biodiversity, protect critical habitats, and promote sustainable use of marine resources. It empowers the GoB to enact regulations, enforce compliance, and collaborate with stakeholders to ensure the adequate protection and management of marine ecosystems, fisheries, and coastal communities. By integrating conservation objectives with socio-economic considerations, the act reinforces Belize's commitment to sustainable development and the preservation of its rich marine biodiversity for future generations.

Socioeconomic Monitoring:

Belize's National Protected Areas System Act mandates socioeconomic monitoring as an integral component of its conservation and management of marine resources. Recognising the interconnectedness between human well-being and environmental conservation, the NPASA requires regular monitoring of socio-economic indicators within marine protected areas to assess the impacts of conservation measures on local communities, livelihoods, and cultural practices. The NPASA enables policymakers, managers, and stakeholders to make informed decisions, evaluate management effectiveness, and address emerging challenges by systematically collecting data on factors such as employment, income, resource use, and community perceptions.

FISHERIES LEGISLATION

Fisheries Act (Chapter 210 of the Laws of Belize Revised Edition 2000): This legislation governs the management, conservation, and sustainable use of fisheries resources in Belizean waters. It establishes the regulatory framework for licensing, fishing practices, catch limits, and enforcement measures to ensure the sustainable exploitation of marine resources.

Fisheries Regulations (Statutory Instrument No. 41 of 2012): These regulations provide detailed provisions for implementing the Fisheries Act, including rules on gear restrictions, protected areas, closed seasons, and prohibited activities.

Fisheries Resources Act of Belize (2020): This comprehensive legislative framework was enacted to regulate and manage the fisheries resources. Under the Fisheries Resources Act (FRA), licensing requirements, catch limits, gear restrictions, and conservation measures are established to promote responsible fishing practices and prevent overexploitation of fish stocks. The act also provides for establishing marine protected areas, closed seasons, and no-take zones to safeguard critical habitats and breeding grounds. Additionally, the act empowers enforcement agencies, such as the BFD, to monitor and enforce compliance

Socioeconomic Monitoring: In addition to regulating and managing fisheries resources sustainably, these legislations also include provisions for socioeconomic monitoring of fishing activities, employment in the fisheries sector, and the contribution of fisheries to local economies.

with fisheries regulations, thereby deterring illegal fishing activities and promoting the long-term sustainability of this sector.

TOURISM LEGISLATIONS

Belize Tourism Board Act (Chapter 225 of the Laws of Belize Revised Edition 2000): This legislation establishes the Belize Tourism Board (BTB) as the statutory body responsible for regulating, promoting, and developing tourism in Belize. It sets out the legal framework for licensing, standards, and guidelines for tourism operators, including those operating within or adjacent to marine protected areas.

Environmental Protection Act (Chapter 328 of the Laws of Belize Revised Edition 2000): While not specific to tourism, this act provides the legal basis for environmental impact assessments (EIAs) and environmental regulations that may affect tourism development projects, including those in coastal and marine areas.

Socioeconomic Monitoring: The regulations stipulate requirements for socioeconomic monitoring to assess the impacts of aquaculture activities on coastal communities, livelihoods, and economic development. Socioeconomic monitoring may include assessments of employment opportunities generated by aquaculture operations, income levels of workers, contributions to local economies, and social dynamics within coastal communities.

AQUACULTURE LEGISLATION

Aquaculture Act (Chapter 210 of the Laws of Belize Revised Edition 2000): This legislation regulates the development and management of aquaculture activities in Belizean waters, including coastal and marine areas. It provides the legal framework for licensing, site selection, environmental standards, and monitoring of aquaculture operations to ensure sustainability and minimise impacts on marine ecosystems.

Aquaculture Regulations (Statutory Instrument No. 34 of 2003): These regulations supplement the Aquaculture Act by specifying detailed requirements and procedures for aquaculture development, including permits, environmental assessments, and operational standards.

Socioeconomic Monitoring: Aquaculture legislation promotes socioeconomic monitoring as a fundamental aspect of its regulatory framework to ensure sustainable aquaculture practices maximise the socio-economic benefits for local communities. This legislation establishes mechanisms for monitoring and evaluating aquaculture activities' social and economic impacts, including employment generation, income generation, and community development. This enables authorities to assess the sector's contributions to national development goals, identify potential risks or conflicts, and inform policy decisions to optimise socio-economic outcomes and inclusivity in the management of aquaculture activities, promoting sustainable growth and resilience in Belize's aquaculture sector.

COASTAL LEGISLATION

DEVELOPMENT

Socioeconomic Monitoring: The Coastal Zone Management Act (1998)

Coastal Zone Management Act (Chapter 329 of the Laws of Belize Revised Edition 2000): This legislation establishes the legal framework for the integrated management and sustainable development of Belize's coastal zone, including marine protected areas. It provides for establishing Coastal Zone Management Authorities (CZMAs) and Coastal Zone Management Plans (CZMPs) to guide development activities, regulate land use, and protect coastal resources.

provides the legal framework for integrated coastal zone management, including provisions for monitoring socioeconomic activities in coastal communities and assessing their impacts on marine resources and ecosystems.

Environmental Impact Assessment Regulations (Statutory Instrument No. 23 of 1995): These regulations require developers to conduct environmental impact assessments (EIAs) for proposed projects in coastal and marine areas to assess potential environmental impacts and mitigate adverse effects on marine ecosystems and biodiversity.

Socioeconomic Monitoring: Addresses EIAs and pollution control measures; the legislation also requires monitoring of socioeconomic impacts associated with coastal development projects and industrial activities

3.2. INTERNATIONAL COMMITMENTS

In addition to these national legislations, Belize also adheres to international conventions and agreements related to marine conservation and sustainable development, including the Convention on Biological Diversity (CBD) 1992, the United Nations Convention on the Law of the Sea (UNCLOS) 1982, and the Ramsar Convention on Wetlands. Belize is also a party to the Trade in Endangered Species (CITES) Bill 2022, the High Seas Fishing Act 2013, and other international conventions and treaties such as the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena de Indias, Colombia, 1983), Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972), and the International Convention for the Protection and Conservation of Sea Turtles for the Western Hemisphere (December 21st, 1997). These agreements provide the global commitments from which localised efforts may be derived to protect the marine environment and promote sustainable livelihoods. Some of the key international frameworks to which Belize is a party, with pertinence to this study are detailed below.

Convention on Biological Diversity (CBD), signed in 1992.

Belize is a signatory to the CBD, an international treaty that aims to conserve biodiversity, promote sustainable use of natural resources, and ensure equitable sharing of benefits derived from genetic resources. The CBD provides a framework for countries to develop national biodiversity strategies and action plans, implement measures for the conservation of marine biodiversity, and establish protected areas, including marine protected areas.

Socioeconomic Monitoring: CBD calls for the monitoring and assessment of the social, economic, and cultural impacts of biodiversity conservation measures, including those related to marine ecosystems and coastal communities.

United Nations Convention on the Law of the Sea (UNCLOS), signed in 1983

Belize is a party to UNCLOS, a comprehensive international treaty that governs all aspects of ocean governance, including maritime boundaries, navigation, conservation, and resource

Socioeconomic Monitoring: UNCLOS establishes the legal framework for governing ocean resources and protecting the marine environment, emphasizing the

management. UNCLOS establishes the legal framework for the protection and sustainable use of marine resources within Belize's Exclusive Economic Zone (EEZ) and the rights and obligations of coastal states and other stakeholders in marine environments.

importance of monitoring socioeconomic activities in coastal areas.

Ramsar Convention on Wetlands, signed in 1996

Belize is a signatory to the Ramsar Convention, an international treaty emphasising the conservation and wise use of wetlands, including coastal and marine wetlands. The Ramsar Convention provides a framework for the designation and management of wetlands of international importance, including mangroves, estuaries, and coastal lagoons, which are vital habitats for marine biodiversity and ecosystem services.

Socioeconomic Monitoring: The Ramsar Convention encourages monitoring socioeconomic values associated with wetland ecosystems, including coastal mangroves and estuaries, and their contributions to local livelihoods and well-being.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), signed in 1990

Belize is a party to CITES, an international agreement that regulates the international trade in endangered species to ensure their survival and prevent illegal trafficking. CITES lists species subject to trade restrictions or requiring permits for import and export, including marine species such as corals, sea turtles, and certain species found in Belizean waters.

Socioeconomic Monitoring: CITES calls for the monitoring of socioeconomic impacts of international trade in marine species to ensure their sustainable use and conservation

World Heritage Convention, signed in 1981.

Belize is a signatory to the World Heritage Convention, which aims to protect and preserve natural and cultural heritage of outstanding universal value. Belize's Barrier Reef Reserve System, which includes the Belize Barrier Reef and seven marine protected areas, is a UNESCO World Heritage Site designated for its exceptional biodiversity and ecological significance.

Socioeconomic Monitoring: While the convention primarily focuses on conserving these sites, it also recognises the importance of understanding and monitoring their socioeconomic dynamics. Specifically, the convention urges member states to conduct socioeconomic monitoring to evaluate the benefits and impacts of conservation measures on local communities, livelihoods, and cultural practices.

Intergovernmental Panel on Climate Change (IPCC) Guidelines

The Intergovernmental Panel on Climate Change (IPCC) Guidelines are authoritative documents that provide comprehensive guidance on assessing and addressing climate change impacts, vulnerabilities, and adaptation options. Developed through collaboration between scientists, policymakers, and experts worldwide, these guidelines serve as a vital resource for policymakers, practitioners, and stakeholders involved in climate change mitigation and adaptation efforts. The IPCC Guidelines cover various topics, including methodologies for greenhouse gas inventories, climate change impacts and vulnerability assessments, and adaptation planning and implementation. By providing standardised approaches and best practices for climate-related assessments, the IPCC Guidelines

Socioeconomic Monitoring: IPCC guides socioeconomic monitoring in coastal areas to assess vulnerability, adaptation, and resilience to climate change impacts on marine ecosystems and coastal communities.

help ensure consistency and comparability across different regions and sectors, facilitating informed decision-making and effective climate action at local, national, and global levels.

Convention for the Elimination of all Forms of Discrimination against Women (CEDAW)

As Belize is a signatory to the Convention for the Elimination of all Forms of Discrimination against Women (CEDAW), monitoring community-level interventions and instituting policies and programs to ensure that women benefit equally from marine resources strengthens the commitment of the state generally to advance the rights of women by eliminating exclusionary social and economic practices that further marginalises them and their households.

CEDAW mandates state parties to engage with civil society organisations and women's rights advocates in monitoring efforts, promoting transparency, accountability, and participatory approaches to achieving gender equality. Through its emphasis on socioeconomic monitoring, CEDAW reinforces the commitment of state parties to uphold women's rights as human rights and advance towards inclusive and sustainable development.

Socioeconomic Monitoring: CEDAW

incorporates socioeconomic monitoring as a critical mechanism for advancing gender equality and women's empowerment. State parties are obligated to monitor and evaluate the implementation of measures to eliminate discrimination against women in all spheres of life, including socio-economic domains. This entails collecting and analysing data on critical indicators such as education, employment, health, access to resources, and participation in decision-making processes. By systematically monitoring progress and identifying gaps or disparities, CEDAW facilitates evidence-based policymaking, advocacy, and resource allocation to address systemic barriers and ensure equal opportunities for women and girls.

Convention on Economic, Social and Cultural Rights (CESCR)

Belize ratified the Convention on Economic, Social, and Cultural Rights (CESCR), which consists of international legal provisions establishing economic, social and cultural rights, including rights relating to an adequate standard of living. Where marine resources provide for income generation and livelihood as well as social and cultural protection, the monitoring of the status of these entitlements in communities adjacent to or that impact marine protected areas helps to ensure that environmental protection and conservation are managed in a balanced manner so that the natural resources are used sustainably for the economic livelihood and social benefits of residents.

Socioeconomic Monitoring: CESCR

incorporates socioeconomic monitoring by requiring state parties to systematically assess and address the realisation of economic, social, and cultural rights through data collection, analysis, and evaluation of key indicators such as employment, education, healthcare, and standard of living.

Free Prior and Informed Consent (FPIC)

Free, Prior, and Informed Consent (FPIC) is a fundamental principle recognised by the Food and Agriculture Organization (FAO) that safeguards the rights of indigenous peoples and local communities in decision-making processes that affect their lands, territories, and natural resources. FPIC requires that these communities be fully informed about proposed projects or activities, given adequate time to consider the potential impacts and have the opportunity to provide their consent or refusal without coercion or intimidation. FPIC aims to ensure meaningful participation, respect for traditional knowledge and cultural practices, and the protection of indigenous rights to self-determination and territorial sovereignty in accordance with international human rights standards and indigenous rights frameworks.

Socioeconomic Monitoring:

Implementing FPIC principles within coastal and marine communities catalyses the establishment of robust socioeconomic monitoring systems. As part of this process, comprehensive socioeconomic monitoring becomes imperative, enabling stakeholders to assess the potential impacts of proposed initiatives on livelihoods, cultural practices, and community well-being. By incorporating FPIC into monitoring frameworks, coastal and marine communities gain greater agency and control over the development of activities in their areas, ensuring that their rights, needs, and aspirations are respected and prioritised.

Belize is a party to these international frameworks and agreements and is committed to global efforts to conserve marine biodiversity, protect marine ecosystems, and promote sustainable development in coastal and marine environments. These agreements provide essential guidelines and standards for Belize's marine conservation and management initiatives while fostering international cooperation and collaboration on marine issues.

3.3. NATIONAL STRATEGIES & ACTION PLANS

The conduct of socioeconomic monitoring in the five (5) MPAs also contributes to advancing national development priorities for economic growth, and the social development and well-being of all who live in Belize. As such, the programs, strategies and projects resulting from monitoring in the five MPAs can count towards the targets established in national and development priorities.

National Medium-term Development Strategy (MTDS, 2022 – 2026)

The **National Medium-term Development Strategy (MTDS, 2022 – 2026)** sets the development priorities and trajectories that the Government of Belize, through the various ministries, is pursuing to improve the living conditions in the country. At the core of the nine (9) strategic development initiatives of the MTDS lies the principle of socioeconomic justice by which leadership and management of the related programs will be guided. Monitoring the socioeconomic conditions and the subsequent development of projects and programs by managers of MPAs can directly contribute to advancing this national strategy.

Belize National Biodiversity Strategy

Belize National Biodiversity Strategy and Action Plan (NBSAP), developed in support to the Convention on Biological Diversity

**and Action Plan
(NBSAP) (2015-2025)**

(CBD), sets out a comprehensive framework for the conservation and sustainable use of Belize's biodiversity. It identifies targets and actions to address national and international priorities, such as protecting critical habitats, enhancing ecosystem services, and promoting community-based conservation initiatives.

**Belize National
Fisheries Policy and
Strategic Plan (2019-
2029)**

Belize National Fisheries Policy and Strategic Plan (2019-2029) is a policy document developed by the Fisheries Department, outlining the strategies and interventions for the sustainable management of Belize's fisheries resources. This plan aligns with national and international development priorities, including poverty reduction, food security, and livelihood enhancement, while promoting ecosystem-based approaches and sustainable fishing practices.

**Belize National
Climate Change
Policy and Action
Plan (2018-2030)**

The **Climate Change Policy and Action Plan**, developed by the Ministry of Sustainable Development, Climate Change, and Disaster Risk Management, sets a roadmap for climate resilience and low-carbon programming in Belize. It integrates national and international priorities, including adaptation and mitigation measures, disaster risk reduction, and sustainable land and water management.

**Marine Protected
Areas Management
Plans¹³**

The MPA management plans outline strategies for the conservation and sustainable management of critical marine ecosystems. These align with national priorities, including marine protected area management, sustainable tourism development, and community engagement, while addressing international goals for biodiversity conservation and ecosystem resilience. The management plans and strategies help to operationalise Belize's commitment to addressing national and global development priorities that promote sustainable development and advance the long-term health and resilience of biodiversity and natural marine resources. The MPAs of this study each have their respective management plans, including the South Water Caye Marine Reserve Management Plan 2019-2023 (24), Turneffe Atoll Marine Reserve Management Plan 2019-2023 (25) (26), Lighthouse Reef Atoll Management Plan, and the Port Honduras Marine Reserve Management Plan 2017-2021 (27) (28).

¹³ All MPAs are expected to develop and execute a management plan for the area under their co-management agreement with the Government of Belize.

4. METHODOLOGY

The socio-economic study employed surveys, focus group discussions (FGDs), and interviews with key informants. The respondents were members of households, fishermen, and employees in the tourism sector who interacted with the MPAs of the study area. The study steering committee (SC) supported the selection of the respondents, especially for the FGDs and key informant interviews. All survey respondents were residents of the 21 communities aligned to the study.

4.1. SAMPLE DESIGN

The survey was designed using the purposive sampling technique, also known as judgment, selective, or subjective sampling. This technique was chosen since only a small population sample could serve as the primary data sources in the study area communities. Furthermore, this technique was used owing to the flexibility it provided the researcher to collect as much data from an otherwise highly mobile target population. The SC assisted in identifying survey respondents, key informants, and FGD participants from the study's communities. As the survey was conducted during the busy tourism season and seafood harvesting periods, the surveyors relied on an internally created telephone directory comprising a contact list of community residents, official tour guides, fisherfolk, and association members of fisheries and tourism organisations to execute the survey. A total of 378 surveys were completed between October – November 2023.

4.2. KEY VARIABLES DETERMINATION

The research team submitted the existing variables for the SocMon, since this study would establish baseline socio-economic information and data for the target communities.

4.3. SURVEY INSTRUMENTS

The survey instruments were developed for three cluster groups: household members, tourism workers, professionals or business owners, and fishermen. Each questionnaire was divided into major thematic sections: *demographics, income, material lifestyle, awareness and perception, coastal and marine activities and practices, and communication preferences*. The primary difference between the three survey instruments was the "Coastal and Marine Activities" section, which tailored the questions to the specific cluster group.

The survey questions were created based on the SocMoN guidelines. From the pre-developed SocMon questions, the Steering Committee selected the key variables for gathering information from the twenty-one communities. Based on these variables, questions were identified and classified for each sub-topic of the study. The questions used were structured and closed-ended to facilitate quantitative data collection for basic statistical analysis. Open-ended semi-structured questions were also included to collect more data on some variables. The Likert Scale was used for response options, complemented with "none" and "other". "Don't know" was also a response option in the survey. Follow-up questions were not required if the initial question was answered

as "no." Open-ended questions were also used and these allowed respondents to offer their opinions and observations.¹⁴

4.4. FOCUS GROUP DISCUSSIONS

In addition to the survey, four (4) focus group discussions were conducted in Belize City, Dangriga and Punta Gorda. One Belize City FGD had mostly northern representatives, and the Dangriga focus group was for females only. The questions asked in the FGDs were selected from the pre-determined SocMon¹⁵ questions, which were also aligned with the indicators selected by the members of the SC.

4.5. KEY INFORMANTS' INTERVIEWS

Twenty-one (21) key informants were interviewed, guided by the recommendations of the members of the SC also identified by the SC. As with the FGDs, the questions asked to the key informants were based on the pre-defined questions from the SocMon methodology and guidance tools.

¹⁴ This script introduced the surveyor and the research lead, outlined the purpose of the survey, explained its ethical standards, invited the respondents to participate, and provided an opportunity for respondents to give passive consent.

¹⁵ The SocMon Methodology includes pre-determined questions that accompany each indicator. For this research study, the most relevant questions were selected by the steering committee.

5. FINDINGS

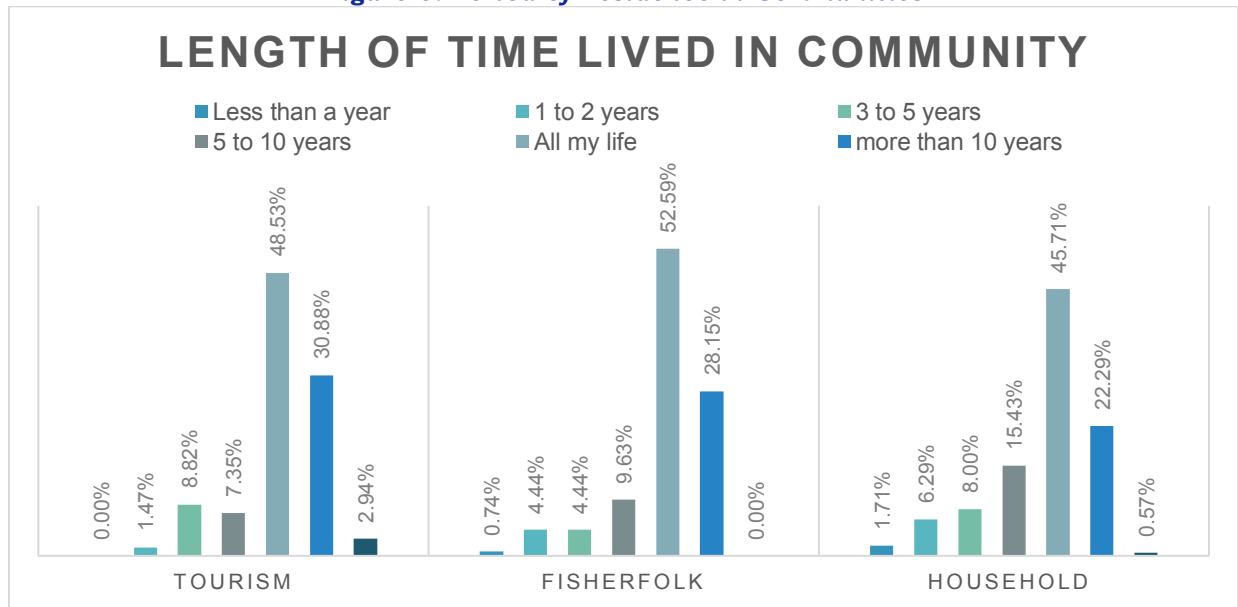
The main findings for the thematic areas of the baseline study are discussed in detail. These findings include the results of the surveys (household, fishers, tourism workers), focus group discussions and key informant interviews. The critical considerations conclude each thematic area to summarise the key takeaways with pertinence for subsequent interventions and actions in the communities that impact the MPAs.

5.1. DEMOGRAPHY

This section presents a description of the demographic factors that are characteristic of the communities where the survey was conducted. It comprises the details of the respondents, the community they reside in, length of time within the community, age, gender, ethnicity, educational and religious backgrounds. It also briefly discusses the demographic data to inform how this aids regular monitoring, data collection, programming and MPA management.

Residency: The respondents were asked how long they had lived in their respective community, and the responses showed that the residency patterns appeared consistent among the three groups surveyed. Household respondents and tourism sector workers share close similarity with residency duration since both groups have lived in the targeted communities for most of their lives or more than ten years. Fishers also exhibit a strong connection to their communities, with over half of the respondents living in the same place for their entire lives.

Figure 6: Period of Residence in Communities

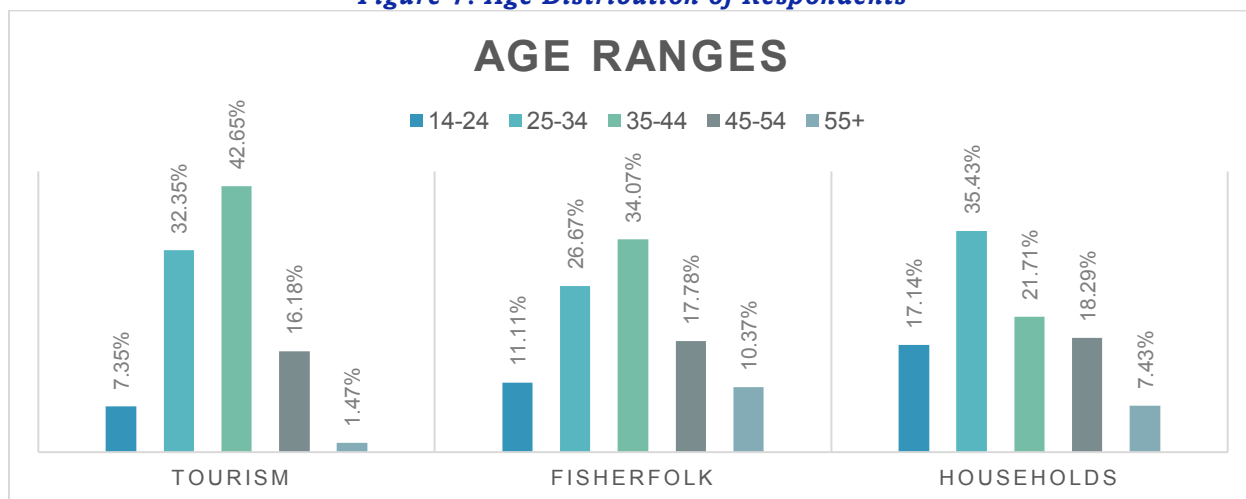


Source: Socioeconomic Baseline Survey, 2023 (clusters by households, tourism workers, and fishers)

Age: In terms of age, householders and tourism sector workers are primarily younger adults between 25 and 44 (Households, 57.14%; Tourism Workers, 73.53%). However, fishers have a more diverse age distribution, including that a significant proportion is aged between 35 and 54

and above 55. Comparatively, fishers tend to be older marine resource users than the heads of households and tourism workers surveyed.

Figure 7: Age Distribution of Respondents

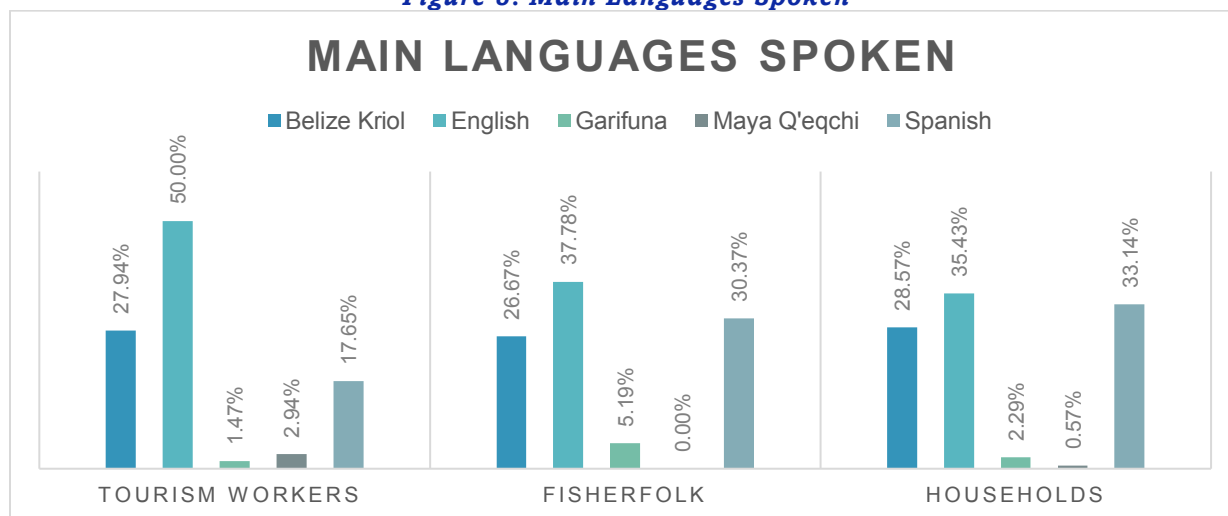


Source: Socioeconomic Baseline Survey, 2023 (clusters by households, tourism workers, and fishers)

Marital Status: When asked about their marital status, household respondents and tourism sector workers showed a mix of single, married, and common-law unions. Fishers, however, were more likely to be married or in common-law unions (66.67%) than the other two groups.

Language: Survey respondents were asked to specify the languages they mostly speak. From the responses given, English is the dominant language spoken across all three groups. However, in addition to English, Spanish and Belize Kriol are the top three (3) languages respondents report speaking. Kriol is the second most used language by heads of households and tourism workers.

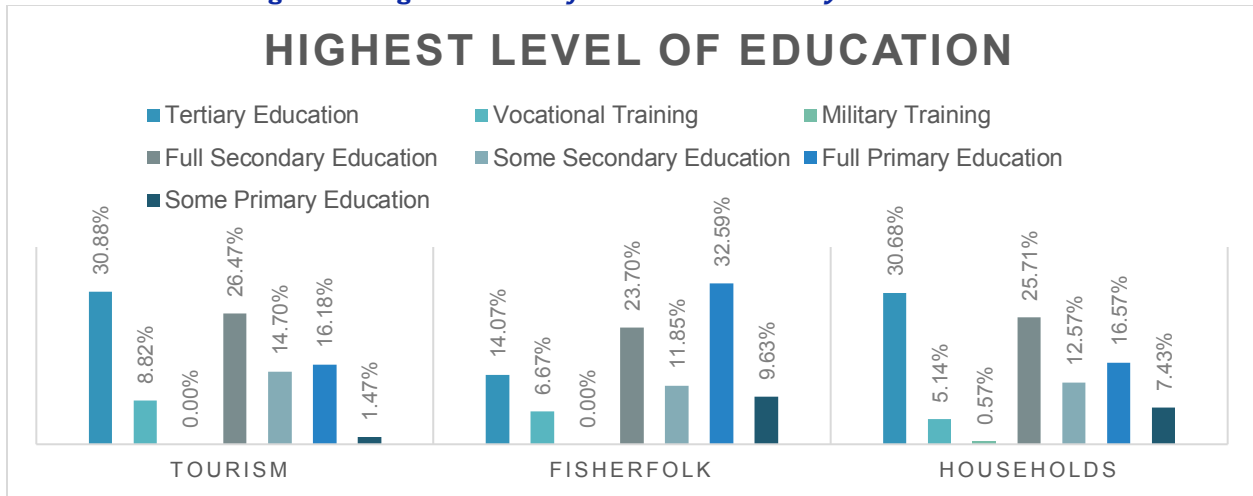
Figure 8: Main Languages Spoken



Source: SocMon Survey, 2023 (Clusters by households, tourism workers, and fishers)

Education: Tertiary-level educational qualification is more likely to be found at the household level and among tourism workers, since they reported higher rates of completion at 30.6% and 30.8%, respectively. Fishers reported having mostly some form of primary-level education (42.22%).

Figure 9: Highest Level of Education in Study Communities



Source: Socioeconomic Monitoring Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Ethnicity: Fishers identified that they were primarily Mestizo (39.26%), Kriol (27.41%), Garifuna (19.26%) and of mixed race (8.89%). Respondents who were tourism workers identified primarily as Kriol (41.18%), Mestizo (30.88%), Mixed race (13.24%), and Garifuna (8.82%). The household respondents identified as Mestizo (25.71%), Kriol (23.43%), mixed race (13.14%), and Garifuna (8.57%).

Sex: Overall, the users who directly interact with marine resources in the study communities are male. Survey respondents who are workers in the tourism sector are majority males (72.06%), as are the fishers (88.89%). Respondents from the household survey were both men and women, although women have a higher response rate in this group (52%). The latter response rate also indicates that men work outside the home and actively engage in marine-related activities for their livelihood. At the same time, women support marine activities, especially for livelihood and household resilience, a matter that is further explored in the report.

Overall, the data in this section suggests that engagement with communities and users who impact the MPAs could be more effective when the core demographic factors of age, languages spoken, ethnicity and sex are integrated into management and field actions.

5.1.1. CRITICAL CONSIDERATIONS – DEMOGRAPHY

- Residential Longevity** ○ Generally, the demographic data show that marine resource users are transient in the conduct of their livelihood, but they maintain long-term connections and roots in their communities of origin.

- Varied Education levels** ○ The education levels in the focus communities, though varied, show that information provided to marine users should be consistent with the level of education they report to have completed.

- English Language** ○ Community members and respondents mostly report speaking English, but the languages they engage socially and culturally are Spanish and Belize Kriol.

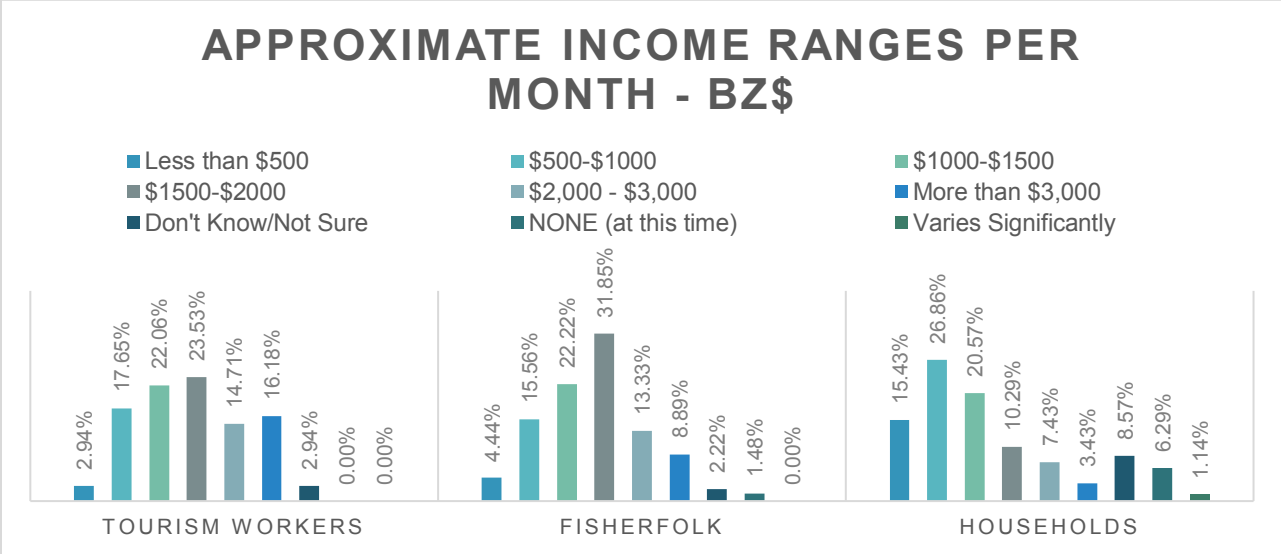
- Age Diversity** ○ Marine resource users vary according to age, and most are young males between the ages of 25-44, but a significant number are also older men.

5.2. ECONOMIC CONDITIONS

This section documents employment and income including expenditures and patterns of expenses for household necessities and income generating activities sustained from interactions with marine resources. Understanding livelihood is crucial for effective socioeconomic monitoring since it provides valuable insights into the economic wellbeing of communities. By knowing the livelihood activities and sources of income prevalent in coastal areas, practitioners and managers can assess the extent of dependence of local populations on marine resources, identify vulnerable groups, and evaluate the potential impacts of management interventions on their wellbeing.

Income: Among respondents, the average household income was less than \$1500BZD per month (\$750USD), and 45.71% of households with 1-6 occupants had incomes below \$1500BZD. Those who are engaged in the tourism sector earn their livelihoods as tour guides (50.00%), tourism-related workers (22.06%), and tourism business managers or owners (13.24%). Of note, a considerable proportion of this group (23.53%) earn between \$1500BZD and \$2000BZD (\$750-\$1000USD) monthly. A further 22.06% of tourism workers earn between \$1000BZD and \$1500BZD (\$500-\$750USD) monthly. Of those working in the tourism sector, females are much less likely to be employed in a secondary occupation, unlike males (24.49%). Furthermore, the males who had secondary occupations worked as fishers (28.57%). In the tourism sector, some tour guides are also fishers. Interestingly, female respondents in the tourism sector stated that their primary job in this sector was as a business owner (31.58%) and skilled service workers (36.84%).

Figure 10: Monthly Income Earned by Cluster Groups



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

The incomes reported by the three groups surveyed align closely with the results of the Statistical Institute of Belize’s (SIB) Labour Force Survey (LFS, Sept. 2023). According to the SIB, employed persons earn an average monthly income of BZ\$1,392. Further alignment can also be noted, where the SIB reports a higher average monthly income of BZ\$1,573 for employees in the formal sector compared to those in informal employment who earn an average of \$1,074 per month. No generalisations can be drawn from the survey responses in this report, however, the LFS figures for income are consistent with the reported earnings of the respondents from households, tourism workers, and fishers, as well as the feedback received in the FGDs.

There is some durability in tourism-related employment since responses show overall prolonged employment in tourism, with a significant proportion (25%) of respondents having been employed between six (6) and ten (10) years. Notably, tourism workers tend to have a measure of diversity to their income generation capacities. Fishers, however, are more dependent on the harvesting of wild seafood for their livelihood and 84.44% report that they earn their income principally from fishing on a full-time basis. Fishers may also take on other seasonal jobs, and some of them (31.83%) work part-time in tourism or other service-sector industries and in trade jobs such as day labourers. By way of income generation, fishers earn incomes ranging from \$1000-\$2000BZD (\$500-\$1000USD) per month. It should also be noted that the demographic data collected point to fishers as being older and this might have some bearing on their capacity and willingness to take on other employment opportunities.

Fishers' overall income should also reflect women's contributions, though this is not usually quantified. However, the feedback during the all-female FGD indicates that they actively contribute to the household income generated directly from seafood harvesting. According to the women, their household income largely comes from fishing, but it is often not the only income the family generates. The hidden and unrecognised nature of female work reflects the gendered nature of work in the Belizean context. This also aligns with the often-discussed nature of unpaid house and care work that women generally do. Specific to livelihoods from fishing, female fishers or (fisherwomen as they refer to themselves) are responsible for inspecting equipment, handcrafting fishing gears, operating fishing vessels, studying weather conditions, preparing bait, constructing and setting up lobster shades, testing fishing equipment, maintaining records of marine catch, identifying and monitoring species populations in fishing zones (areas), conducting diving, harvesting fish (including via deep sea fishing), measuring fish and returning undesirables to sea, cleaning and filleting marine produce, and identifying customers, among other activities. Women make active contributions to the seafood economy, but often, their contributions go unacknowledged or unnoticed.

Figure 11: Women’s Wild Seafood Harvesting Contributions

PRE-HARVEST ACTIVITIES	POST-HARVEST ACTIVITIES
○ Cleaning boats and mending gears	○ Fish sorting, icing, packing, and loading conch, lobster, and finfish for transport to cooperative seafood companies,
○ Procuring and preparing food supplies for fishing expeditions	○ Smoking and drying fish
○ Monitoring weather conditions	○ Drying seaweed
○ Providing economic support (including purchasing of fishing gear and other equipment)	○ Cleaning and filleting marine produce
○ Conducting traditional prayers or religious activities for safe travels	○ Marketing and sale of marine produce.
○ Construction/ production of equipment (lobster traps)	○ Securing buyers and establishing clients and marketing networks
	○ Preserving the catch for local sale and household consumption

Source: Socioeconomic Baseline Study FGD, 2023.

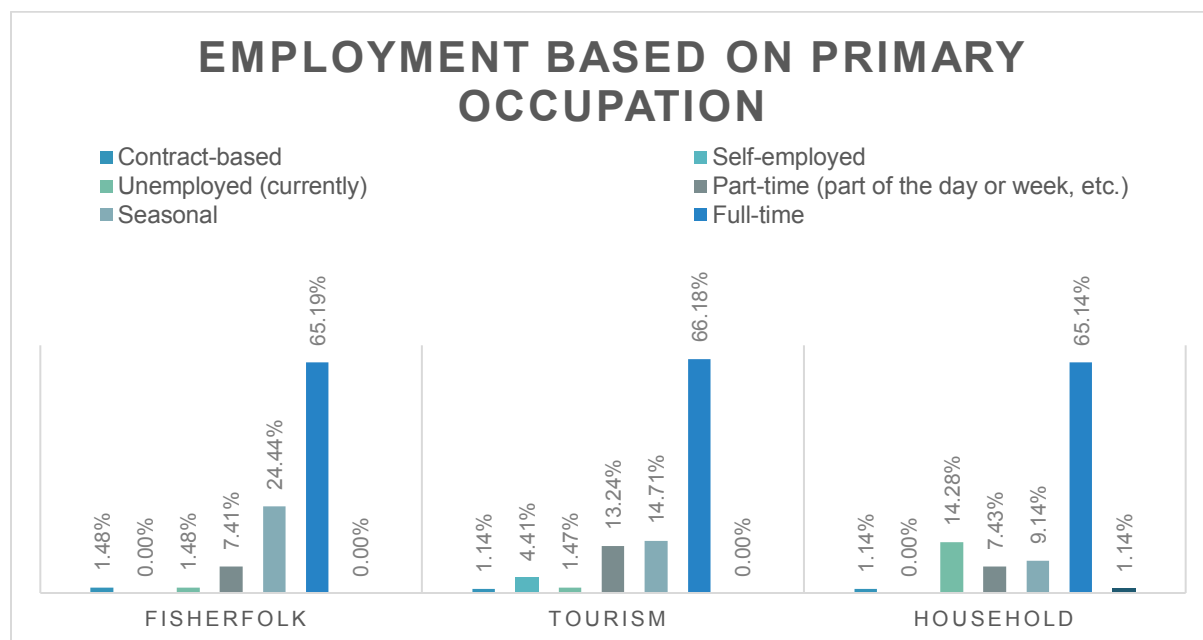
The study found that workers in the tourism industry, fishers, and household respondents have varying levels of income generation. Among and within these groups, it can be observed that each participates in distinct activities to secure their livelihoods. Fishers overwhelmingly depend on marine resources, suggesting the importance of sustainable fisheries management. Interestingly, the experience of generating income from the sale of seafood harvests is not equal or equitable

for all despite the quantity of harvest results and the products on offer. Although given fishing licenses, women report that they may be challenged to sell their products at the going rates unless they are under the “protection” of a fisherman – spouse or male companion. This discrepancy limits women’s economic independence and diminishes their earning capacities. In the FGD with women, one participant shared that her income from seafood harvesting would be negatively affected if she operated independently from a fisherman.

Employment: Income generation and livelihood for the three groups surveyed depend highly on the extent of their engagement with marine resources. For fishers and tourism workers, the primary income sources are from seafood harvesting (fishing) and the provision of tourism services and experiences.

At the household level, however, employment is varied, and respondents say that while they depend predominantly on skilled labour to earn their income, they may also be employed in the public sector, or in sales and retail, farming, or self-employed. Being a housewife also counts as a source of livelihood among female respondents, and 46.86% report contributing to the household overall income. Furthermore, at the household level, the study respondents report being in full-time employment (65.4%), but unemployment in this group was also high at 14.28%. While this study does not lend for generalisations to the wider society, it can be noted nonetheless, that unemployment rate among respondents indicates that communities that impact the MPAs of this study, may experience a higher level of unemployment when compared to the national unemployment rate of 4%.¹⁶

Figure 12: Employment Based on Occupation



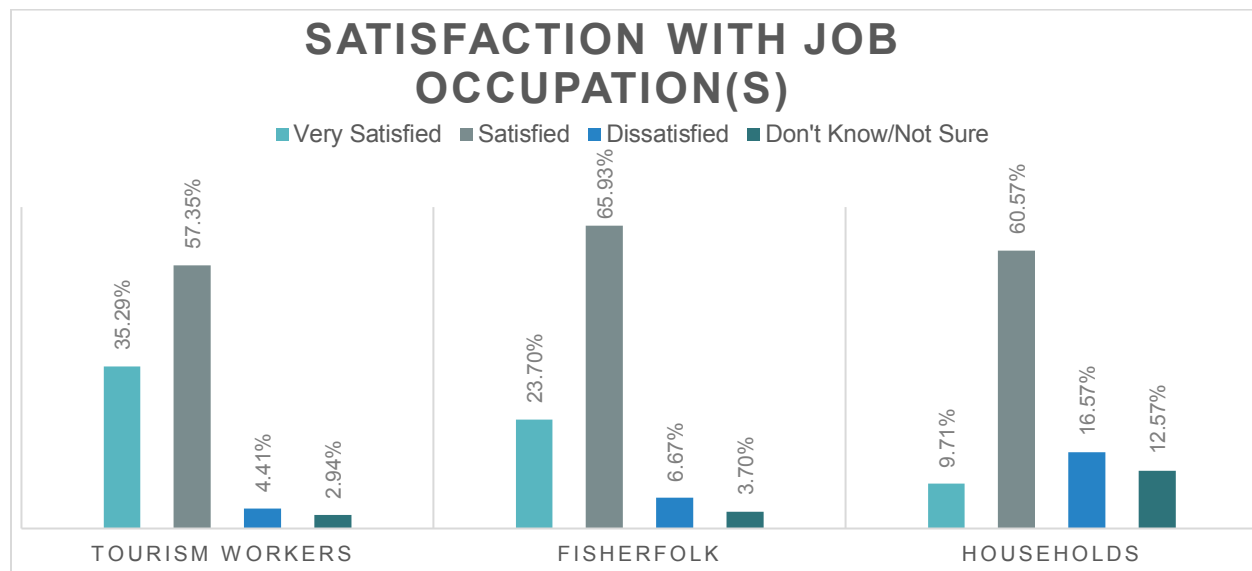
Source: Socio-economic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Despite high living expenses, a significant percentage of the survey respondents are satisfied with their jobs as captured in **Figure 13**. The report highlights that marine activities and seafood harvesting remain a primary source of income and employment opportunities for families, tourism

¹⁶ Statistical Institute of Belize (2023), Labour Force Survey, LFS Release for September 2023 and published on December 13th, 2023, showed that, in September of 2023, the national unemployment rate stood at 4 per cent, a decrease of 1 percentage point when compared to October 2022.

workers, and fishers. However, better economic practices regarding sound product management and accounting skills are necessary for fishers and households. Fishing remains a male-dominated sector, and some practices continue to exclude women from the economic benefits of marine activities. The persistence of these practices is detrimental to the economic resilience of households in these communities of this study. Additionally, the seasonality of work remains a challenge for fishers and diversification initiatives with low barriers to entry are needed to address this issue. This matter is addressed in the marine activities section of the report.

Figure 13: Job Satisfaction by Cluster Group



Source: Socioeconomic Monitoring Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

5.2.1. CRITICAL CONSIDERATIONS – ECONOMIC CONDITIONS

Varying levels of income security	Workers in the tourism industry, fishers, and households have varying levels of income security, which may reflect the seasonal nature of job opportunities in these sectors.
Primary source of income and livelihoods	Marine activities for tourism and seafood harvesting continue to be the main sources of income and employment for stakeholders that impact the MPAs in the study.
Female marginalisation	Wild seafood harvesting practices continue to exclude women from participation in marine activities, negatively impacting the economic resilience of households.

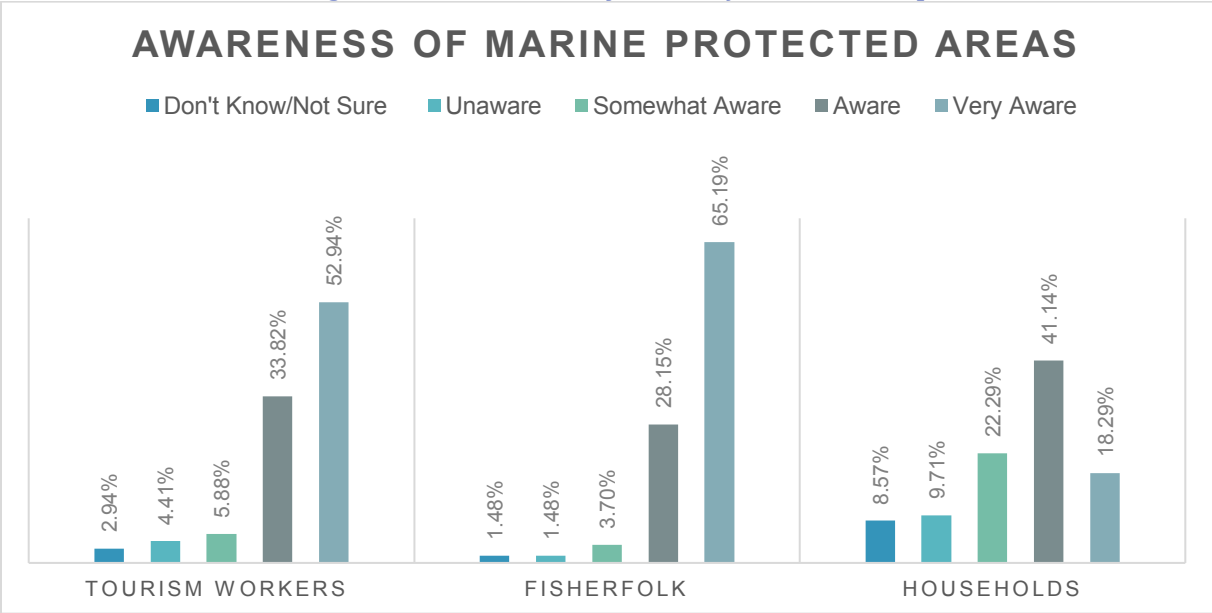
5.3. AWARENESS AND PERCEPTIONS

This section reports on the levels of social awareness and perceptions of the marine environment, regulations, problems affecting the marine environment and livelihoods in the communities and stakeholders in this study.

Awareness of MPAs: At the household level, there is significant awareness of MPAs with 81.72% of the respondents indicating an awareness of the benefits of, and problems experienced with MPAs. **Figure 13** shows that overall, respondents have greater awareness of the Blue Hole Natural Monument (50.28%) and Turneffe Atoll Marine Reserve (47.23%). Yet, there is limited awareness (8.43%) of the rules and regulations for marine resource conservation at this level. Among respondents who work in the tourism sector, there is a higher awareness of MPAs and their benefits; and, like the household respondents, tourism workers are very much aware of the Blue Hole Natural Monument (86.77%) and the Turneffe Atoll Marine Reserve (80.89%). The level of reported awareness of coastal and marine rules and regulations (43.39%) among tourism workers is reasonable, but this could be higher given the nature of their work and their constant interactions with the MPAs.

Fishers tend to demonstrate the highest awareness of MPAs (65.19%). They also report knowing individual MPAs, though this awareness is highest for the Turneffe Atoll Marine Reserve, Half Moon Caye Natural Monument, and the Turneffe Atoll. The MPAs in the south, particularly South Water Caye Marine Reserve and the Port Honduras Marine Reserve, have the lowest reported levels of awareness across all three (3) groups. Of the three groups, however, fishers reported a combined higher awareness of (81.48%) of marine regulations. The low level of awareness reported at the household level should be considered as an entry point for outreach targeting. This matter is discussed further in the section on communication.

Figure 14: Awareness of MPAs by Cluster Groups



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Awareness and Perception of Governance and Management: Respondents were asked about their perceptions of governance and management. To answer these questions, respondents were expected to provide feedback as seen in **Figure 14**, on how they interpret and assess the dynamics of the MPA(s) in which they interact. When asked about their perceptions of MPA governance and management, households have positive views on this matter. They also believe MPAs are essential for livelihood (88.53%) and marine ecosystem protection. They also perceive MPAs as vital for the sustenance of fish stocks.

The tourism sector workers also have positive perceptions about the importance of MPAs for ecosystem protection, and they strongly agree with this (58.82%), but a small minority disagree or are not convinced of the value of MPAs for their livelihoods (8.82%), **Figure 16**. Fishers (58.52%) have strong positive views or perceptions on the importance of marine protected areas. The majority, however, perceive that MPAs are an essential source of livelihood and help sustain fish stocks. At the household level, there is still some unfamiliarity with how MPAs contribute to their livelihoods as can be seen in **Figure 16**.

Figure 15: Perceptions of the Importance of MPAs for Protecting Marine Ecosystems

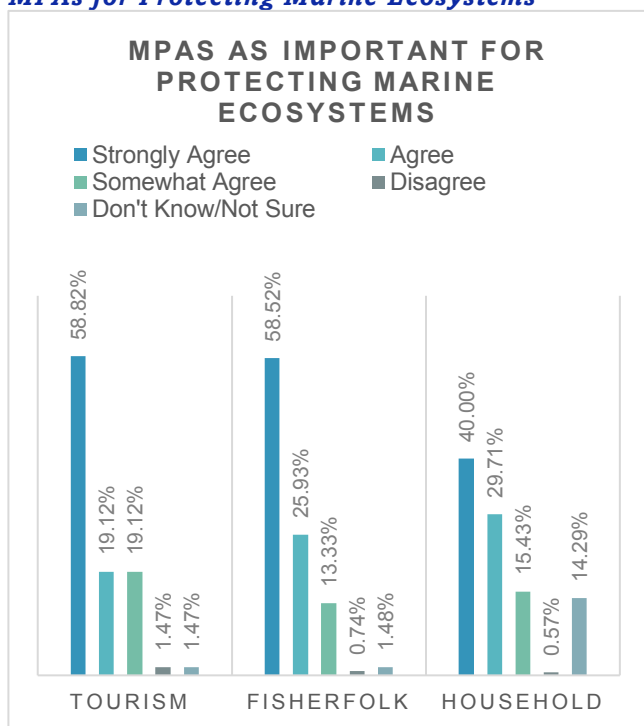
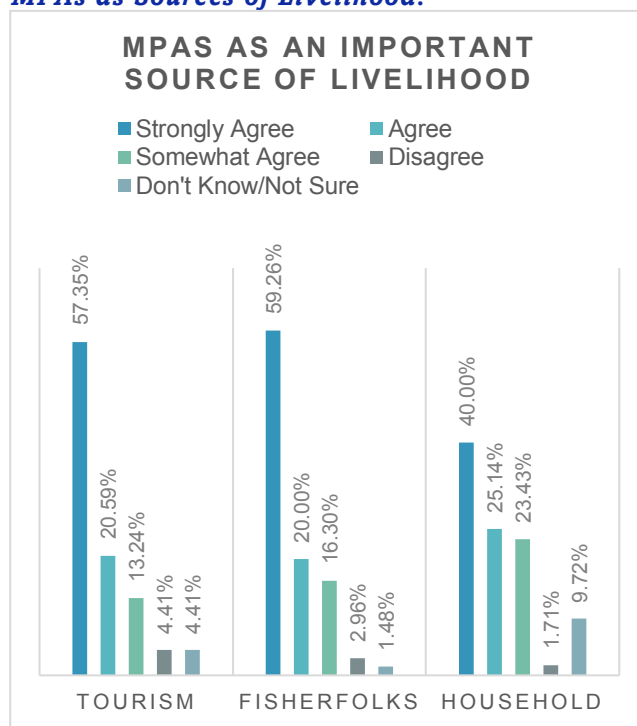


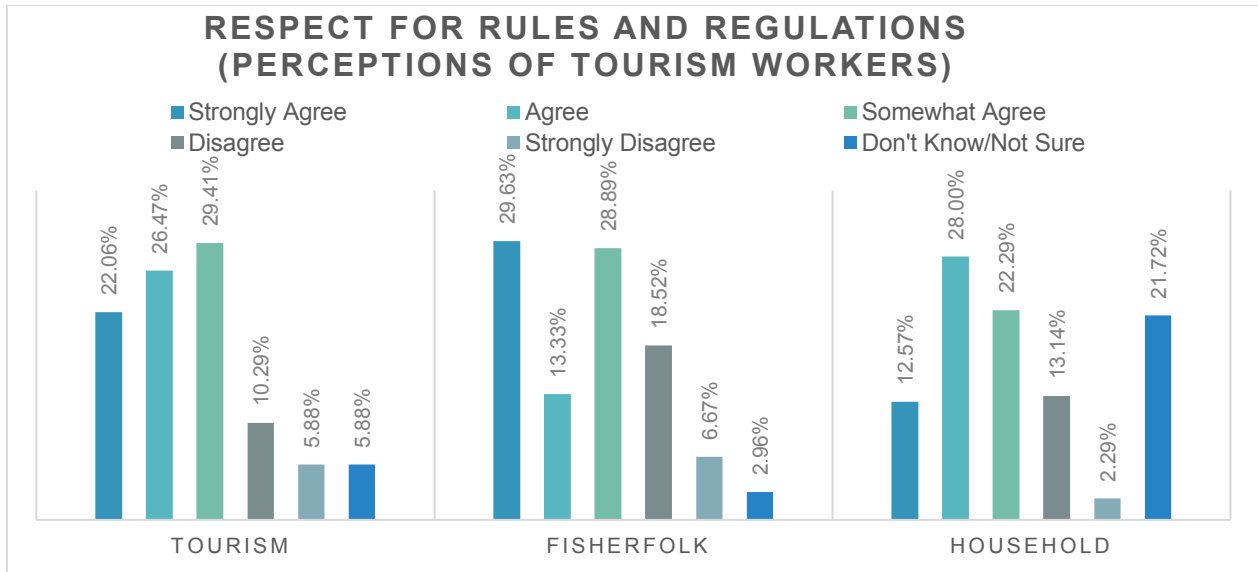
Figure 16: Perceptions of the Importance of MPAs as Sources of Livelihood.



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

As a group, tour guides perceive that fishers have respect for the rules and regulations governing marine-based activities as seen in **Figure 17** below.

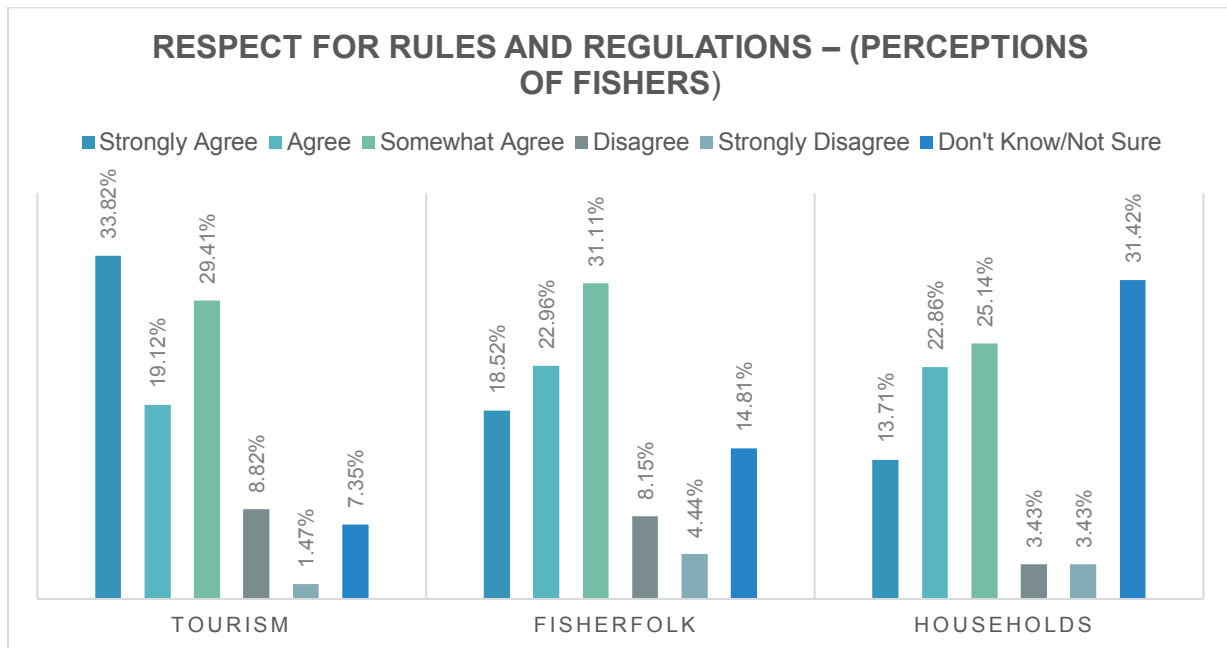
Figure 17: Governance Perceptions - Perception of the Respect for Rules and Regulations by Tour Guides



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Interestingly, fishers and tourism workers share similar perceptions regarding enforcing rules and regulations. Tourism workers tend to agree that fishers generally comply with fishing regulations (71.85%), and fisher folks also perceive this to be so (72.59%) about themselves. Tourism workers (77.94%) perceive that they abide by the rules and regulations, and fishers perceive that 72.59% of tourism workers follow the laws and regulations. From their responses, both fishers and tourism workers perceive the other as respectful of marine rules and regulations (Figures 17 and 18).

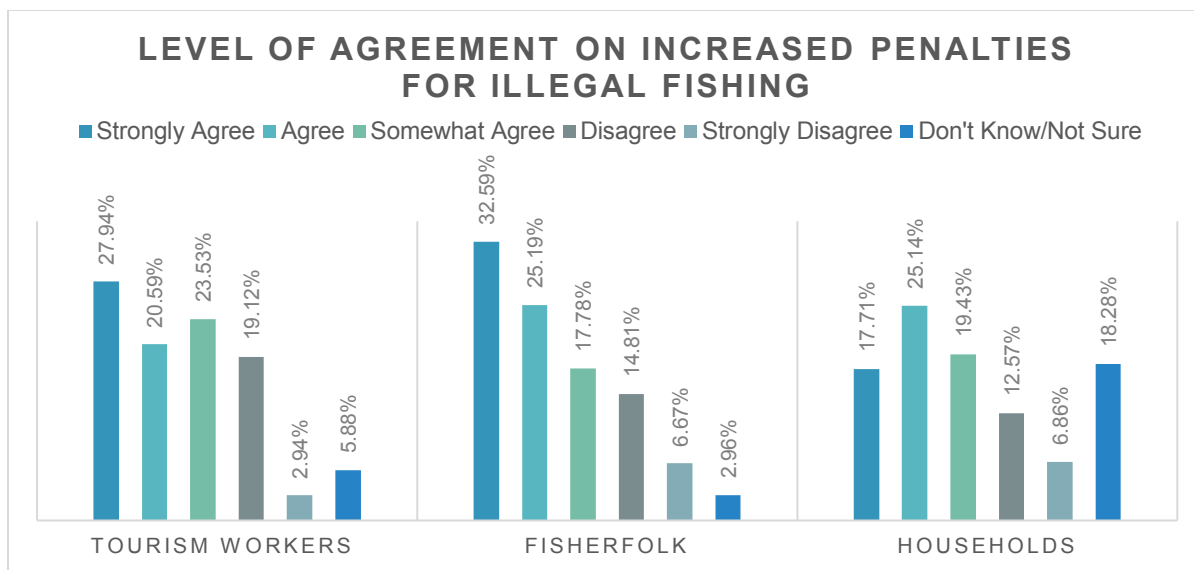
Figure 18: Governance Perceptions (Compliance with Rules and Regulations by Fisherfolk)



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Regarding increasing penalties for illegal fishing, tourism workers and fishers agree that this should be instituted, **Figure 18**. Both tourism workers and fishers also agree that fishing regulations need to be consistently enforced. Notably, 18.26% of household respondents do not know if the penalties for illegal fishing should be increased.

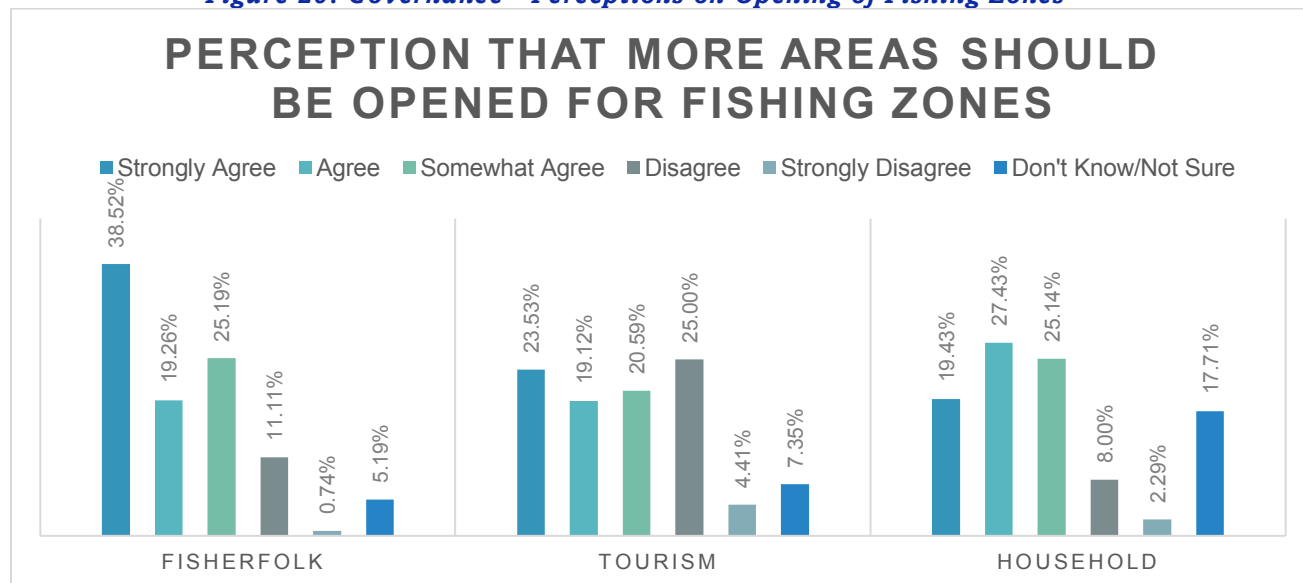
Figure 19: Perceptions on Penalties for Illegal Fishing



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

While fishers and tourism workers closely agree on matters of compliance and regulation, their perceptions on the opening of fishing spaces contrast as fishers more so than tourism workers, strongly agree that more should be opened. However, it is worth noting that fishers (25.19%) and tourism workers (20.59%) strongly disagree about opening these spaces.

Figure 20: Governance - Perceptions on Opening of Fishing Zones

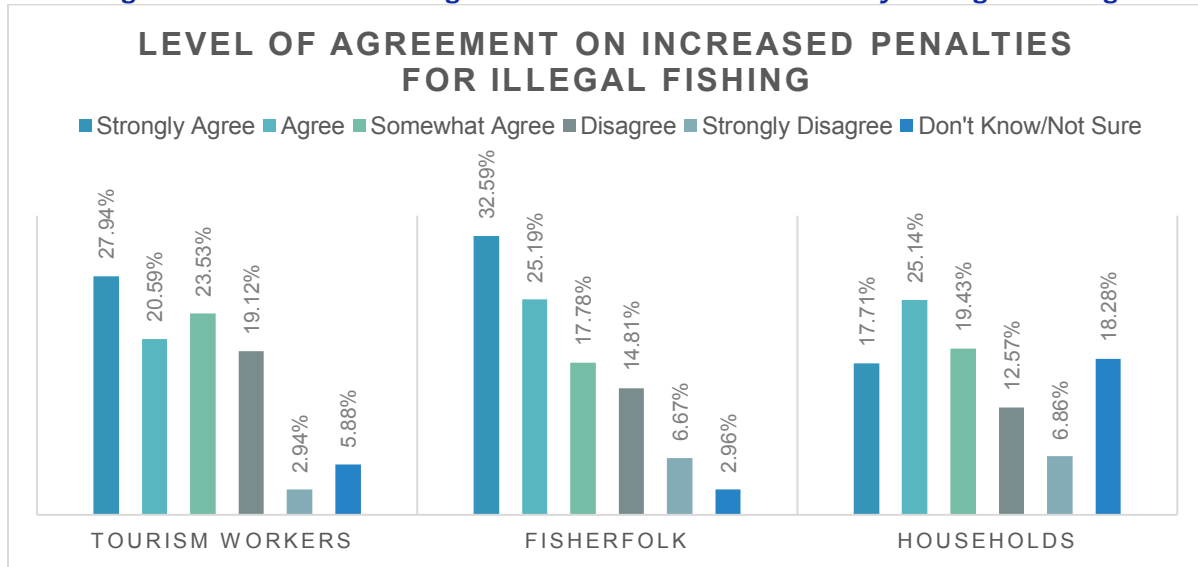


Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Rules and Regulations: In FGDs, participants perceive that some enforcement of the fishing regulations and rules is unequal and arbitrary. Participants cited that they do not feel that MPA

managers and rangers fully know how the rules and regulations are to be applied. Furthermore, fishers feel that as a group, they are more likely to engage with MPA staff and that by the sheer number of engagements they have with these staff, they will encounter more punitive interactions. However, fishers also spoke about the overzealousness of MPA staff in punishing rather than educating or informing them on the regulations and rules. This is important for MPA staff to note, given that a complete understanding of fishers' rules and regulations may take longer, possibly owing to the overall low literacy levels among group members and language barriers. Further discussion on the best communication and information-sharing methods for fishers, households, and tourism workers is presented in the communication preferences section of this report. However, both fishers and tourism workers are strongly in favour of increasing penalties for illegal fishing, **Figure 21**.

Figure 21: Governance – Agreement on Increased Penalties for Illegal Fishing



Source: Socioeconomic Baseline Survey, 2023 (Clusters by households, tourism workers, and fishers)

Perceptions of Marine Environment Condition: Perception of the condition of the marine environment varies across the groups. Households recognise pressures on marine ecosystems, including pollution (42.86%) and sea-level rise (38.86%). Generally, they perceive that there are changes in marine conditions over the past ten years. Tourism sector respondents identify the destruction of marine habitats (67.65%) and overfishing (61.76%) as severe pressures on the marine environment. This perception also aligns with their disapproval for the opening of additional fishing spaces. However, the tourism workers have a positive perception of marine conditions, with 60.29% rating them as "very good." Fishers recognise pressures like sea-level rise (92.59%) and overfishing (87.41%) as threats to the marine environment. They have mixed perceptions of changes in marine conditions, with 30.87% noting improvements and 30.29% observing worsening conditions. In FGDs, fishermen stated that they are familiar with the fishing regulations but experience confusion with some recent changes in the law. Some fishers stated there is too much legislation, while others said there is little management and enforcement of the regulations.

Perception of Marine Pressures & Recommendations: The table below lists the main issues that the FDG participants, survey respondents, and key informants expressed regarding perceptions of changes in the marine environment.

Table 5: Participants' Perception of Marine Conservation Changes and Suggestions for Actions

Marine Conservation Challenge	Social Impacts	Economic Impacts	Suggested Actions
Overfishing	<ul style="list-style-type: none"> ○ Decline in fish stocks, loss of livelihoods for fishers ○ Increased food insecurity 	<ul style="list-style-type: none"> ○ Reduced income for fishing communities ○ Decline in livelihood opportunities 	<ul style="list-style-type: none"> ○ Implement and enforce sustainable fishing practices. ○ Increase enforcement in marine protected areas. ○ Enable additional livelihood opportunities such as aquaculture or eco-tourism.
Coral Bleaching	<ul style="list-style-type: none"> ○ Loss of cultural identity for coastal communities ○ Negative impact on tourism jobs 	<ul style="list-style-type: none"> ○ Reduced tourism revenue ○ Degradation of coral reefs, which drives a significant tourism experience. 	<ul style="list-style-type: none"> ○ Enhance resources for coral reef monitoring and research. ○ Support strategies to mitigate climate change through adaptation actions. ○ reduce pollution and sedimentation
Habitat Destruction	<ul style="list-style-type: none"> ○ Displacement of coastal communities, ○ Loss of ecosystem services 	<ul style="list-style-type: none"> ○ Loss of critical marine habitats (e.g., mangroves, seagrass beds) that support livelihood and income generation 	<ul style="list-style-type: none"> ○ Strengthen coastal zone management regulations. ○ Improve access to regulated fishing in marine reserves. ○ Implement habitat restoration projects.
Pollution	<ul style="list-style-type: none"> ○ Contamination of marine ecosystems, harm to marine life and human health 	<ul style="list-style-type: none"> ○ Negative perception of tourism destinations ○ Loss of revenue from tourism 	<ul style="list-style-type: none"> ○ Improve marine waste management practices. ○ Enforce pollution regulations and promote public awareness and community clean-up campaigns along the coast.
Invasive Species	<ul style="list-style-type: none"> ○ Disruption of native ecosystems, loss of biodiversity on which households depend 	<ul style="list-style-type: none"> ○ Impact on fisheries and tourism ○ Increased management costs 	<ul style="list-style-type: none"> ○ Implement measures to manage invasive species, ○ enhance monitoring and control efforts, ○ promote public education and awareness
Unsustainable Tourism	<ul style="list-style-type: none"> ○ Overcrowding and degradation of marine sites, ○ Pressure on cultural traditions in local communities 	<ul style="list-style-type: none"> ○ Loss of authenticity in tourism experiences 	<ul style="list-style-type: none"> ○ Implement and enforce carrying capacity limits, ○ Promote responsible tourism practices. ○ Enhance training of tour guides and tour operators. ○ Engage local communities in tourism planning, decision-making, and product development.
Coastal Erosion	<ul style="list-style-type: none"> ○ Loss of coastal land, displacement of communities, ○ Damage to infrastructure 	<ul style="list-style-type: none"> ○ Economic losses from property damage, ○ Increased vulnerability to storms and sea level rise 	<ul style="list-style-type: none"> ○ Implement coastal protection measures. ○ Ensure compliance with coastal development and applicable building codes. ○ Enforce stricter penalties for non-compliant coastal development. ○ Integrate climate change mitigation and adaptation into coastal planning and development

A key takeaway from the above discussion on MPA awareness and perceptions of the marine environment is that information must be tailored to the needs of each group. For household respondents, the focus should be on increasing their knowledge of specific MPAs and related regulations. For fisherfolks, this may mean reinforcing the importance of rules since they report high awareness of what they entail. Additionally, efforts to partner with fishers (and tourism workers) as educators should be considered in management strategies so that they are also active in safeguarding the benefits that regulations afford their livelihoods.

Furthermore, including women and youth in community-based outreach is essential because they well-poised to contribute to the longevity of actions for sustainable fishing and tourism. By considering and including each group's unique perspectives and contributions, MPA managers can develop more effective interventions for preserving the marine ecosystems they manage.

5.3.1. CRITICAL CONSIDERATIONS – AWARENESS AND PERCEPTIONS

Tailored awareness campaigns

- Household respondents should be educated about specific MPAs and regulations, while fisherfolks and tourism workers should be consistently reminded of their importance, given their reported high levels of awareness.

Targeting women and youth

- Women and youth have unique perspectives, awareness and perceptions of the marine environment and marine protected areas, which need to be included in planning processes and implemented in related interventions. They also have close proximity to fishers and tourism workers and can be influential through their education and outreach efforts.

5.4. MARINE USES AND ACTIVITIES

This section elaborates on the respondents' dependency and frequency of interaction with marine resources; it also presents the activities conducted in the marine areas of the study. Critically, it helps to understand how the communities and stakeholders benefit from the resources in and around the five MPAs. Marine activities and uses vary by group. Still, the information and data provided here help with the generation of more insights on how the communities interact with and impact the MPAs.

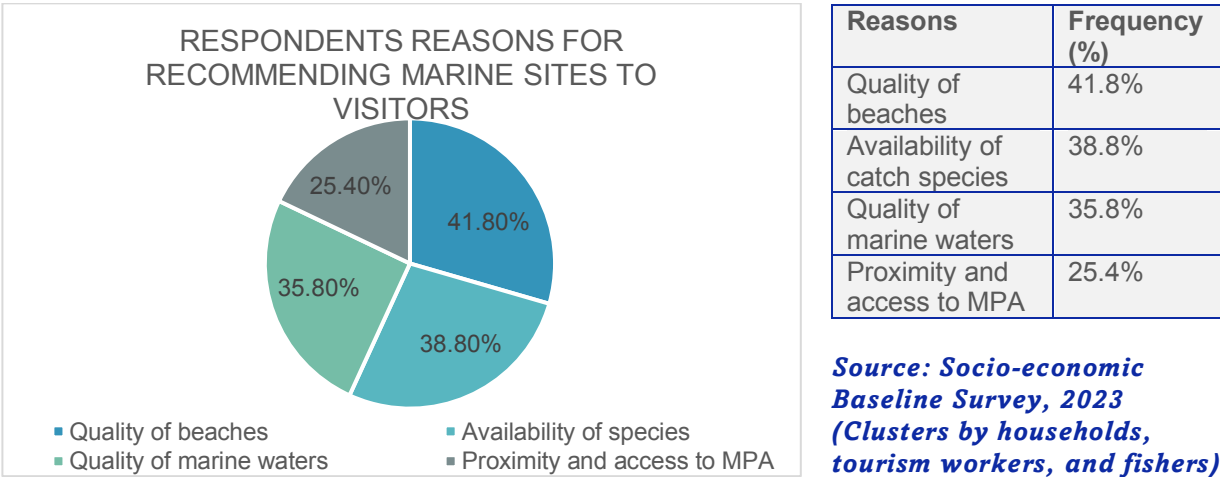
Household Marine Goods: At the household level, respondents provided feedback on the marine products they use for sustenance and food security. Their responses indicate that most households use the marine products harvested for personal consumption. In response to the kinds of marine products used, household respondents offer that in addition to the standard or common seafood products - finfish, conch, lobster, and other shellfish - they also use sand and gravel (aggregates), sea cucumbers and seaweed. The standard seafood products used by households also compare to the main products that fishers report harvesting, including lobster, finfish, and conch, as well as a variety of species such as crab and other shellfish.

Households Marine Activities: Households report that they rarely participate in marine activities, but when they do, they commonly engage in swimming (72.6%), beach walking and running (65.7%), snorkeling (42.9%), educational trips (49.7%), and commercial fishing (40%).

Tourism Marine Goods: Most of the marine ecosystems and species used by tourism workers are non-harvested or catch and release. These respondents listed that the main marine species that form part of their tourism attraction packages are corals, turtles, reefs, coastal vegetation, mangroves, sharks, stingrays, manatees, snapper, barracuda, Goliath Grouper Wahoo, Tarpon, and Permit fish.

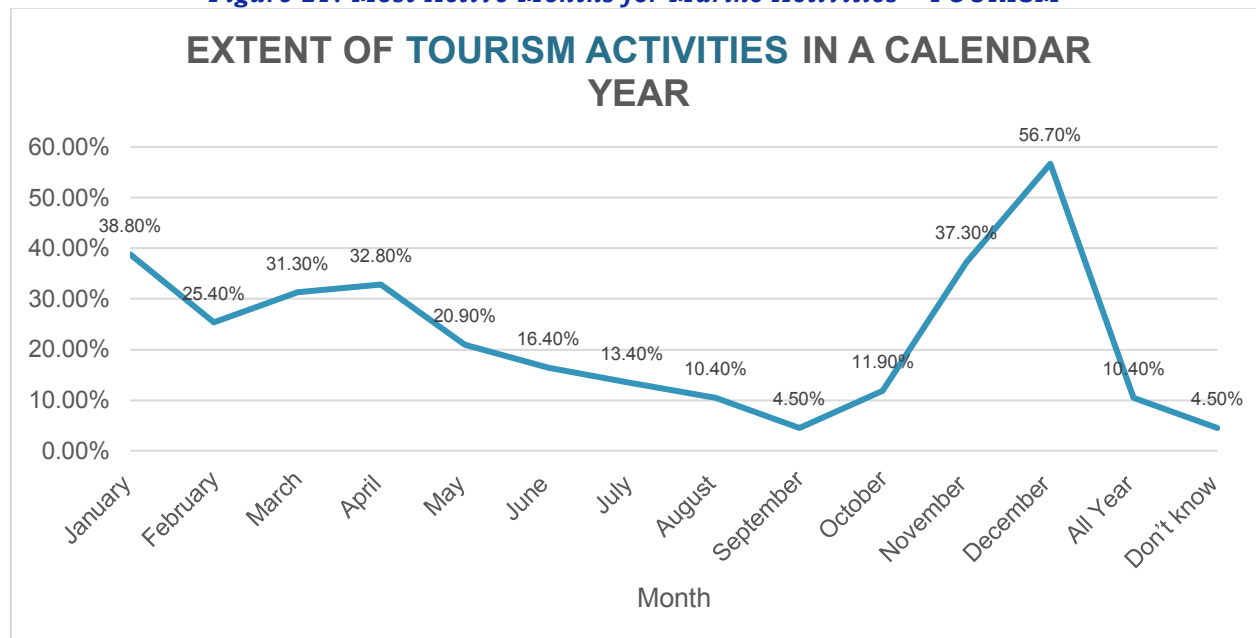
Tourism Marine activities: Marine uses and activities vary for tourism workers. When asked how they use marine resources for their work activities, they report that they recommend the Blue Hole Natural Monument, Halfmoon Caye Natural Monument, and the Turneffe Atoll Marine Reserve to tourists. These respondents refer to or use the marine sites based on proximity and access to MPAs, the marine water quality, the availability of species, and the quality of the beaches. This is further elaborated in **Figure 19** below.

Figure 22: Reasons for Recommending Marine Sites to Visitors



According to tourism workers, snorkeling is the most popular activity they engage in since this was highly requested by their tour clientele (57.35). Swimming was a close second (52.94%), and boat trips rounded up the top three popular tourism activities (48.53%) in and around the MPAs. Dining and entertainment were enjoyed by 39.71% of those surveyed, followed by sport fishing (38.24%) and scuba diving (36.76%). *Tourism workers are most active from November to April, but December (56.7%) is reported as the most active month for them.*

Figure 21: Most Active Months for Marine Activities - TOURISM



Source: Socio-economic Monitoring Baseline Survey, 2023 (Tourism Cluster)

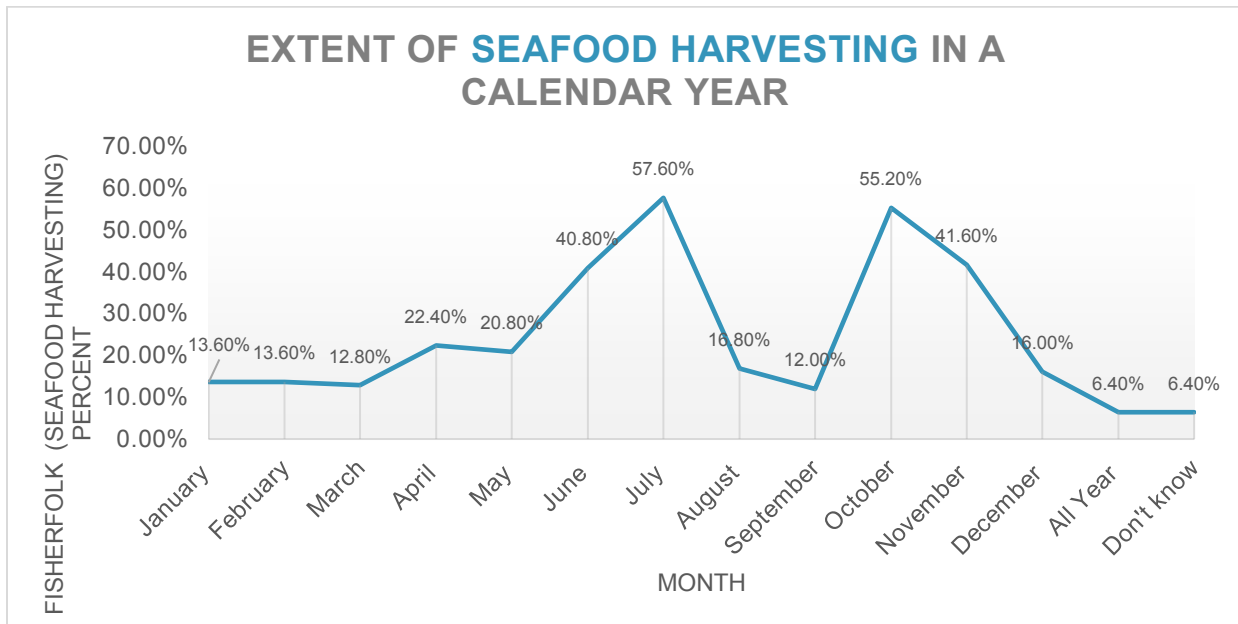
Fishers Marine Goods: The primary marine produce harvested by fisherfolk was lobster (31.19%), finfish (30.58%), such as snapper, grouper, and mackerel to name a few species and conch (28.44%). Other marine products harvested include seaweed, crab, and other shellfish. Respondents were unsure or didn't know about the quantity of marine products they harvested per annum. Still, those who provided estimates stated that, on average, their harvests ranged from about 300 to 2000 pounds of products per season. Fishers also reported that they were unlikely to engage in marine activities other than commercial and subsistence fishing.

Over 60% of fishers sell 50%-100% of their produce to fisher cooperatives or seafood companies for export, while a moderate percentage (25-50%) sell to local fish vendors, hotels, and markets. Almost 80% of fishers retain at least 15% of harvested produce for household consumption.

Responses to the survey indicate that fishers are more actively harvesting in some areas than others. In FGDs, fishers shared that they fish primarily in Areas 1, 2, 6, and 7 near TAMR, HCNM, and the SCMR.¹⁷ In interviews, the fishermen also stated that their *most active months for seafood harvesting were June (13.94%), July (16.97%), October (13.03%), November (9.70%), and January (6.36%).*

¹⁷ There are a total of nine (9) fishing zones in Belize.

Figure 23 Most Active Months for Marine Activities (Seafood Harvesting)



Source: Socio-economic Monitoring Baseline Survey, 2023 (Fishers' Cluster)

In the FGDs, women from fishing households corroborated that they too experienced that June, July, October, and January were the busiest months for fishing activities. In these months, time spent by women in their microenterprises or employment doubled as they helped to maintain their households and their business while supporting their spouses (fishermen) with pre-harvest and post-harvest activities. Women who participated in the FGDs from fishing communities also shared that they face multiple challenges, including changing regulations, stigmatisation, and mistreatment, which have caused them to avoid fishing either as a primary or secondary occupation. They experience social and economic pressures when they fish even though this is a crucial source of food, income, social and cultural preservation. Even though they are foundational to the traditional practices of wild seafood harvesting, the women express that they remain marginalised and excluded from participating in this sector.

Perception of Challenges - Fishers

Generally, fishers face various social, cultural, and economic challenges that impact their livelihoods and well-being. A summary of these challenges is presented below.

- **Declining catches:** Fishers voice that overfishing and unsustainable fishing practices have led to declining fish stocks in Belizean waters. This not only affects their ability to earn a livelihood but also threatens food security and the sustainability livelihoods in coastal communities.
- **Higher fuel & other logistical costs:** Fishers are challenged by the high costs of fuel. The logistical and associated expenses for equipment maintenance, vessel repairs, and transportation add another level of strain on the financial resources of fishers, particularly those operating smaller vessels or conducting artisanal fishing. Fishers also experience persistent barriers when accessing financing, and this constrains their capacity to adapt to changing market dynamics or invest in more fuel-efficient fishing equipment and technologies. In interviews and discussions, fishers share that they grapple with declining profitability from wild seafood harvesting and their increased vulnerability to economic shocks.
- **Limited access to resources:** Fishers from the communities in this study generally operate on a small scale, and they tend to lack access to updated fishing technologies

and equipment. They report having limited access to resources such as fuel, gear, and boats, which can hinder their productivity and competitiveness in the fishing industry.

- **Safety at sea:** Fishers report increasing experiences with hazards such as rough weather conditions, accidents, and emergencies at sea. They report having inadequate safety equipment, training, and emergency response resources to support them during these perilous times.
- **Piracy:** Piracy is a growing concern for fishers and tour guides. The piracy incidents that were shared in interviews and FGDs involved armed attacks on vessels, including fishing boats, tourist charters, and cargo boats. Fishers stated that there was minimal assistance from law enforcement authorities, including Belize's Coast Guard when such incidents occurred. They expressed that they would like to see law enforcement more actively engaged in efforts to combat piracy through increased surveillance, patrols, and cooperation with relevant partners. They also believe that strengthening maritime laws, improving enforcement capacities, and addressing underlying socio-economic factors can assist with addressing criminal activities at sea.
- **Competition and conflict:** Competition for fishing grounds and resources among local fishers and those from neighboring countries, can lead to conflicts and tensions. Disputes over territorial waters, fishing rights, and resource access can also exacerbate social and cultural divisions within fishing communities.
- **Environmental degradation:** Environmental degradation from habitat loss, pollution, and climate change, pose significant challenges to fishermen in Belize. Degrading marine habitats such as coral reefs and mangroves can reduce fish and biodiversity stocks, affecting fisher's catch and income.
- **Market dynamics:** Fluctuations in fish prices, market demand, and minimal access to markets can impact fisher's income and economic stability. Fishers generally depend on a limited number of buyers or middlemen, which can also affect their bargaining power and profit margins.
- **Cultural identity and heritage:** Although fishing is deeply ingrained in the cultural identity and heritage of the inhabitants of coastal communities in Belize, rapid socio-economic changes and urbanisation can influence traditional fishing practices, knowledge, and family cultural values. These dynamics can bear on the social and cultural identity of fishers and their coastal communities.

Addressing social, cultural, and economic challenges will require approaches that prioritise sustainable fisheries management, community empowerment, and socio-economic initiatives that meet the specific needs of coastal communities. Greater collaboration among government agencies, non-governmental organisations, and fishing communities will be essential to overcome these challenges and build the resilience of marine resource users.

Perception of Challenges – Tourism Workers

Tour guides and workers in the tourism sector face various social, cultural, and economic challenges that impact their livelihoods and well-being. In FGDs, participants share some of these challenges which are summarized below.

- **Seasonal Employment:** Tourism in Belize is often seasonal, with a peak tourist season followed by periods of low activity, usually experienced after April annually. This seasonality can lead to fluctuations in employment opportunities and income for owners of related microenterprises, tour guides and workers in the tourism sector.
- **Low Wages:** Owing to the seasonality of tourist arrivals, many tour guides and workers in the tourism sector may earn low wages if they depend on tourism for their primary employment and if they work in entry-level positions or for small tour operators. Low wages can prove difficult for these workers to have sustainable livelihoods, especially if they cannot supplement their incomes.

- **Informal employment:** Participants shared that having informal jobs can leave tourism workers vulnerable to exploitation and discrimination and deprive them of social protection and coverage.
- **Competition and displacement:** The competition for tourism jobs and opportunities can be challenging, especially in popular tourist destinations. People from indigenous communities, afro-descendants, and rural, full-time residents in coastal communities, may become economically displaced as they face competition from service workers who move to their communities where the tourism products and jobs may be more widely available.
- **Cultural appropriation:** Participants share that they are not protected from intellectual theft since community-based research on marine resources, though plentiful is not regulated or monitored. Fishing skills and traditional fishing technology and practices were cited as some of the areas highly sought after by researchers, non-government organisations and private sector individuals. Respondents feel that sometimes sharing this information can lead to economic and intellectual losses, especially, when it is used as part of tourism packages and products that they do not then benefit from.
- **Environmental degradation:** Unsustainable practices resulting from land development such as pollution, and habitat destruction, can contribute to environmental degradation. Degradation of natural resources and ecosystems can impact the quality of tourism experiences and threaten the long-term viability of the local products on offer.
- **Training and professional development:** Many tour guides and tourism workers feel that they are not benefiting from ongoing training and professional development opportunities. Training activities should be made accessible to advance the careers of tourism workers, improve their skills, and enable them to provide high-quality services to all visitors.

Sustainable tourism development strategies that prioritise community empowerment, environmental conservation, and equitable economic opportunities can help mitigate these challenges and ensure long-term engagement with tourism workers, especially those in the coastal communities of this study.

5.4.1. CRITICAL CONSIDERATIONS – MARINE USES AND ACTIVITIES

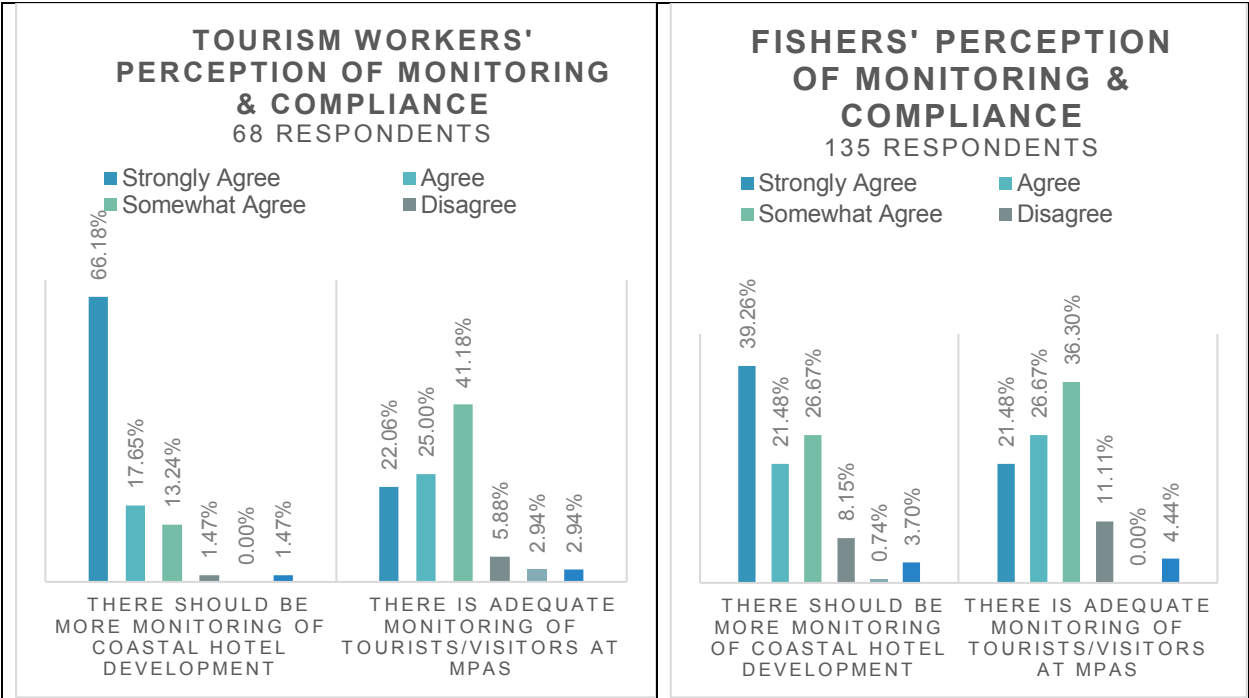
Critical Marine Species	<ul style="list-style-type: none"> ○ There are distinct marine species that are critical for tourism products in studying MPAs. Snorkeling is the most popular activity engaged by workers in this sector, which is consistent with the preferences of tourists ○ For fishers, marine product harvesting is their main activity, and the primary marine products harvested by fisherfolk are lobster and conch.
Seasonally Regulated Marine Operations	<ul style="list-style-type: none"> ○ Participants corroborate that they experience June, July, October and January as the busiest months for fishing activities. ○ Tourism workers are most active from November to April, with December reported as the most active month for tourism workers ○ Women from fishing participating households corroborated that they, too, experience that June, July, October and January tend to be the busiest months for fishing activities. However, they feel increasingly marginalised to undertake fishing or wild seafood harvesting as a leading source of livelihood.

5.5. GOVERNANCE AND MANAGEMENT

This section provides the data and findings on the institutional frameworks, policies, regulations, and management practices governing human interactions in the coastal and marine environments of this study. This data provides insights on the perceived effectiveness, transparency, and inclusivity of the governance structures and decision-making processes in the MPAs.

Monitoring of coastal developments: The respondents' perceptions of coastal monitoring indicate that they prefer more action in relation to monitoring for compliance. This is exceptionally high for tourism workers than fishers, possibly because tourism workers engage with these developments more regularly.

Figure 24: Perception of the Monitoring of Coastal Development by Cluster



Source: Socio-economic Monitoring Baseline Survey, 2023

Though both groups informed in the FGDs that they perceived an improvement in enforcement and management access (Figure 24), they did not consider this to be the result of consistent and meaningful monitoring but rather, that the level of monitoring observed was inconsistent and tokenistic on specific issues. Nonetheless, tourism workers and fishers strongly agree that coastal development should be monitored more. Both groups overwhelmingly concur that there should be more monitoring of tourists and visitors to the MPAs. This would also indicate that MPA Managers need to strengthen their engagement with stakeholders in the tourism sector.

Figure 25: Perception of Management Effort by Fisherfolk

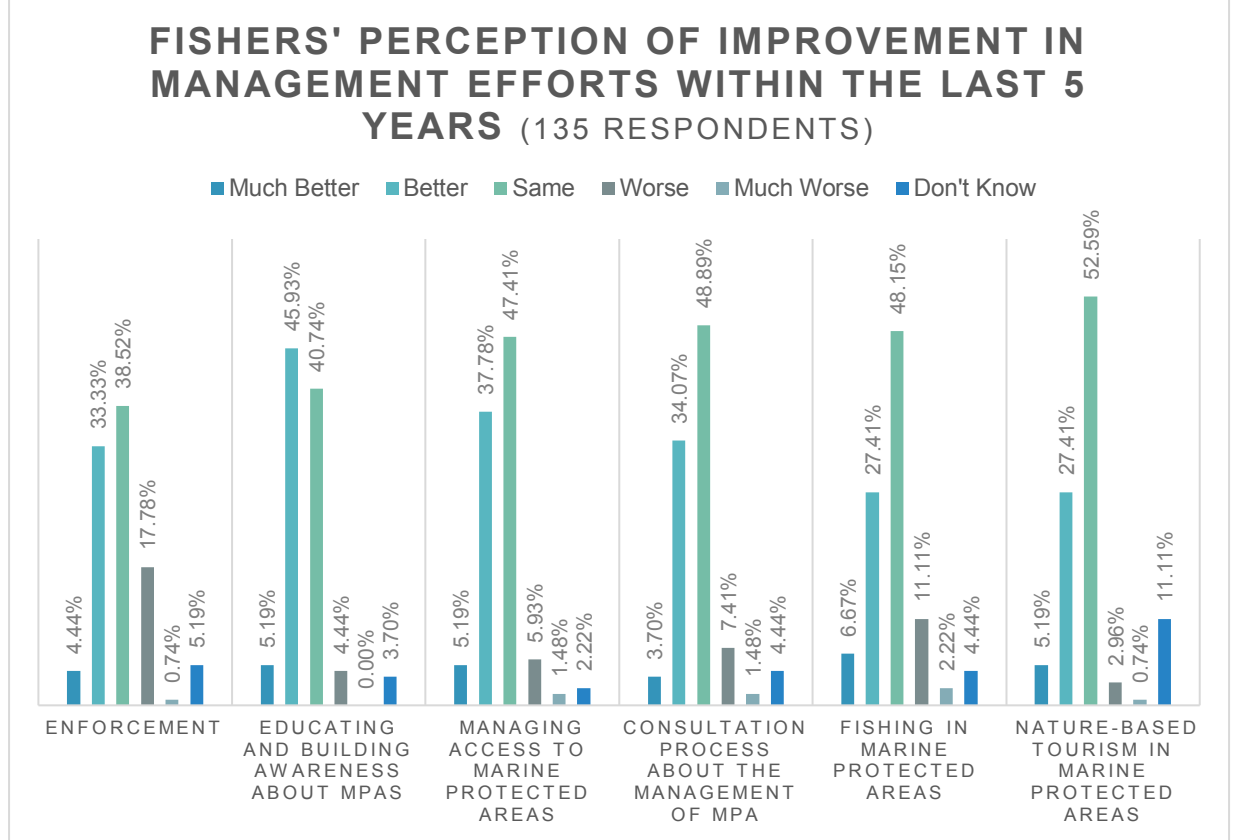
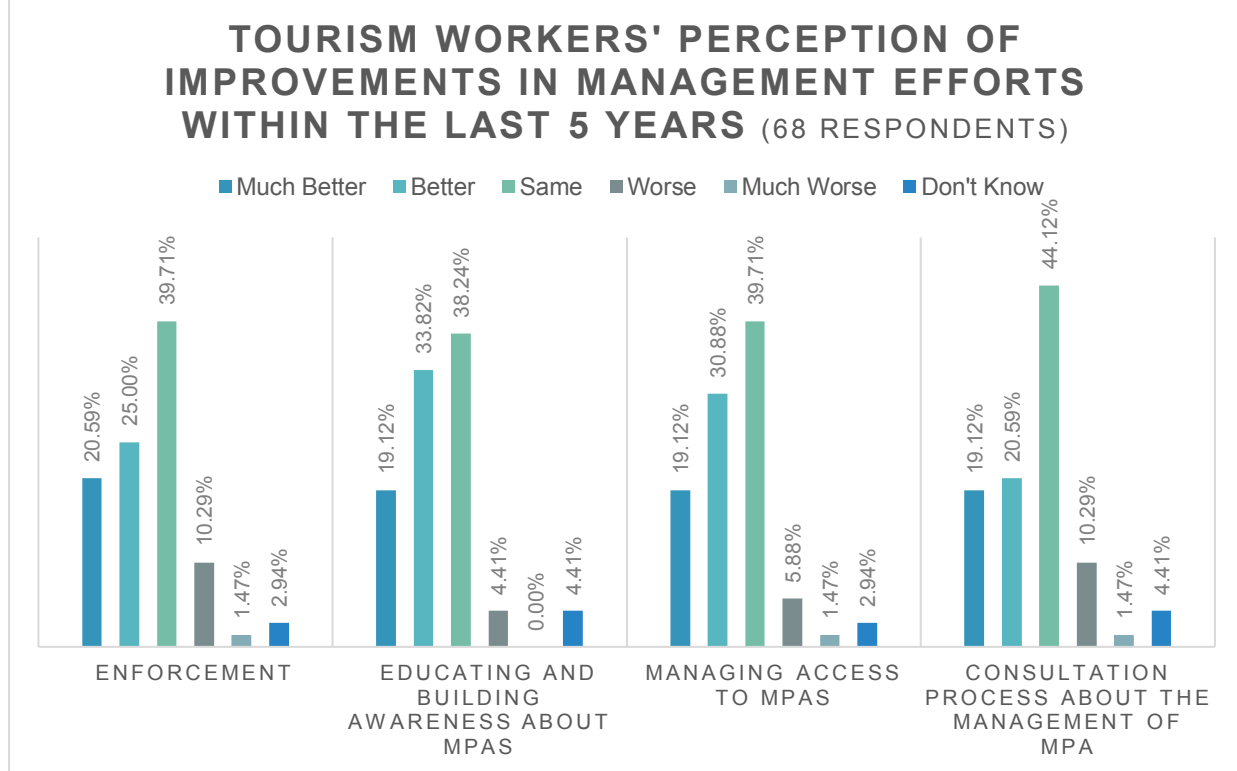


Figure 26: Perception of Management Effort by Tourism Sector Respondents



Source: Socio-economic Monitoring Baseline Survey, 2023

5.5.1. COASTAL COMMUNITIES' INTERACTION WITH REGULATIONS

Enforcing fisheries and tourism regulations in the governance of the resource and ecosystems use, can be met with opposition from coastal residents. In the FGDs several forms of resistance to fisheries and tourism regulations were identified when communicated by the respondents from the communities of the study. These findings provide some insights into the complexities of managing coastal resources in communities that rely heavily on marine resources and whose marine resource use practices are socially and culturally embedded.

Forms of Opposition

Participants expressed that they have demonstrated opposition to fisheries and tourism regulations in several forms.

- **Non-compliance:** Some residents openly and repeatedly defy regulations, engage in illegal fishing practices, overfish, and conduct tourism activities without the requisite authorisation.
- **Protests and Advocacy:** Community members have organised protests, demonstrations, or advocacy campaigns to challenge regulations perceived as unjust, unfair, or detrimental to their varied interests.
- **Litigation:** In some cases, coastal residents have resorted to legal action, filing lawsuits or legal challenges against regulations they deem unconstitutional or violating their rights.
- **Informal resistance:** Resistance to regulations also takes subtle or informal forms, such as passive non-cooperation or avoidance of compliance with specific measures.

Reasons for Opposition

The study unpacked that opposition towards fisheries and tourism regulations in the study communities can be influenced by various factors, some of which are listed below.

- **Livelihood dependence:** Many coastal residents depend on fishing and tourism for their livelihoods, and when regulations are perceived as restrictive or prohibitive, they consider that these will threaten their economic security and traditional way of life.
- **Lack of alternatives:** Respondents perceive that the limited access to alternative income-generating opportunities and lack of support for *costly* diversification and supplemental efforts leave them with few viable options for fishing and tourism.
- **Marginalisation:** Some residents perceive fisheries and tourism regulations as unfairly targeting local communities while exempting or turning a blind eye to the actions of more extensive commercial interests or foreign operators.
- **Exclusion:** In discussions and interviews, participants report that they do not feel adequately consulted on critical matters affecting their livelihoods. They also expressed that the low and sometimes selective representation for the development and implementation of regulations fosters experiences of discrimination, distrust, and alienation.
- **Enforcement challenges:** Weak enforcement, corruption, and the lack of resources undermine the effectiveness of regulations, leading to skepticism or disillusionment among coastal residents about marine protection and management.
- **Cultural and social Impacts:** Regulations that restrict traditional fishing practices, access to customary fishing grounds, or cultural practices are perceived by fishers as eroding cultural identity, social cohesion, economic rights, and community resilience.

Some of the opposition from fishers and tourism workers for marine regulations and policies reflects a complex interplay of economic, social, cultural, governance and institutional factors. Addressing the reasons for opposition requires a multifaceted approach that balances

conservation objectives with the coastal communities' socioeconomic needs and aspirations. Meaningful engagement, inclusive decision-making processes, equitable benefit-sharing mechanisms, and support for accessible and affordable supplemental livelihoods are essential to building trust and fostering cooperation in the communities that impact or are impacted by the MPAs of this study.

5.5.2. INFORMAL AND CUSTOMARY RULES

Among marine resource users, especially fishers, informal rules based on traditional practices, local knowledge, and community norms continue to be practiced. Some of these practices are also rooted in cultural heritage and socialisation common to the coastal communities in this study. These informal and customary marine rules are also norms among fishers, and some are detailed below.

Traditional fishing practices

- According to interviews and FGDs, fishers engage in traditional fishing practices passed down through generations, embodying a deep connection to the marine environment. Fishers believe that efforts should be made by MPA Managers to learn the value of these practices and adjust them as needed to suit environmental protection rather than instituting total bans that disregard their social and cultural relevance. FGD participants feel that when this is done, they are left with no or little alternatives which are either inaccessible or unaffordable to them.
- In fishing communities, involving family and children in fishing activities is a deeply engrained traditional and cultural practice among Garifuna, Kriol and Mestizo families. In FGDs, participants explained that some legislations have ignored this practice even though this is important for cultural longevity. From an early age, children and youth in these communities are introduced to living off the resources of the sea; it is also where they learn valuable skills, knowledge, and cultural traditions from adult family members. Through these practices, respect for nature and lessons on sustainable resource management are passed down to generations through storytelling and practical experiences at sea. These practices ensure the continuity of indigenous and Afro-descendant cultures and strengthen the social cohesion and resilience of fishing communities.

Community-based marine management

- During the FGDs in Belize City, it was recounted that some coastal communities in this study engage in a distinct style of community-based marine activity management. Here, local stakeholders collectively regulate fishing activities using informal rules and agreements enforced through social norms, peer pressure, and community cohesion.
- Coastal communities also engage in marine conservation management through a variety of grassroots initiatives and community-led practices that may include beach clean-ups (recently seen in the Sargassum clean-up initiatives), mangrove restoration projects, and coral reef monitoring programs that empower residents to take ownership of their marine environment and address threats such as pollution, habitat degradation, and overfishing. Moreover, informal networks of fishers, divers, and coastal residents share information, exchange traditional ecological knowledge, and collaborate on resource management strategies, fostering a sense of collective responsibility and solidarity based on their common

experiences with marine activities. Through these grassroots efforts, coastal communities demonstrate their commitment to marine conservation and sustainable livelihoods, leveraging their intimate connection to the sea to safeguard marine resources for future generations.

Marine tenure systems:

- Informal tenure systems, such as communal fishing grounds or traditional marine tenure arrangements, also govern the access to and use of marine resources in certain areas. These informal and arbitrary systems endow community members or households with control over access to marine areas according to known and longstanding social practices. In FGDs, participants indicated that some fishing areas with shade structures along some of the cayes in Belize and Stann Creek are socially known as belonging to households or boat captains. While no formal communication has been made in this regard, fishers recognize this form of informal ownership for these marine spaces, and this knowledge enacts a measure of social control over their behaviour and practices therein.

Informal Conservation Practices:

- There are taboos and unacceptable practices that are socially frowned upon among marine resource users of this study. These informal conservation practices may be socially induced prohibitions or restrictions on certain types of activities in specific marine areas to protect critical habitats, spawning grounds, or culturally significant species. One notable example is "catch and release," where fishers are expected to release certain species or catches back into the sea, particularly large or gravid (pregnant) fish, to allow them to reproduce and maintain healthy populations. Another common taboo is fishing during specific lunar phases or seasons when fish are spawning or migrating, ensuring that fish stocks can be replenished. Additionally, some fishing communities designate their own "no-take zones" (even though there are not established marine reserves) where fishing is strictly prohibited to protect known critical habitats, nurseries, and biodiversity hotspots.
- When used, traditional fishing techniques such as handline and trap fishing prioritise selective harvesting and minimise bycatch, reducing the ecological impact on marine ecosystems. Furthermore, cultural beliefs and ceremonies, such as rituals performed before fishing trips to honor the marine spirits or seek their protection, reinforce the spiritual connection between fishers and the sea. These practices also instill stewardship and respect for marine resources.

Conflict resolution mechanisms:

- Informal mechanisms for resolving disputes and conflicts related to marine resource uses are common in some coastal communities. These mechanisms typically involve mediation by community leaders, elders, or respected individuals who help build consensus and restore stakeholder harmony.

Knowledge sharing and traditional ecological knowledge:

- Informal networks for knowledge sharing and transmission of traditional ecological knowledge (TEK) play a vital role in governing marine resources. Elders and experienced fishers pass on knowledge about fishing techniques, ecological indicators, and resource management practices to younger generations. In FGDs, boat

captains shared that they also take on training and teaching responsibilities with younger fishers, especially family members.

5.5.3. CRITICAL CONSIDERATIONS – GOVERNANCE MANAGEMENT

<i>Knowledge of governance structures</i>	○ Knowledge of governance structures, including official legislation and policy frameworks, need to have greater influence on the actions of fishers, tourism workers and households that impact MPAs
<i>Influence of informal and traditional governance systems</i>	○ Informal and traditional practices continue to influence organising behaviour and wild seafood harvesting practices in the areas around the MPAs of this study.
<i>Perceptions of management presence</i>	○ The stakeholders in the MPAs of this study acknowledge the field and monitoring presences of the MPA managers. However, these are still considered to lack regularity and consistency across the MPAs.
<i>Community engagement in governance</i>	○ Capacity building, training, and exchange opportunities between stakeholders of the MPAs under study are critical to deepening governance competencies and familiarity with management structures and institutions, including traditional and cultural practices.

The presence of formal governance mechanisms and informal and customary marine rules have *joint* influence on the practices, behaviors, and marine resource management traditions in coastal communities. Management efforts that acknowledge and account for informal and traditional practices around MPAs can also enhance local participation and promote social cohesion, which are key elements of good governance. At the same time, strengthening enforcement capacities and governance structures are essential strategies to mitigate the threats to marine resources and the livelihoods of those who depend on them.

5.6. STAKEHOLDER ENGAGEMENT AND COMMUNICATION PREFERENCES

This section explores the information requirements, communication preferences, and participation choices of the stakeholders in this study. The data collected from respondents informs the topics that interest the communities the most and those that they consider essential. It also examines the various options available to MPA managers to enhance stakeholder engagement and participation for marine resource protection and conservation. This section also offers valuable insights into partnerships and adaptive management practices that can contribute to the long-term social acceptance of compliance in the MPAs.

Respondents were asked what information was most vital for them to know, and based on the responses provided, all the respondent groups showed that the options provided to them were all important, expressed by their high selection rate of over 50%. These responses, as shown in **Table 6** indicate that the stakeholders desire information on many topics. All the below topics returned high to moderate rates of interest across all the groups.

Table 6: MPA Topics of Interest Among Marine Resource Users

Topics of Interest	Households	Tourism	Fisherfolk
	<i>Based on respondents' selection of "Very Important" Range: Low:0-33%, Medium: 34-66%, High:64-100%</i>		
<input checked="" type="checkbox"/> Fish behaviours	Medium	High	High
<input checked="" type="checkbox"/> Tides, channels, currents	Medium	High	High
<input checked="" type="checkbox"/> Marine inventory (products and services)	Medium	High	High
<input checked="" type="checkbox"/> Fragile and vulnerable marine areas	Medium	Medium	High
<input checked="" type="checkbox"/> Types and locations of different species	Medium	High	High
<input checked="" type="checkbox"/> Impact of fishing on MPA resources	High	High	High
<input checked="" type="checkbox"/> Impact of tourism on the role of marine and coastal areas	Medium	High	Medium
<input checked="" type="checkbox"/> Role of nature-based tourism	Medium	High	Medium
<input checked="" type="checkbox"/> How the area is being managed	Medium	Medium	High
<input checked="" type="checkbox"/> MPAs description and resources	Medium	Medium	High
<input checked="" type="checkbox"/> Who manages the MPAs?	High	High	High
<input checked="" type="checkbox"/> MPA management activities	Medium	Medium	High

The high level of interest in learning more about the topics presented above means that MPA managers can plan to engage communities, fishers, and tourism workers on these matters regularly. From **Figure 27 to 31**, the results also inform the extent and types of information needed by the respondents.

Figure 27: Respondents Preferred Information Needs (Types and Locations of Different Species)

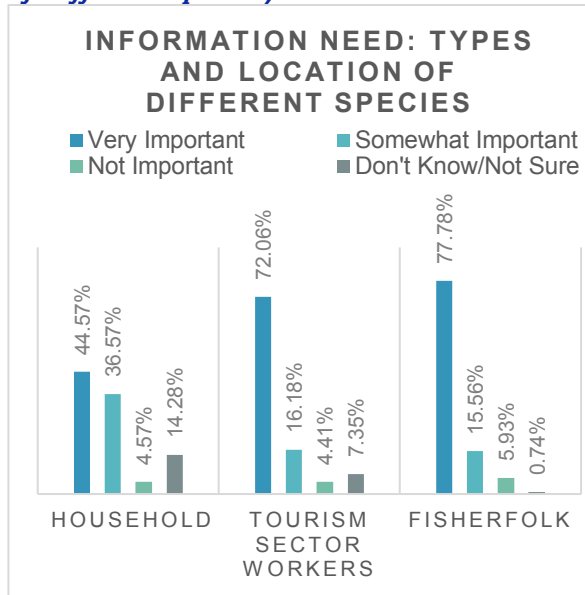


Figure 28: Respondents Preferred Information Needs (Tides, Channels, Currents)

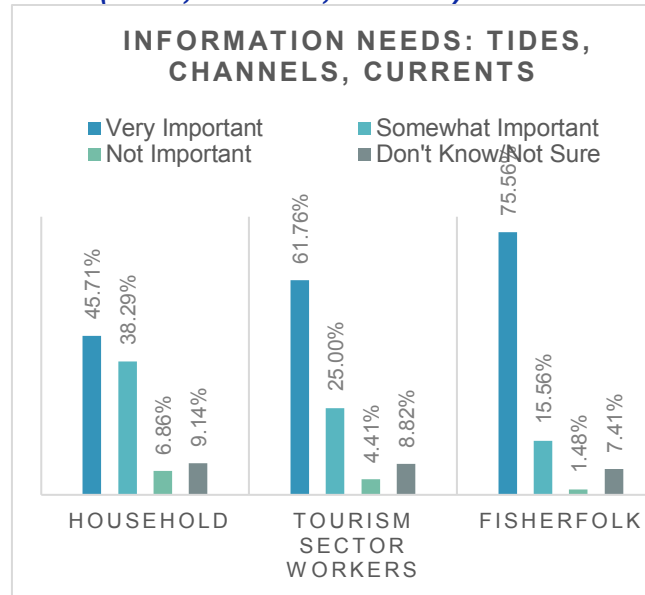


Figure 29: Respondents Preferred Information Needs (Marine Inventory-Products and Services)

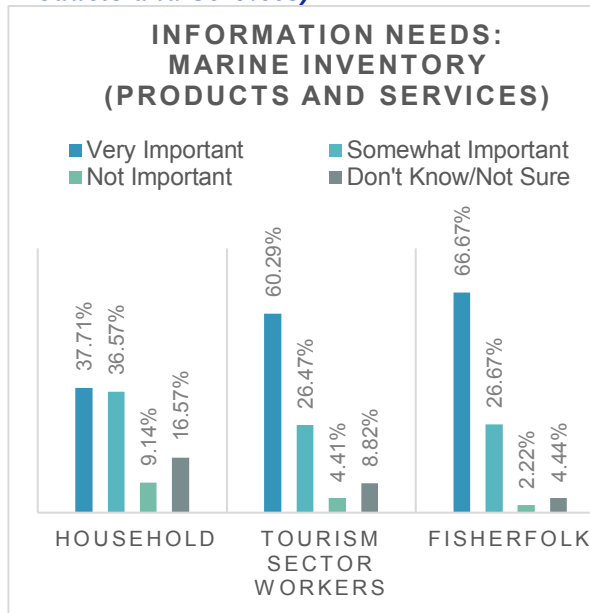
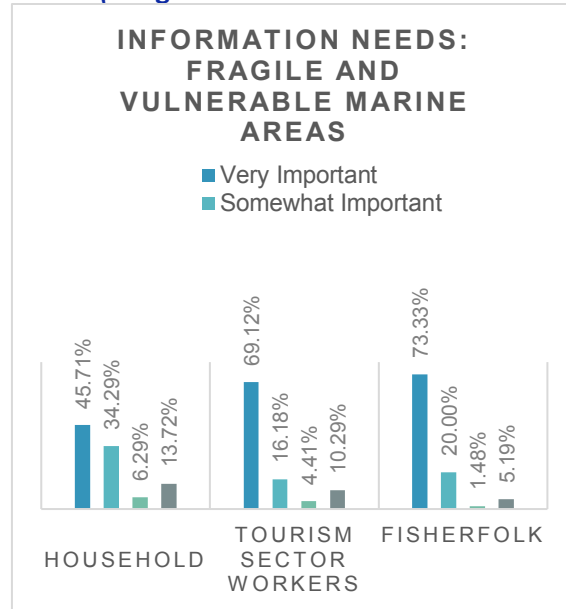


Figure 30: Respondents Preferred Information Needs (Fragile and Vulnerable Marine areas)



Community Engagement Preferences

When analysing their engagement preferences, it is essential to consider the groups' demographics. Fishers had more respondents over 50 who highly preferred participating in community meetings (63%), followed by consultations (62.22%). However, this doesn't mean that all engagement activities with fishers should be conducted in face-to-face sessions, as **Figures Figure 31 - Figure 34 demonstrate**. For instance, they also indicated that they prefer to learn about MPAs mainly through radio/TV information and advertisements (64.44%), followed by radio talk shows and news releases equally (57.78%), and interestingly, WhatsApp broadcast messages (56.30%). Fisher's preference for communication by telephone is corroborated by the

survey responses indicating that the phone is one of their most valued assets. They will also likely use Facebook (60.00%) as their preferred social media platform.

Tourism workers also highly prefer community meetings, public forums, and consultations. They also prefer to be engaged in the communities through education campaigns, mostly through live community events and community project work. Tourism workers overwhelmingly prefer to learn about MPAs from social media posts (76.47%), such as Facebook. Like fishers, tourism workers also favor television talk shows (58.82%) radio talk shows as well as radio and TV ads equally (54.41%) for community engagement activities. However, tourism workers overwhelmingly prefer Facebook (62.67%) over Instagram (13.33%) through which to receive communication messages.

Figure 31: Respondents' Preference for Community meetings

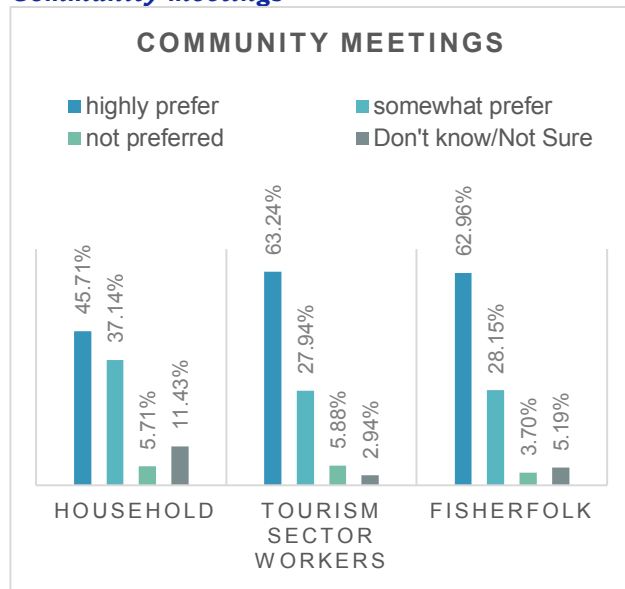


Figure 32: Respondents' Preference for Participation in Community project work

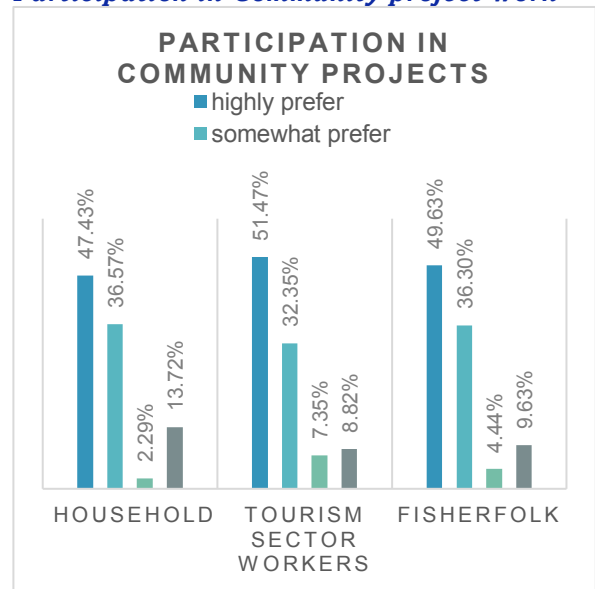


Figure 33: Respondents' Preference for Virtual Meetings

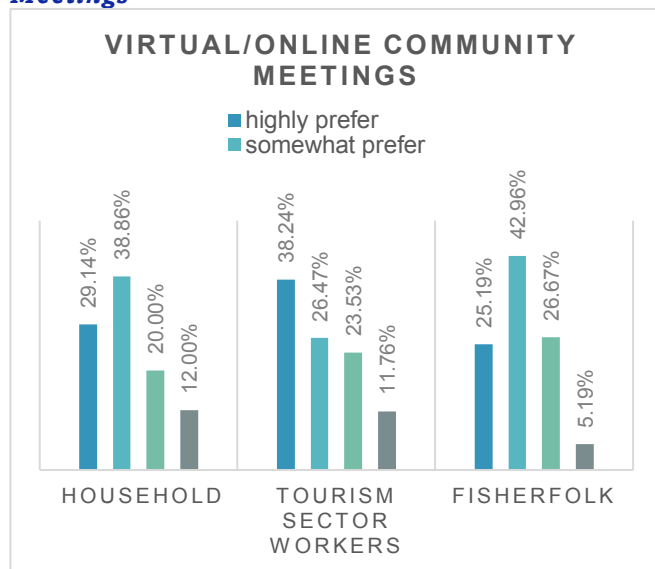
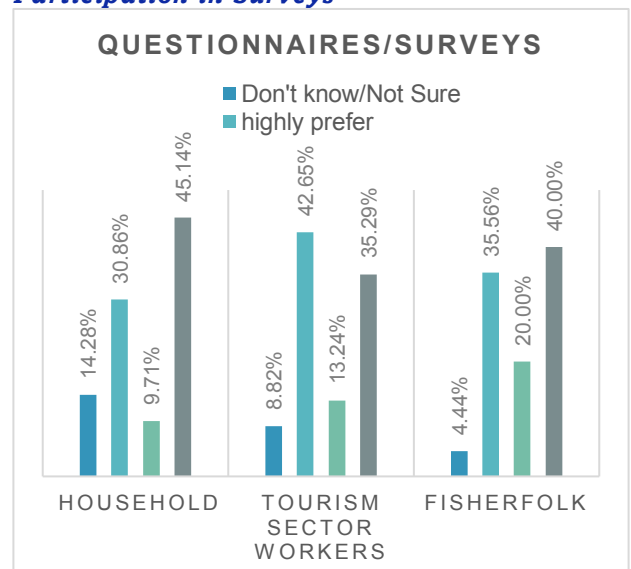


Figure 34: Respondents' Preference for Participation in Surveys



In addition to radio and talk shows, respondents at the household level prefer to be engaged through community project work, community meetings, and public forums. They express a high preference for communication through news releases, educational activities and newsletters.

Figure 35: Respondents' communication preferences (Radio Talk Shows)

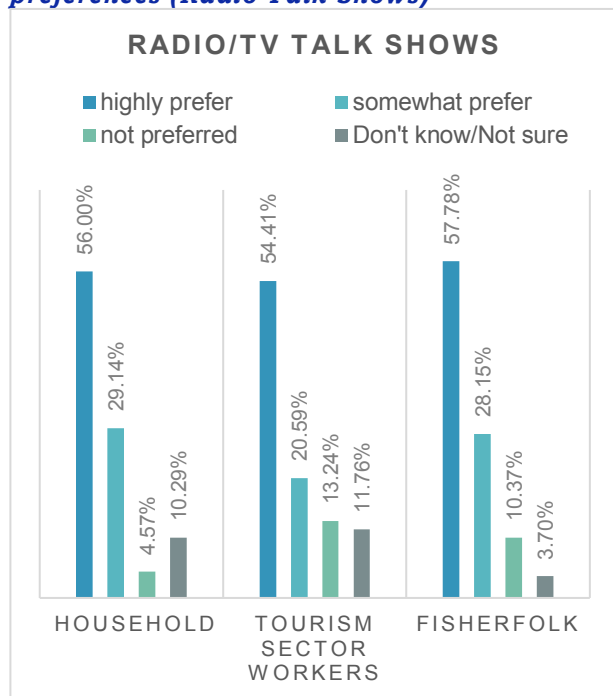


Figure 36 Respondents' communication preferences (Social Media Platforms)

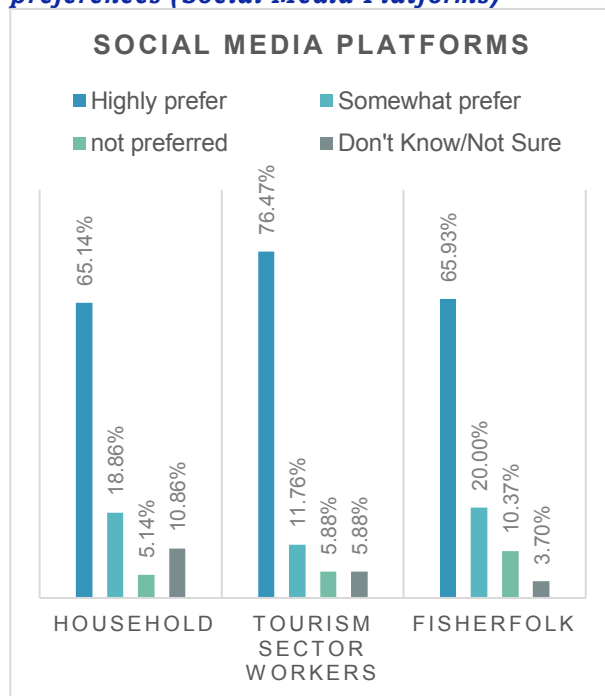


Figure 37: Respondents' communication preferences (WhatsApp Messages)

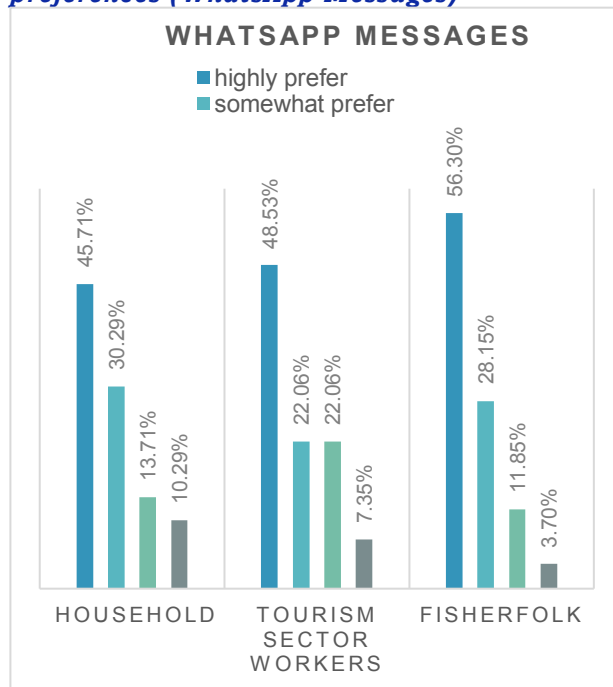
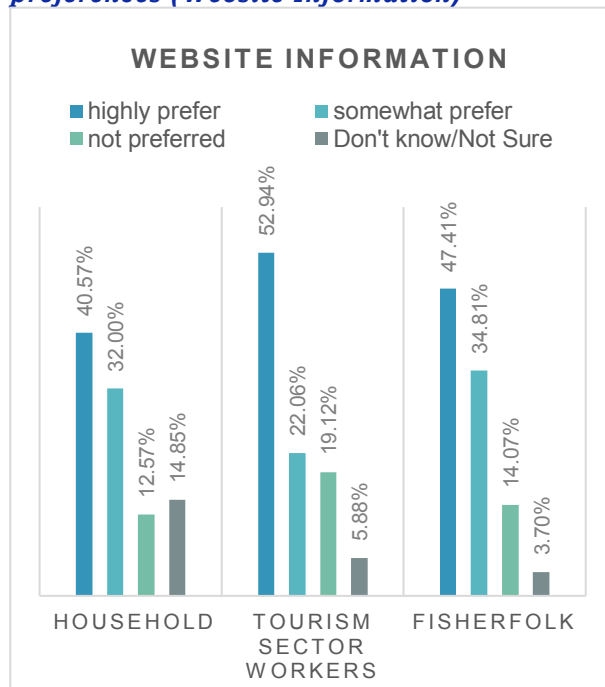


Figure 38: Respondents' communication preferences (Website Information)



Local engagement and information sharing preferences are important matters for communication with all the groups involved in this study. This is reiterated by the high selection of all the topic options presented in the survey (See Table 7). Regarding engagement preferences, however, the

respondents place value on community level activities, i.e. activities within the physical communities of origin and engagement activities with stakeholder groups versus individual-based approaches. While there will be a need for individual engagements even at the community level, respondents voice that a more communal approach generates spaces for equal access to information without marginalising any group.

FGD participants also voice that they perceive that they could be penalised if they are too zealous when they engage in public consultations. Though still their preferred means of receiving information, fishers express that consultations do not always provide a safe space for them and that they can become a “target” by rangers and government officials for publicly voicing irregularities, disparities, and the heavy-handedness of officers. However, they expressed the need for meaningful inclusion in decisions regarding their livelihoods.

Fishers expressed that they believe stakeholder participation is essential to sustainable development. However, they have experienced limited stakeholder participation where their views are honored or respected. In the FGDs, they were aggrieved by the numerous times they requested representation, but these efforts were ignored. One fisherman reported being part of several consultation meetings for MPAs and managed access. However, he saw the implementation of these regulations as a top-down approach and perceived that the consultation process was merely a token exercise. While the male fishers were discontented about the lack of attention and actions to their contributions in consultations, fisherwomen voiced that they were not consulted on many management decisions and were unaware of regulations and changes that directly impact them and their livelihoods. In the FGDs, fisherwomen stated they were not consulted on important management decisions and lacked access to decision-making opportunities for marine conservation and sustainability. They feel that the meetings they attend are not sufficiently responsive to the concerns and aspirations they communicate.

All participants in the study recognize that they need information about matters that will directly impact their livelihoods. They also acknowledged that this information should be developed and delivered through the multiple and accessible formats that the groups have communicated work best for them. In-person engagement sessions need to be facilitated and structured with tools and methodologies that are inclusive, open, and non-threatening. The study also points out that engagement with communities can be fostered and nurtured through community projects, education and outreach sessions, and social media.

5.6.1. CRITICAL CONSIDERATIONS – COMMUNICATION PREFERENCES

Communication for Livelihood ○ Stakeholders need information that supports their livelihoods – fishing and tourism. This information should be developed and delivered in multiple, accessible formats that the groups have communicated work best for them.

Engagement through Community Projects ○ Engagement with communities can be fostered and nurtured through community projects, education, and outreach sessions. They also prefer group-focused activities versus an individual approach. A more communal approach generates spaces for equal access to information without marginalizing any group.

6. RECOMMENDATIONS

This socioeconomic study of fishers, tourism workers and households from communities that impact the five MPAs – TAMR, BHNM, HMCNR, SWCMR, and PHMR - shows that there are distinct practices, experiences and perceptions emanating from their significant and direct reliance on these marine resources. Hence, in this first instance, the recommendations presented here are linked to the findings of the baseline study of the socioeconomic factors in the MPAs. Recommendations for the consistent monitoring of these communities and stakeholders are made in the section that follows. All recommendations can inform programming and management priorities in the MPAs.

Livelihood longevity

- There is a need to increase opportunities that prolong income generation among fishers and tourism workers that will bridge the income gap which invariably occurs owing to the seasonal nature of jobs in these sectors. This is particularly crucial given that the primary income generating activities are most lucrative during four (4) months of the year.

Economic inclusion

- Even though mostly men are active in income-generating activities that are marine resource-intensive, training and mentorship programs to enhance the work that women already do to sustain and maintain fishing activities should be conducted. Such efforts will promote the sustainability of fishing and tourism activities that impact the MPAs most adjacent to this stakeholder group.

Resource management and conservation education

- Education on managing and conserving marine resources in adjacent communities by fishers and tourism workers who impact the MPAs needs to be strengthened and integrated in tandem with the enforcement of applicable regulations. For greater outreach on regulations, training among youth and university students active in the communities of impact could also improve inter-generational knowledge transfer and fishing skills-building. Such training should involve the contributions of fishers, especially as they are an ageing group and field-based approaches to learning may appeal more to them.

Community engagement

- Initiatives to enhance fisheries management that empower fisherfolk to participate in decision-making processes should be expanded through community-based approaches for fisheries and marine resource governance and which also acknowledge fishing traditions based on culture.

Gender-responsive policies and programs

- It is critically important for MPA managers to support the development and implementation of gender-responsive policies and programs for protected areas management. These should recognise women's unique roles and contributions and address their needs as legitimate participants in the economy of coastal communities, especially those in the MPAs of this study.
- Women's voices and perspectives should also be integral to decision-making processes at all levels of community governance participation in MPAs. Their participation and representation in these processes should be supported and integrated into programs and projects of the MPAs in this study.

Access to skills building and training

- MPA managers should also promote access to peer education and training opportunities for men, women, and youth in coastal and marine communities to strengthen sustainable economic opportunities and livelihoods from wild seafood harvesting. This would also enhance post-harvest activities that can also bridge the income gaps in all the communities of this study.

Knowledge sharing and traditional intellectual property:

- MPA managers should institute initiatives to acknowledge and integrate traditional ecological knowledge, cultural practices, and local innovation that have sustained the diversity and longevity of coastal communities.

The previous recommendations broadly address some actions that can be taken owing to the findings generated from the Baseline Socio-economic Monitoring Study. However, these results should also guide the overall monitoring of follow-up activities which will be conducted regularly based on the agreed standards and approaches instituted by the MPAN. Such standards should include the actions presented below.

- Establish a ***specific timeline for conducting socio-economic assessments*** in the individual MPAs and for the MPAs of this study. In specifying the timeframe for the study, MPAN should consider the seasonality of livelihoods and income-generating activities to avoid conflicts in scheduling and the availability of respondents.
- Create ***knowledge exchange spaces in communities*** to update stakeholders on the results of the socioeconomic monitoring studies. This feedback to the community should also be done in the context of project preparation or stakeholder engagement activities and not merely as standalone activities. By integrating community-based feedback sessions as part of stakeholder engagement activities, MPA managers can build trust with communities and resource users because they will see how the information they provide is used in projects and programs. This form of stakeholder engagement can also enable a broader understanding of the socioeconomic dynamics across the MPAs.
- Create and support a ***socioeconomic monitoring workgroup*** to plan and oversee monitoring in the MPAs of focus. This group should have in its terms of reference the systematic documentation of MPA managers' programming and project activities that directly contribute to the indicators assessed and the outcomes achieved.

7. CONCLUSION

The 2023 Baseline Socioeconomic Monitoring Report for the five Marine Protected Areas (MPAs) and the 21 coastal communities comprehensively delineates the intricate interplay between human activities, community well-being, traditional and social norms, and the management and conservation of marine resources. This report has been instrumental in mapping out the dynamic relationships among key stakeholders that influence the MPAs, enriching our understanding through thorough data collection, analysis, and robust stakeholder involvement. It not only sheds light on the prevailing challenges and potential opportunities for sustainable development initiatives but also emphasizes the necessity of adept and adaptive management strategies for MPAs. Such strategies are crucial to effectively harmonize social, economic, and environmental objectives, thereby fostering community engagement, empowerment, and resilience. This integrated approach is pivotal for the sustainable governance and conservation of marine ecosystems, ensuring their health and productivity for future generations.

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ANNEX 1: POPULATION SAMPLE

The research team collected responses from 378 individuals. They surveyed 175 households in 19 out of 21 communities; however, no households were sampled from Barranco and Riversdale owing to the unavailability of respondents and our inability to establish contact there despite repeated attempts. The Fisherfolk Survey had the largest sample size, with 135 respondents, but there were no respondents from Cattle landing despite repeated attempts to complete the survey there. The tourism survey was the most challenging, with only 68 respondents interviewed, representing less than 50% of the target sample size. This data was collected up to November 23rd, 2023.

Table 7 shows the summary of data collected on 23rd November 2023

SUMMARY OF DATA COLLECTION			
23 rd November 2023			
TYPES OF SURVEYS	Number of Respondents	Percentage Respondents	Target Total
HOUSEHOLD	175	113.64%	154
TOURISM	68	53.96%	126
FISHERFOLK	135	103.84%	130
TOTAL	378	91.74%	412

Table 8 shows the sample size per survey instrument

HOUSEHOLDS SURVEYS

#	Community	DATA COLLECTED	TARGET #
1	Barranco	0	6
2	Belize City	11	8
3	Cattle Landing	4	6
4	Caye Caulker	11	8
5	Chunox	11	8
6	Copper Bank	13	8
7	Dangriga Town	6	8
8	Forest Home	4	6
9	Hopkins	6	8
10	Independence	16	8
11	Libertad	12	8
12	Monkey River	5	6
13	Placencia	11	8
14	Progreso	19	8
15	Punta Gorda	11	8
16	Punta Negra	4	6
17	Riversdale	0	6
18	Sarteneja	9	8
19	San Pedro	9	8
20	Seine Bight	5	8
21	Yemeri Grove	8	6

TOURISM SURVEYS

#	Community	DATA COLLECTED	TARGET #
1	Barranco	0	2
2	Belize City	8	8
3	Cattle Landing	0	2
4	Caye Caulker	7	8
5	Chunox	1	8
6	Copper Bank	2	8
7	Dangriga Town	2	8
8	Forest Home	0	2
9	Hopkins	5	8
10	Independence	7	8
11	Libertad	2	8
12	Monkey River	6	2
13	Placencia	5	8
14	Progreso	2	8
15	Punta Gorda	7	8
16	Punta Negra	0	2
17	Riversdale	1	2
18	Sarteneja	2	8
19	San Pedro	8	8
20	Seine Bight	2	8
21	Yemeri Grove	1	2

Sub-Total 175 154

Sub-total 68 126

FISHERFOLK SURVEYS

#	Community	DATA COLLECTED	TARGET #	#	Community	DATA COLLECTED	TARGET #
1	Baranco	2	2	12	Monkey River	10	8
2	Belize City	9	8	13	Placencia	9	8
3	Cattle Landing	0	2	14	Progreso	9	8
4	Caye Caulker	10	8	15	Punta Gorda	8	8
5	Chunox	9	8	16	Punta Negra	1	2
6	Copper Bank	9	8	17	Riversdale	1	2
7	Dangriga Town	11	8	18	Sarteneja	11	8
8	Forest Home	0	2	19	San Pedro	7	8
9	Hopkins	11	8	20	Seine Bight	3	8
10	Independence	7	8	21	Yemeri Grove	3	2
11	Libertad	6	8		Sub-total	135	130

The response rate for the survey was highest in the southern region because this region comprised 13 communities, which was more than two times the number of communities of impact in the other areas. There were five targeted communities for the northern region and three (3) targeted communities from the central region. The sample population for the tourism survey was the lowest overall, with only 68 respondents. In the southern region, there was zero representation for the tourism sector for Barranco, Cattle Landing, Forest Home, and Punta Negra communities. The Fisherfolk Survey received 135 sample representations, except in Cattle Landing and Forest Home, where there was zero (0) representation of fishers from these communities. Multiple attempts were made to execute these surveys but none secured any respondents.



Turneffe Atoll
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