DIVING IN: LEARNING BEST PRACTICES FROM BELIZE’S MANAGED ACCESS PROGRAM FISHERIES POLICY

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DIVING IN: LEARNING BEST PRACTICES FROM
BELIZE’S MANAGED ACCESS PROGRAM FISHERIES
POLICY

BY
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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
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OF

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ABSTRACT

Belize has recently transitioned from an open access fisheries management regime to a program called Managed Access, based on a form of spatial management known as Territorial User Rights for Fishers (TURFs). Coastal communities rely on fishing activity for a variety of reasons including food and job security. Community well-being refers to the holistic definition of the human state, indicated by a variety of socioeconomic factors. This multi-strategy research with a concurrent nested design looks at a combination of interview and archival document data, along with demographics from the Statistical Institute of Belize in order to understand the impacts of the management shift on coastal fishing communities. The findings from this study may allow for critical insight regarding changes in community well-being as a result of its fisheries management implementation, which could help build a holistic framework for the fisheries policy decision making process.
I would like to acknowledge and express my deepest gratitude for those who have had a hand in this journey with me. First, I want to thank my advisor Dr. Melva Treviño Peña for all of her guidance and support for this project. Her help during this process has been tremendous and I could not have done it without her. I also want to thank my committee for their support and willingness to jump on board. To the Marine Affairs faculty, thank you for all of your time and energy spent teaching as well as mentoring myself and the other students. A particularly big thank you to those faculty members that stepped in when Melva was unable to, your support during that time was immensely appreciated. Of course I want to extend my sincerest appreciation to all of the interview participants in this project, because without them I would not have the project. From the National Institute of Culture and History Institute for Social and Cultural Research, I want to thank Mr. Rolando Cocom and Mr. Nigel Encalada for their support of the research. I also want to thank the Belize Archives and Records Services staff for their help and guidance with the project, as well as their help with a personal matter that occurred while I was on site. Their level of care, concern, and support was unmatched during a deeply stressful time.

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1. This Research Project

Fishing communities are dependent on fish stocks for various reasons, including but not limited to jobs, housing, food security, and nutrition, but are restricted through governing policies (Colburn et al., 2016). Increased poverty rates are too often stated as the result of decreased fishing productivity, but few researchers have used other socioeconomic indicators to assess overall community well-being. Poverty by itself is a mathematical measurement that fails to recognize the full complexity of community and individual well-being. Therefore, to gain a holistic understanding of how a community is responding to a change in fisheries management policy, it is essential to gather other forms of information such as the gross domestic product for the industry, population, unemployment rate, incarceration rate, total major crimes, educational enrollment, and direct insight from key informants. The country of Belize in Central America has recently moved from an open-access fisheries management regime to the Managed Access Program (MAP), based on the Territorial Uses Rights in Fisheries (TURFs) approach, in 2016 after a pilot launch in 2011. Given its relatively new implementation, there have been few studies focused on the social aspects of the new management structure. Therefore, the aim of this thesis was to use secondary data in the form of archive and census documents along with key informant interviews to gain an understanding of the social impacts of Belize’s Managed Access Program.
To gain this understanding of social impacts, I started with a broad question which was:

What are the socioeconomic impacts of fisheries management policies?

After preliminary research and multiple discussion with peers, faculty members, and my advisor, I began to think of this question relative to Belize in three parts:

1. What was the socioeconomic status of coastal communities in Belize before the 2011 pilot launch of the Managed Access Program and the national roll-out of the 2016 Managed Access Program policy?

2. How did the national policy impact these communities in regards to socioeconomic prosperity?

3. How do Belizeans, fishers, non-fishers, and fisheries experts perceive this management shift?

With all of these questions in mind, I formed an approach to maximize efficiency in data collection because I knew I wanted multiple perspectives to form a holistic narrative. I began by gathering demographics through the Statistical Institute of Belize, to which I then embarked on a month-long adventure to Belize to collect archival documents and conduct interviews with key informants. Upon collecting the three forms of data, I transcribed the interviews, organized archive files, and created tables for the demographic statistics. After all of the data was transcribed and organized, I started analyzing the content from the interview and archive materials by coding using the Dedoose™ software. From these codes, I was able to identify key themes that helped shape a narrative. For the demographic statistic tables, I was able
to analyze them by creating graphical representations to highlight trends. The data suggests that before the MAP, certain fishing communities were economically prospering, leading to various social benefits. Overall, the results suggest increased community well-being after the MAP implementation.

International fieldwork, especially that relating to fisheries, is important for domestic policy and decision making. Fish are mobile and move between geographical boundaries making it critical to understand how fisheries are managed in countries outside of our own. The findings from this research highlight the roles that government and non-government organizations have in fisheries management in Belize, along with the implications and areas for concern regarding socioeconomic prosperity in fishing communities. Belize’s fisheries management transition is relevant to the international community and specifically to United States domestic policy because of commonly shared fish stocks and the TURFs management approach. While Belize is not the only country utilizing a TURFs approach, it is important for other nations contemplating the management style to understand the socioeconomic impacts of the transition.

2. Positionality Statement

Before diving into the rest of this thesis, I would like to take the time and opportunity to state and acknowledge my position in this research as an outsider to Belize. I am a white American (settler) female who conducted research in a foreign country with a history of colonization and a population predominantly comprised of persons of color
Latino, Creole, Maya, and Garifuna are the four largest ethnic groups, with Latino making up 49-50% of the population (World Population Review). English being Belize’s official language, was one of the reasons I chose to focus my research there since I speak no other language fluently. In March of 2019, myself and a small group of students from my undergraduate institution, Saint Mary’s College, embarked on a research trip to the South Water Caye off the coast of Dangriga, Belize, as part of a study abroad program called IZE Belize. My short time spent there inspired me in my graduate student endeavors at the University of Rhode Island as I moved forward with thesis ideas. However, despite my reasons for choosing Belize as the focus of my research, the country comes with a history of colonialism, which is an important layer to understand as an outsider. I did not know Belize’s colonial history before traveling there to collect data, and as a researcher, it is important for me to understand the area I am studying. My position as an outsider can potentially impact the work I am aiming to do for the purpose of this thesis and thus is critical to acknowledge.
1. **Territorial User Rights for Fishers**

   There are three primary forms of property rights regarding fisheries management -- individual use rights, territorial user rights for fishers (TURFs), and community co-management (Wade et al., 2019). TURFs is a form of spatial property rights where individuals and or groups are given access and exclusive fishing rights to designated geographic areas (Wade et al., 2019; Nguyen Thi Quynh et al., 2017). With those rights, resource users can control access to the resources found within the boundaries of the defined ‘territory,’ as well as the intensity of usage and the selling or leasing of resource rights (Nguyen Thi Quynh et al., 2017). With well-established and defined property rights, TURFs move to eliminate the ‘race to fish’ phenomena and its consequences, incentivizing fishers to sustainably manage their fisheries (Nguyen Thi Quynh et al., 2017). This makes TURFs an ideal management strategy for predominantly small-scale fisheries where ill-defined property rights are more common, and overexploitation is occurring as a result (Nguyen Thi Quynh et al., 2017).

2. **Small-Scale Fisheries**

   Small-scale fisheries (SSFs) are not universally defined. However, they are often characterized by multiple species of interest, various landing sites (which increases the difficulty in recording catch and effort), low levels of fisher capital investment and limited power of the fishers to influence fish markets (Wade et al., 2019, pg. 2). The
United Nations Food and Agriculture Organization provides a broad definition of small-scale fisheries in which they are characterized by small vessels and small gear size (FAO, 2014). The objective of small-scale fishing can be recreation, leisure, sport, or personal consumption (Cooke & Cowx, 2006). Unlike SSFs, small-scale, commercial fishing is “conducted specifically to capture fish products for sale” (Cooke & Cowx, 2006, pg. 93). SSFs often lack a formal data collection system, face high levels of uncertainty, and are statistically underperforming regarding conservation, food production, profit-generating capacity, and the quality of the livelihoods they can support (Karr et al., 2017, pg. 2; Wade et al., 2019). By contrast, specific SSFs are deemed successful based on attributes such as strong leadership, co-management, secure catch, and scientific assessment of fishery status (Karr et al., 2017).

3. Belize’s Background

On the eastern coast of Central America sits the country of Belize, an English-speaking nation surrounded on three sides by southern Mexico, Guatemala, and Honduras and with 475 km of coastline of the Caribbean Sea (Perez, 2009; Fujita et al., 2017). Belize was once known as British Honduras, a British colony, and because of this, it is the only Central American country whose official language is English (Mwakikagile, 2014). Before it was colonized by Britain, it was an “integral part of the Maya empire,” starting around 2500 B.C. peaking between 800 and 1200 A.D., and starting its decline in the 10th century (Mwakikagile, 2014, pg. 11). Northern European countries (Britain, France, and The Netherlands) showed powerful interest in
forming their own colonies in the region in the 17- and 1800s, eventually leading to the official declaration of the colony of British Honduras in 1840 (Mwakikagile, 2014). During this time of British colonialism, particularly in the 1900s, national lobster and conch production fell on three separate occasions: in the early 1950s, the late 1960s, and the early 1980s (Huitric, 2005). The colonial government established a fisheries management framework in 1950 by appointing a Fisheries Officer to collect data and monitor the stocks (Huitric, 2005). In 1952 the Fisheries Unit was created, which established fishing and boating licenses (Huitric, 2005). Around a century after Britain’s initial colonial claim, in the 1950s, the People’s United Party (PUP) was formed, which brought forth a “national movement demanding independence,” eventually leading to the gaining of their independence in 1981 (Mwakikagile, 2014, pg. 45). After gaining independence, lobster and conch production was relatively stable (Huitric, 2005).

Belize is home to the world’s second-largest barrier reef, the Mesoamerican Barrier Reef System, which includes marine habitats such as mangroves, seagrass beds, fringing and patch coral reefs, and offshore atolls (Fujita et al., 2017; Alves, 2021). With this rich biodiversity comes an abundance of diverse goods and services, including services that generate economic growth, such as tourism and fishing (Fujita et al., 2017, pg. 138). Before the 20th century, the act of commercial fishing was limited to a few people in the Belize City area, and there were “too few markets for fish in the colony,” which severely limited the number of individuals that could make a living
from fishing (Huitric, 2005, pg. 10). In the 1980s, Belize saw a rapid increase in tourism which increased the market production and as a result, increased the number of fishers, despite the already declining fish stocks (Huitric, 2005).

A. Economics/GDP

Aside from national production destined for the tourism sector, Belize is a major exporter of seafood products. According to the Observatory of Economic Complexity (OEC, 2019), Belize's exports accounted for a total of USD 319 million in 2019. Non-fillet frozen fish was the fourth highest export, and seafood exports made up $104,205,200 million of that year’s total (OEC, 2019). The Food and Agriculture Organization of the United Nations GLOBEFISH data market profile for Belize lists the top ten seafood import products, most of which are differently prepared shrimps and prawns (FAO GLOBEFISH, 2018). Prepared in this context refers to the cut (i.e., pieces v. wholes), the temperature (i.e., chilled or frozen), and other differences in production such as the product being live, fresh, salted, dried, or smoked (FAO GLOBEFISH, 2018). The two most “economically important wild captures” are the Caribbean spiny lobster (*Panulirus argus*) and queen conch (*Lobatus gigas*) valued together at approximately USD 11.25 million (22.5 million Belizean dollars) (McDonald et al., 2017). This is further supported by the same FAO market profile in the exports products section, where five differently prepared lobsters make the list of ten and with conch ranking at the number two spot for the top ten products (FAO GLOBEFISH, 2018).
4. Historically Managed Areas in Belize’s Waters

In the 1980s, the Belizean government embraced the concept of marine protected areas (MPAs) as they designated the first MPA in the country, the Half Moon Caye Natural Monument (Cho, 2005). By the year 2002, thirteen more MPAs were created to conserve and protect marine areas, improve habitats for fisheries, and enhance tourism (Cho, 2005). In 1989, the Fisheries Department and local non-government organizations decided that an integrated approach would be best for the management of coastal and marine resources due to “cross-cutting management challenges” (Cho, 2005, pg. 934). This ultimately led to the formation of the Coastal Zone Management Unit (CZM Unit) but was met with pushback from a singular group – fishers. Members of fishing communities and cooperatives in Belize believed they would experience severe fishing restrictions due to the proposed strategies. This matter seemed to be resolved through multiple consultations and educational programs with members of the fishing communities (Cho, 2005). From Belize’s integrated approach, which utilizes co-management from the government and NGOs while also relying heavily on stakeholder engagement, objectives for the MPAs were adapted. These objectives led to establishing specific types of each MPA, ranging from no-take zones that do not allow any type of extraction to multiple use zones that allow for a multitude of activities (Cho, 2005). Specifically, there are General Use Zones where extraction takes place, Replenishment Zones where only non-extractive activities can occur, and Preservation Zones, which are only open to research activities (Alves, 2021). The Integrated
Coastal Management style for these MPAs led to the creation of nine designated coastal planning regions based on geographical and cultural features (Cho, 2005). Each of those nine regions has different guidelines based on their sustainability for development, which improves the management of development activities (Cho, 2005).

Before 2011, Belizean fisheries were managed under an open-access regime in which effectively zero regulations existed to prevent or restrict the number of people fishing or how much they were catching (Foley, 2012). Under the open-access regime, illegal fishing flourished because no incentives existed to aid in accomplishing stewardship and compliance with marine reserve regulations. Due to this, legal fishers felt the need to keep up by over-extracting, disobeying size limits, and ignoring seasonal restrictions (Foley, 2012, pg. 2). As a result of the open-access regime and its unintended consequences, the fisheries showed signs of overexploitation (Foley, 2012). There was a 30% increase in the number of fishers from 2004 to 2008, accompanied by a much smaller increase in overall catch by 2.42%. This lack of a substantial increase in catch despite a substantial addition of fishers suggests that too many fishers were chasing too few fish (Foley, 2012).

5. Managed Access Program in Belize

After 2011, Belize transitioned from the open access system described in the previous section to the Managed Access Program (MAP), a management regime based on the Territorial User Right for Fisheries (TURF) model. This transition came after several management conservation actions prompted by scientific monitoring efforts
over the previous decade (Fujita et al., 2017). The utilization of the TURF system came from the desire to eliminate the “race to fish” phenomena occurring under the open-access regime (Alves, 2021; Foley, 2012). The first two pilot sites of the MAP – Glover’s Reef and Port Honduras were established in 2011 to “assess the effectiveness of creating secure access rights to fishing grounds” (Fujita et al., 2017). These two sites were chosen based on the historical use of those fishing areas as well as a vetting process that ensured fishers entering these sites met a certain criterion, including proof of both residency and sale of fishery products (Fujita et al., 2017, pg. 138; Fujita et al., 2018; Belize Fisheries Department). The two pilot sites are also paired with two MPAs in southern Belize. This trend influenced the creation of fishing areas later in the country-wide implementation of the program. Two years into the program, notable improvements were reported in the pilot stage of the MAP sites using several metrics, including higher catch reportings, increased regulation compliance, and a decrease in violations (Fujita et al., 2017). The pilot sites were deemed successful, which led to establishing a co-management approach spearheaded by the Belize Fisheries Department with NGOs as co-managers to implement a national managed access system (Fujita et al., 2017). In 2016, the Managed Access Program was implemented nationwide, and the managed areas incorporated MPAs that had been previously established prior to even the pilot stage (Fujita et al., 2017; Figure 1; Figure 2).

The MAP and TURFs are not synonymous with each other. The TURFs act as the MA program's basis, which is unique to Belize. TURFs only refers to the spatial
management aspect of the program, as Belize is in charge of mandating the exact restrictions for those spaces (Guerrero et al., 2021). Another unique part of the program are the managed access committees, which were the first things formed during the initial pilot stage of the program (Fujita et al., 2017). The committees evaluate fishing license applications and recommend the Belize Fisheries Department, which remains the sole provider of the actual licenses (Fujita et al., 2017). The decision-making process for the MA program is decentralized in this way. While the Belize Fisheries Department has the final say in decisions, the implementation is done at the community-local level through the committees (Alves, 2021). Each managed access area is paired to a previously established MPA, and each area is managed by a set of different NGO partners (Alves, 2021). The Belize Fisheries Department and its respective co-management partners provide training for committee members and managed access license holders (Fujita et al., 2017).
Figure 1. A map of the 8 managed access areas for Belize’s MA program. Source: Belize Fisheries Department.
Figure 2. Map of managed access areas in conjunction with previously established MPAs in Belize. Source: Fujita et al., 2017.

A. Intended Objectives of the MAP

The MA program was created with five key principles/objectives in mind and under the assumption that these would “increase stewardship and ownership in fishers.” (Wade et al., 2019, pg. 1). The five principles include: (1) reducing illegal activities, (2) improving catch reporting, (3) communication, (4) enforcement, and (5)
strengthening the national licensing system (Wade et al., 2019, pg 2). Naturally, however, the key main goal of the MA program is to promote sound economic performance for the fisheries sector through better business practices and increasing the value of seafood products (Fujita et al., 2017). How these objectives are to be measured is less consistent throughout the literature. However, Wade et al. (2019) analyzed documents and conducted interviews with fishers and policy makers, focusing on eight specific themes. Those themes were: enforcement, communication, managed access outlook, illegal activities, licensing system, policy-makers responsibility, catch log books, and committees. Using interviews and literature to identify these themes, they were able to assess the intended objectives for the MA program (Wade et al., 2019).

B. Social Aspects and Supposed Impacts on Well-Being

With the relatively recent policy changes in Belize, one is left to wonder about the well-being of the community. There is often a focus on evaluating income measures to assess societal development with the idea that economic growth equals improvements in human well-being, and this encourages unsustainable as well as unequal policies due to the unbalanced focus on one set of factors over a holistic approach (McGregor et al., 2015). Well-being refers to a holistic definition of the human state in matters “public and private, economic and social and political and spiritual” and includes factors such as individual perceptions, access to resources and economic opportunities, and quality of cohesiveness of the community (Alkire, 2002, pg. 2; Rasheed, 2020, pg. 2). Measuring well-being is a complex endeavor because it is often offered
as one person’s opinion with no universal definition, given that well-being can be dependent on variables such as culture, geographic location, and personal experiences (Alkire, 2002). Despite these variances, it is critical to understand community well-being because it can provide knowledge to help develop management and policy strategies (Colburn et al., 2016). A method of measuring community well-being that uses social vulnerability indices broken into sections such as personal disruptions, poverty, labor force structure, housing characteristics, commercial fishing engagements, and commercial fishing reliance (Colburn et al., 2016). This method stands out from its counterparts due to the range of variables included in the data collection process. However, to my knowledge, these indices have only been used for communities in the United States. This represents a knowledge gap in the understanding of cultural differences amongst measurement tools for community well-being. That being said, these specific indices allow for enhanced analytical social impact assessments and ideally help to inform ecosystem-based fishery management (Colburn et al., 2016).

C. Community Well-Being for Fishers

Fishing communities are unique in some of their specific socioeconomic factors, but several variables can be used to measure well-being across different types of fishing communities. For instance, income per capita and education level are commonly used to measure financial status as part of well-being, but these are not specific to fishing communities (Seara et al., 2017). Fishing as an occupation has been linked to higher job satisfaction due to the feelings of freedom and adventure it produces
(Seara et al., 2017). Therefore, including individual perceptions of happiness and satisfaction for fishers is a way to specifically measure fishing community well-being (Seara et al., 2017). The link between job satisfaction and community well-being is described by Satumanatpan and Pollnac (2017) in the context of small-scale fishers in the Gulf of Thailand. Satumanatpan and Pollnac (2017) stated that dissatisfaction with one’s occupation has a range of negative impacts on human well-being, including psychosomatic illness, other mental illnesses, and issues with interpersonal relationships. Furthermore, their results indicate that well-being through individual perceptions can be split into two parts: satisfaction with the environment and with life in general (Satumanatpan and Pollnac, 2017). For both of those components, environment, and life, it is satisfaction with the fishing income and the self-actualization factor of the job that contributes to well-being (Satumanatpan and Pollnac, 2017).

Monnereau and Pollnac (2012) also investigated the two parts of well-being regarding satisfaction – environment, and life – in Belize. They interviewed thirty-one Belizean fishers and found that they scored high on the social needs category, followed by self-actualization, basic needs, nature, and management (Monnereau and Pollnac, 2012). Self-actualization meaning the notion that fishing is a challenging, adventurous, worthwhile occupation, and social needs meaning satisfaction amongst fishers with their time at sea, being their own boss, and time spent away from their families. Their results indicate that Belizean fishers are satisfied in all of those categories except management, which was the lowest score. However, they found that a high
percentage of Belizean fishers were willing to change occupations, indicating a negative correlation between job satisfaction and Belizean fishers (Monnereau and Pollnac, 2012). The mixed results regarding Belizean fishers' job satisfaction is important to note, given its relevance to community well-being.

There are numerous other ways to conceptualize well-being, Breslow et al. (2016) identifies the ‘4c’ model. In no particular order or rank, the model consists of conditions, capabilities, connections, and cross-cutting (Breslow et al., 2016). Conditions refer to ‘basics’ like safety, health, economy, and the environment, while capabilities refer to variables like governance, livelihood, activities, freedom, voice, knowledge, and technology (Breslow et al., 2016). Connections entail social relationships, culture, identity, and connections to nature. Finally, cross-cutting refers to equity, justice, security, resilience, and sustainability (Breslow et al., 2016). It is a connection to nature that stands out in this particular conceptual framework because of its linkage to job satisfaction and the relevance of job satisfaction to fishing community well-being. Connections to nature is linked directly to job satisfaction amongst fishers because fishing occurs in nature and the Seara et al. (2017) article specifically listed ‘being outdoors’ as a significant aspect of job satisfaction.

D. Supposed Impacts on Conservation

The objectives of the MAP in Belize are to attain economic prosperity in the fisheries sector and increase the value of seafood products, but what are the impacts on conservation, and how do social systems fit into that? Belize has a history of being a
leader in marine conservation, and this remains the case with the implementation of the MA program (Fujita et al., 2018). A goal of the Belize Fisheries Department and of the MA program is to ensure that catch does not exceed the sustainable levels in order to promote longevity in its utilization (Fujita et al., 2018). As a part of the program, persons granted fishing licenses are held to certain conditions regarding their fishing rights, requiring licensed fishers to “follow fishing regulations” that include seasonal closures, size limits, no-take zones (Replenishment Zones), prohibited species, and gear restrictions (Fujita et al., 2018). Additionally, licensed fishers are required to record and submit catch and effort data (Fujita et al., 2018). These regulations were put in place to promote the conservation of the marine ecosystem and support fisher’s livelihoods (Fujita et al., 2018). Thus, the MAP is striving to conserve its marine resources while meeting the needs of the fishers and coastal communities.
CHAPTER 3: MATERIALS AND METHODS

1. Research Framework

This research aims to gain insight into Belize’s fisheries management shift before and after the national policy implementation. The objective of this is to understand community well-being from a socioeconomic perspective to comprehend the impact of this policy on the communities. A multi-strategy research method with a concurrent nested design allowed for quantitative and qualitative data collection and analysis. A concurrent nested design emphasizes one primary method, which is then embedded by a secondary method (Robson, 2011). In this project, the primary method was a combination of interviews and archival documents, while the secondary method was the census information. Quantitative methods were isolated to the processing of census data from the Statistical Institute of Belize (SIB) and other numerical information from the Belize Archives and Records Services building. For the qualitative portion of this study, documents containing narrative information from the Belize Archives and Records Services building were collected, along with semi-structured interviews with key informants. Key informants in this setting ranged from locals, fishers, non-government organization personnel, and scholars with immense knowledge about Belize. Interview participants’ occupations varied as a result of opportunistic sampling.

Every design model for research has its positive and negative attributes, but a multi-strategy approach is often more favorable because it allows for various perspectives of a situation. This was not an arbitrary decision. I carefully chose a framework
with multiple strategies because of the benefits, including its ability to produce a more comprehensive picture of the research topic (Robson, 2011). Other advantages include enhanced validity of findings, neutralizing limitations of individual strategies to build on strengths, addressing various research questions, handling complex situations, and explaining and illustrating the data (Robson, 2011). The downside to this project is its limits to the Belize region and potentially not being able to generalize the findings because the data is too specific. However, the findings from this study may still be knowledgeable and provide useful transferable information for regions utilizing a TURFs management regime.

Community well-being measurements are globally inconsistent, making it difficult to isolate specific factors that would help definitively answer questions posed by this research project. A broadly accepted definition is the combination of social, economic, cultural, environmental, and political factors that are essential for individuals in the community to flourish (Sung, 2018). However, specific factors are not globally agreed upon because community conditions vary across regions (Sung, 2018). Since there is no universally accepted index, it is at the discretion of the researcher to create their own, which is precisely what I did. Before I collected data, I used my prior knowledge and comprehension of previously used indices for assessing community vulnerability from the Colburn et al. (2016) article to create my own index. These factors are population, average income, unemployment, labor force participation, access to health care, average life expectancy, education enrollment, access to education, housing, incarceration rates, and total major crime rate. Each of the previously stated
points contributes to the community environment. How many people live in the community, what the average income is versus what the unemployment rate is, what kind of access they have to health care, what the enrollment is for schools, and how often crime is happening are all significant when trying to understand what is happening in a community. Suppose there are a higher number of people living in one area compared to other areas but the average income is lower. In that case, if the unemployment rate is higher, if there are fewer health clinics, if the high school dropout rate is higher, and if there is a higher criminal activity rate then it is likely indicating that the community is not thriving (Lantz & Pritchard, 2010). Independently, these factors might not indicate much, but it tells a story when they are analyzed together. A difficult part of measuring community well-being is accounting for individual well-being since how well a person thinks they are living is ultimately a subjective perception. A person might describe another person’s life as far from good, while someone else would describe themselves as living well. These factors do not aim to try and speak for every person but instead paint a relative picture of the communities as a whole.

2. **Research Questions**

This project was designed to answer questions specific to the Belize 2016 national implementation of the Managed Access Program policy and its impacts on coastal fishery-dependent communities. The overarching research question guiding this project was:

What are the socioeconomic impacts of fisheries management policies?
This question was further broken into, and the following three sub-research questions guiding this research project are as follows:

- What was the socioeconomic status of coastal communities in Belize before the 2011 pilot launch of the Managed Access Program and the national roll-out of the 2016 Managed Access Program policy?
- How did the national policy impact these communities in regards to socio-economic prosperity?
- How do Belizeans, fishers, non-fishers, and fisheries experts perceive this management shift?

3. Study Site

A. Site Selection

In October of 2018, I was in the fall semester of my senior year as an undergraduate student studying social work and biology when the opportunity to do field research in Belize was presented to me. From March 9th to March 16th of 2019, I traveled with twelve other students to the South Water Caye off the coast of Dangriga in the Stann Creek district of Southern Belize (Figure 3). While my research there focused solely on fish biodiversity amongst different coral reef locations, it solidified my interest in Belize’s fisheries. This experience informed my decision-making process for selecting a thesis topic. Early in the decision process, I knew I wanted to look at the socioeconomic impacts of fisheries management policies and was teetering back and forth between Belize and a U.S. location. Ultimately, my advisor and I decided
Belize presented an appealing case study given that the policy is relatively new and few studies have focused on it.

Figure 3. A map of the six districts in Belize. Corozal, Orange Walk, Belize, Cayo, Stann Creek, and Toledo.
Originally the idea was to do the work remotely, looking only at archival and census documents. However, in late March of 2021, I learned that Belize’s archives are not digitized, thus making it necessary to travel from the U.S. to Belize. Since I would be in the country, I decided to add semi-structured interviews as another data collection method. The idea was I would be able to make contacts with non-governmental and governmental employees and conduct the interviews virtually after I was back in the States. From April to mid-June, I prepared for my trip by researching archive locations and searching online databases for any information relevant to Belize. The Archives and Records Service building was selected because of its various government documents. Locations for interviews were not planned ahead since contact with key informants was primarily through email.

B. Study Sites Description

The Archives and Records Service building is located within the Cayo district in the nation’s capital city of Belmopan (Figure 3). The Cayo district is one of the two landlocked districts in the country and is located mainly in the center and partially in the southern region. Driving southwest from Belize City, you can see the Maya Mountain ranges in the background as you get closer to Belmopan while being surrounded by bright green grass on one side and tumbleweeds moving in dry sand on the other. The archive building (Figure 4) is on a one-way street across from a row of houses and near the heart of the city. Inside the doors is a small reception area with locked drawers for belongings because the research room does not allow bags, food, or drinks to
protect the documents. The research room is on the first floor of the building and is where I spent my time during this portion of the data collection period.

Figure 4. Belize Archives and Records Service. Source: Belize Archives and Records Service.

Several interviews were conducted during my time on Caye Caulker and San Pedro on Ambergris Caye (Figure 5) because these areas were more densely populated. These two cayes are located off the coast of northern Belize in between the Belize and Corozal districts (Figure 3). With their relatively close distance from Belize City and ease of transportation from the main airport, they are ideal tourist locations that support a large population of local Belizeans. Caye Caulker is the smaller of the two, with one main long stretch of road that goes along the entire eastern part of the island (Figure 6). This road is housed by a plethora of businesses and street vendors serving up fresh seafood, making it an excellent candidate for convenience sampling
for interviews. Ambergris Caye is much larger than Caye Caulker, with San Pedro being the main town (Figure 7). Like Caye Caulker, the roads are filled with businesses, street vendors, locals, and tourists (Figure 8). Both of these locations highly advertise fresh seafood to tourists. When I was there, ‘Lobsterfest’ was just beginning, so the streets were filled with the smell of lobsters cooking on the grills.

Figure 5. A map displaying the northern cayes of Belize. Source: cayecaulker.org
Figure 6. A photograph of the main road on Caye Caulker. Source: onegirlwhole-world.com
Figure 7. Map of Ambergris Caye, Belize. Source: sanpedroscoop.com
Belize City acted as the home base for the four weeks I was in the country, which is not deemed a tourist hotspot. In fact, every trip guide I read or watched specifically named Belize City as the one place to avoid due to its high level of crime. Since the main goal of the trip was to collect archival records, one might have thought it would have been easier to stay in Belmopan, but Belize City offered ease in traveling to the cayes. On a ferry boat trip back to the mainland from the cayes, I noticed groups of individuals fishing in the water (Figure 9). I located the area on a map and made it a point to drive there several times to observe. Figure 10 shows a map of Belize City with a squared-off section in the corner labeled ‘Downtown Belize City’, and
this is where the fishers were located. An interview was conducted there during one of my observation trips.

Figure 9. This photograph was taken from a water taxi of fishers in Belize City. Source: Mary Carper
Figure 10. A map of Belize City. Note of importance is the squared section ‘Downtown Belize City’. Source: OrangeSmile.com

4. Data Collection

The beginning of the data collection process entailed browsing the Statistical Institute of Belize (SIB) website for demographic information. The website provided data for the gross domestic product (GDP) for certain industries, population by district and gender, unemployment rates by district and gender, labor force participation rates, and education enrollment by district and gender. GDP was not an original factor I had wanted to address. However, after I saw the GDP for the fishing industry on the SIB website, I realized it was an essential component of well-being specific to fishers and
fishing-dependent communities. Population, unemployment, labor force participation, and education all act as indicators of community well-being. Unemployment and labor force describe the job market through its numbers but need to be examined regarding population. This is because an area might appear to have an incredibly high unemployment percentage, but the population might be notably higher than surrounding areas equating to that higher unemployment percentage. For education, I wanted to look at high school enrollment in each community because the labor force age in Belize is 15. It can be common in households for teenagers to drop out of high school to enter the workforce to help support their families. Therefore, high school enrollment acts as an indicator because if enrollment is significantly higher, it could mean households are doing financially well enough that teenagers can remain in school.

There were two important data points that could not be accessed via the SIB website, therefore, I had to look elsewhere. These two data points were incarceration rate and major crime rates, which were found through two separate sources. Incarceration rates were located through the World Prison Brief website, and major crime rates were found through the Belize Crime Observatory website. Incarceration and major crime rates provide statistical information regarding safety in communities. Crime and incarceration are historically linked to economic decline. When individuals are struggling financially they may turn to crime out of necessity. One of the first questions people have when they move to a new area is if the community is safe, because people value their safety. Thus, crime is typically a critical component of addressing community wellbeing and therefore a data point that I was highly interested in gathering.
The second part of the data collection process occurred in the Belize Archives and Records Service building, to which I brought on a research assistant to help me sort and take notes on documents (Figure 4). I decided to do an initial introductory visit to the building because I could not make contact with them before I arrived in the country. This allowed me to introduce myself, my project, and my research assistant and get to know some of the staff since I would be spending multiple long days there. During this initial visit, I talked with two archivists on staff about the project and what I was aiming to find. This helped the process afterward because they could better help me find documents. The first time after the introductory visit, my research assistant and I searched through their online databases, which are only available on their computers in the building. We started with the ANR (annual reports) collection and decided the cutoff dates would be 2000-2021, giving a ten-year frame before and after the MA program was piloted. We searched through individual collection databases, which were listed as abbreviated capital letters. ANR stands for annual reports, ASR means assessments, studies, and reports, ERC is educational reports, SPC are transcripts of speeches, and MC stands for miscellaneous. This still left us with hundreds of folders to look through, but there were various folders in the collection that we knew we could set aside based on the ministry it came from. Annual reports from relevant ministries or organizations involved keywords such as environment, agriculture, fishers, port authority, tourism, protected areas, conservation, and culture. Some of the keywords are obvious as to why I chose them, but others may not. I chose to search for tourism in all collections because tourism and fisheries often go hand in
hand for Belize. Similarly, documents with the keyword culture were screened due to the relevancy of fishing in Belizean culture. We read 15 documents to completion for the ANR collection to take notes and have appropriate pages copied. Each set of document notes and copied pages were filed on my computer through Zotero. This process was repeated for each collection but with minor changes in keywords for search purposes. For the ASR (assessments, studies, and reports) collection, we read nine documents and utilized new keywords, including political, poverty, economic, barrier reef system, and marine pollution. The ERC (educational reports) collection has every academic paper submitted to the government either directly to the archives or another sector. We were able to gather nine total documents for this collection, and I was able to get more specific with keywords due to the high volume of academic researchers interested in Belize’s marine resources. Keywords and phrases included conservation, human impacts, economic assessment, Queen Conch, rural fishers, commercial fishers, community perspectives, sports fishing, IUU fishing, and coastal sustainability. There were a total of 3 transcribed speeches in the SPC collection with keywords and phrases like Caribbean fisheries mechanism, sustainable development, and United Nations (UN). I chose the keyword United Nations because a critical aspect of the UN is the political interest in international fisheries. Lastly, we acquired five relevant documents from the MC (miscellaneous) collection, four of which were short magazine articles, and the other was a manifesto-type booklet. The four magazine articles were centered directly around fishing, while the booklet’s keywords were women, development, and community.
Interviews were conducted during my time in Belize due to the small number of documents I could procure from the archives. These interviews occurred in Belize City, Belmopan, Caye Caulker, and San Pedro on Ambergris Caye. Key informants and any identifiable information remain confidential, but the overall process does not. Originally interviews were solely supposed to be with experts in the field, working professionals in government offices and non-government organizations. However, due to the smaller than anticipated number of archival documents, the decision was made to broaden the interview participants by including local Belizeans, fishers, and scholars. During my remaining seven days in Belize, I sought out individuals in locations close to the shore, in highly populated areas, and in convenient settings. From these areas, I interviewed a total of eight people in Belize. Each of these interviews was audio recorded and lasted between five and thirty minutes. Observation was a key first step because the individual was frequently busy engaging in other tasks. Therefore, the timing was critical and led to several relatively short interviews. Interviews were semi-structured and approached with key themes in mind, but ultimately the conversations and questions I asked depended on the person's initial responses.

A total of two interviews were done via zoom in Rhode Island in the fall. For these two individuals, purposive sampling was done by recruitment emails. Recruitment emails were sent to about fifteen individuals with only two responses on multiple occasions. Zoom interviews were scheduled at a time convenient for myself and each key informant, allowing me to ask every question I had drafted earlier during the summer. These interviews lasted between 35 and 55 minutes. The goal was to gain a
deeper understanding of expert knowledge geared explicitly toward the MAP policy implementation, given each participant's level of experience in the field. Unlike its predecessors, this set of interviews was structured in a more formal setting sticking solely to the list of prepared questions. This was done to ensure the prepared questions were answered and to keep to the maximum time limit of one hour.

5. Data Analysis

Quantitative data in the form of census statistics were analyzed using Microsoft Excel for summary statistics such as range, mean, and standard deviation. After gathering the statistics, they were put on several excel sheets sorted by factor (i.e., GDP, unemployment, etc.), and then each factor was sorted by year on a table. Tables were then made into graphs in order to show overall trends. Excel functions were executed to find each factor's mean and standard deviation with ranges listed at the bottom of these trends in conjunction with both mean and standard deviation.

Since qualitative data was split between documents and interviews, they were slightly different in the analysis process but followed a similar overall path. Archival documents were organized on Zotero during the data collection process. Each document either had notes taken directly on Zotero, scanned copies attached as picture files, or both. Notes were copied and pasted onto a word document to upload a file onto Dedoose™, a coding software, while scanned copies were uploaded as they were for further analysis. Interviews required an extra step after the data collection phase, as
each interview had to be transcribed onto a word document. This was done manually by listening to each recording and typing out directly what I was hearing. Once everything was uploaded onto Dedoose™ where they were further organized using code analysis. Codes were created as I worked through the documents and interviews to identify key points and themes. Those key points and themes were then added as root and child codes. Root codes are larger themes, with child codes coming directly from the root codes. For example, a root code was “Fishing Licenses” for the interview data. In contrast, a child code was “Commercial Fishing License,” and the grandchild code was “Commercial Fishing License- Issues and Concerns” (Figure 12). Two flowcharts help break down these relationships between root codes, child codes, grandchild codes, and great-grandchild codes in Figures 11 and 12 below. This categorization allowed me to process the results and identify key themes and trends.
Figure 11. A flowchart showing the selection of codes used for archive documentation data. Root codes are yellow, child codes are light blue, grandchild codes are purple, and great-grandchild codes are pink.
Figure 12. A flowchart showing the selection of codes used for interview data. Root codes are green, child codes are orange, grandchild codes are light blue, and great-grandchild codes are light green.
6. **Difficulties in the Field**

The flexible design of this project came about out of necessity because the methodology framework changed during the data collection period. Initially, the primary purpose of going to Belize was to go through the archives under the notion that it would take an extensive amount of time due to the high volume of relevant documents. This was exacerbated by not being able to make contact with the archive building beforehand because I did not know what existed there or what I would be able to find. After a little over one week, my research assistant and I had gone through every folder, forcing us back to our temporary home in Belize City to begin organizing what we had found. After several discussions with various professors, the decision was made to increase the number of interviews due to the unexpected small abundance of the archival records. As a result, I had to make an amendment to my IRB application which took an additional couple of days. This left only about seven days to scout out locations to find individuals to interview. In the midst of it, I was battling with being in a pandemic in a foreign country that was transitioning from months of national lockdowns. Another purpose of going to Belize was to make contacts for potential interview participants, but the COVID-19 pandemic restricted my ability to enter certain buildings. Due to the pandemic, the Belize Fisheries Department was still not open to the general public, which meant I could not visit to try and make contacts there.
CHAPTER 4: RESULTS

1. Demographics and Results from the Statistical Institute of Belize Data

The main research question of this project aims to understand socioeconomic trends before and after the Managed Access Program (MAP) was implemented to determine community well-being. Socioeconomic information, as discussed in previous chapters, can be categorized in statistical reports as population, gross domestic product (GDP), labor force participation, unemployment, total major crime, and high school enrollment.

A. Gross Domestic Product for the Fishing Industry

Gross domestic product (GDP) represents the total dollar value of all goods and services produced by an economy (Kramer, 2022). Thus, making GDP a critical indicator for tracking the health of a country’s economy (Kramer, 2022). In this study, GDP was isolated to the fishing industry and is visually represented by one graph (Figure 13). Before the pilot MAP was launched in 2011, the fishing industry GDP ranged from $53.5 million BZE to $147.2 million BZE (Figure 13). A notable year was 2007, when GDP plummeted to $53.5 million. This drop in GDP aligns with the global financial crisis that originated in the United States (Helleiner, 2011). This is relevant to Belize for two reasons. First, it was a global financial crisis, and Belize is part of the international community. Second, the crisis originated in the US, where Belize
is a major exporter of lobster, conch, and farmed shrimp (Belize Fisheries Department & Wade, 2005). Since 2016, when the MAP was nationally implemented, the fishing industry’s GDP has remained stable in the twenty million range (Figure 13).
Figure 13. A graphical representation of the Gross Domestic Product for the fishing industry for the years 2000 to 2020.
B. Belize National Population

The population of Belize at the beginning of the new millennium was estimated by the Statistical Institute of the country’s census report to be 232,111 (Figure 14). The years 2001 and 2002 are missing from the documentation, making the next available year 2003, in which the population increased to 273,700 (Figure 14). The population increased steadily despite another gap in documentation leading to missing data for 2008 and 2009 (Figure 14). Starting again in 2010, the population increased steadily to 2020 when the estimated population total was 419,199 (Figure 14).

Figure 14. A graphical representation of the total country population in Belize for the years 2000, 2003-2007, 2010-2020.
C. Unemployment and Labor Force Participation

National unemployment and labor force participation numbers are relevant to this research because they indicate individual economic prosperity represented by the number of individuals either in the workforce or not in the workforce. It is essential to acknowledge these statistics to have a holistic understanding of socioeconomic status due to its relevance to economic prosperity. Unemployment rates have gone through several up and down points throughout the last two decades, ranging from 6.7% to 14.4% (Figure 15). There was a sharp increase in 2007 to 12.4%, but this increase was followed by a decrease in 2008 to 8.2%. The increase in unemployment in 2007 aligns with the global financial crisis previously discussed relating to GDP. In 2012, the unemployment rate jumped up to the highest percentage in the last two decades to 14.4% (Figure 15). There was a steady decline from 2017 to 2019, before increasing in 2020 and subsequently decreasing in 2021.

Regarding labor force participation, it fluctuated before 2011 from 49.9% to 59.2% (Figure 16). Interesting to note here is it remained stable in 2007 during the global financial crisis, unlike unemployment. After 2011 labor force participation continued to fluctuate between 55.10% and 66.4% (Figure 16). Between 2016 and 2019, the participation rate remained relatively stable before crashing in 2020 due to the global pandemic. Overall, these unemployment and labor force participation numbers range dramatically over the years, highlighting important trends elaborated on in the next chapter.
Figure 15. A graphical representation of the national unemployment rate in percentages for the total population for Belize for the years 2002-2008, and 2012-2021.
Figure 16. A graphical representation for the percentage of national labor force participation in Belize for 2000-2008 and 2012-2021
D. Total Major Crime and Incarceration Rate

Overall, total major crimes in Belize have exhibited a downward trend from 2009 to 2021 (Figure 17). Starting in 2009 with 3,333, decreasing the next two years before increasing slightly from 2,766 in 2011 to 2,772 in 2012 (Figure 17). The numbers continue to fluctuate between year and year but generally trend downwards (Figure 17). In 2016 the total number of major crimes was recorded at 2,137 and decreased in 2017 to 1,337 (Figure 17). In 2020 the total number was recorded at 888 before reaching its lowest level in 2021 at 883 (Figure 17). The number of incarcerated individuals has fluctuated over the years. From 2000 to 2006, there was an exponential increase from 765 in 2000 to 1,363 in 2006 (Figure 18). From 2008 to 2010, there was a slight increase from 1,365 in 2008 to 1,420 in 2010, followed by a sharp increase to 1,562 in 2012 (Figure 18). 2014 begins the downwards trend decreasing from 1,562 in 2012 to 1,527 in 2014, 1,297 in 2017 and 1,150 in 2019 (Figure 18).
Figure 17. A graphical representation of the number of total major crimes in Belize from 2009 to 2021.

E. Secondary School Enrollment

Education is an important indicator because higher levels of education are traditionally associated with a higher socioeconomic status (Darin-Mattsson et al., 2017). The total number of students enrolled in secondary school in Belize has had an overall upward trend over the past two decades (Figure 19). Starting in the new millennia (2000) with a country-wide total enrollment of 13,143 students increased exponentially over the next five years to a total of 16,696 in 2005 (Figure 19). From 2008 to 2015, there was an exponential increase in enrollment. Enrollment decreased slightly from 2015 to 2016 and again in 2017, hitting 22,027 (Figure 19). In 2018 this number increased to 22,313, before decreasing to 22,280 in 2019 and increasing again to 22,760 enrolled secondary school students in the year 2020 (Figure 19).
Figure 19. A graphical representation of the number of students enrolled in secondary level education nationwide from 2000 to 2020
2. Community Well Being

A. Fishing Industry Economics and Changes in the Sector

An open-access regime and the lack of regulations for fisheries management was presented as a pressing issue in the fishing industry in Belize. An economic strategy report in 2002 stated:

"Some of the constraints facing capture fishery are harvesting levels exceeding maximum sustainable yields, lack of consistent data collection and stock assessment, an open fishery policy that is available to all Belizeans and permanent residents, and the absence of any deep-sea fishing operations." (ASR 1222).

This document excerpt refers to the open-access regime and the lack of regulations for fisheries management during that time frame. Within the next couple of years, this message spread to Belize media as one magazine article, in particular, wrote a warning to its audience in 2006 about the potential for the Belize fishing industry to collapse due to the lack of regulations (MC 103 Box 6 Issue 15). During this same period (2000-2010), shrimp farming increased rapidly, with the number of farms more than doubling over one year (2002-2003). An archival document, an annual report recorded by the Ministry of Agriculture and Fisheries (ANR 578,) stated that by the end of 2003, “shrimp represented 84% of all fisheries export earnings”.

However, according to multiple archive reports, this part of the fishing industry did not last as the market value for shrimp tails decreased, and the shrimp farms in Belize began to close. While the number of shrimp farms was decreasing, the number of fishers entering the industry increased. There is no explicit connection from the data linking the decline in shrimp farms to the increase in fishers, but they were happening during the same time.
While conducting archival research, I found that some documents regarding the post-MAP economic status of the fishing industry were limited due to internal government issues that will be further discussed in a later section. I, therefore, decided that interviews with key informants became a critical aspect of gaining that understanding. One question I asked those fishermen participants is “Have you noticed any changes in your fishing efforts?” to gain insight specific to shifts in day-to-day operations for fishers. Responses to this question varied, with one participant stating

“Not really. It’s mostly the same. Because every day you get new fishermen, people are always starting up.”

This individual was not alone in their comprehension of events, as multiple other participants did not note any significant changes in their fishing experiences. However, most fishers contradicted this notion as they spoke of changes in the government, fish stocks, and restrictions. The ban on trawlers and gill nets was mentioned in conjunction with the increased effort they now have to make due to not being able to use either of those forms of equipment. A fisherman stated,

“Now, after the first four to five months, it’s hard to catch lobster, and right now, it’s kinda hard to get snappers too. Everything is being taken.”

This fisherman noted the difficulty in catching certain species during the catch seasons, which differ depending on the species. He went on to discuss the prior ability to catch lobster, in particular, all year around before seasonal restrictions were put in place.

Both opinions regarding the fishing industry change certainly exist amongst Belizean fishers. However, the more common narratives amongst interview participants are the various changes implemented in the fishing industry over time and the
challenges it has brought to their job. There was an overarching theme of frustration but acceptance and understanding of why restrictions have been put in place in the industry. Most fishers expressed comprehension of the importance of preserving fish stocks for generational fishing purposes while acknowledging the current obstacles it creates. There was definitely an impression left from the fishers that most of them feel highly regulated, which left a negative connotation. However, again nearly every single one of them I interviewed made sure to note their understanding of the importance of preserving fish stocks.

B. Environment and Natural Disasters

A common theme found in the archival data was the role natural disasters have on the management of fisheries and the policies created to address concerns in the fisheries sector. It is crucial when aiming to understand how a community is doing in terms of their socioeconomic status to comprehend the environment in which they are located (Walker, 2016). Points from separate archive documents drive home the understanding that investing in the advancement of the marine environment creates increased opportunities to help poor households, communities, and individuals. An educational assessment focused on conservation and Belize communities explains the connection in plain language, stating:

"Not only are poor people the recipients of the worst environmental conditions, but they are also the main losers where conservation efforts and protected areas are concerned." (ERC 111).

This assessment is referring to the country of Belize as a whole unit because relative to other countries, Belize is seen as a developing nation. However, this notion stands
whether the context is centered around a country or a small village; the environment and economic status are connected. A transcript of a speech from the archives (SPC 015) presented by Stuart Leslie, Belize’s permanent representative to the UN from 2000 to 2005, supported the same notion. In the transcript of his speech given at the thirteenth session of the Commission on Sustainable Development, he stated it would be impossible to address the needs of the poor without also improving legal policies and frameworks regarding water resource management. This is relevant to this study because water resource management includes fisheries.

Another recurring theme regarding the environment in the archival documents is the role natural disasters play in policy and management. Hurricanes were the main type of natural disaster that was discussed throughout the various government reports. For example, a 2002 report cited four hurricanes that had directly impacted Belize in a three year period stating that:

“[Hurricanes] caused heavy damage to tourist facilities, utilities, roads, bridges, school buildings, houses, and household goods and necessitated an enormous call on foreign currency for reconstruction and recovery efforts. At the same time, the hurricanes had a significant negative impact on agricultural and fisheries exports earnings” (ASR 1222).

Damages from hurricanes were noted in nearly every annual report from the Ministry of Agriculture and Fisheries and the Ministry of Tourism and Culture, indicating that it severely impacts socioeconomic prosperity for communities. Due to the geographic location of Belize and its position in the Caribbean Sea, it is prone to hurricanes which can differ in their intensity and cause an array of damages. Those damages cost money to fix and leave communities struggling to meet basic needs. The destruction of boats, equipment, and the surrounding environment leads to negative impacts in the fishing
industry, which only exacerbates the issue of not being able to meet basic needs. As a result of the damages from hurricanes, there are often short-term shortages of domestic commodities, which again only increases the likelihood of households not being able to meet basic needs due to the shortages (ASR 1222).

C. Economics of Tourism and Linkages to Fisheries Sector

Another important aspect of economics in Belize is the tourism sector because tourism in Belize is often centered around marine activities like sports fishing. Thus, making it critical to highlight relevant findings from archive documentation to understand its role within communities. According to multiple archive reports that I assessed, the tourism industry as a whole in Belize grew exponentially between 2000 and 2007 (ASR 1156; ASR 1127; ERC 614). The topic of “fisheries tourism” came up in nearly every archival document examined for this study. It was continually noted that the areas with the most tourism activity and development were coastal zones, given Belize’s marine life. Belize is known for the crystal blue water of the Caribbean, which is filled with diverse marine organisms, making the coast a popular location for tourism. One government report stated that in 2005 “80% of hotels, condominiums, etc., were located on the coast” (ASR 1156). Other archival documents I read noted that in 2008, 60% of visitors to Belize participated in various marine experiences, which included but were not limited to; snorkeling, scuba diving, and sports fishing (ASR 1127; ERC 227). Sports fishing is a relatively newer form of tourism for Belize, having only gained popularity in the last two decades (ERC 227). A 2006 educational
assessment reported tensions between sports fishing and commercial fishing communities since commercial fishing often depleted stocks that sport fishers were interested in (ERC 227).

After introducing the Managed Access Program through two pilot sites in 2011, the tourism sector continued to grow in its economy, with tourism accounting for 28% of formal employment in 2011 (ERC 735). By 2012 the government had drafted the first ‘National Sustainable Tourism Master Plan” with guidelines on development up to 2030 (ANR 2129). The government report states that one of the main goals of the National Sustainable Tourism Master Plan is to double the number of visitors and tourists more than while enhancing the length of stay (ANR 2129).

D. Poverty, Housing, Education, and Health Care

Poverty describes a state of being extremely poor in terms of wealth and can result in negative well-being (American Psychological Association, 2009). Poverty can be characterized through other factors like health, education, and living standards, providing a holistic understanding of socioeconomic status (UNDP, 2013). This research needs to have that holistic understanding to address the research questions. Before the pilot launch of the Managed Access Program, there was an assessment report conducted in 2002 by the National Human Development Advisory Committee on behalf of the Ministry of Economic Development of Belize. This report was focused on poverty assessment for the country and evaluated multiple factors that contribute to or exacerbate the impacts of poverty, including housing, education, and health care (ASR 3). This report concluded that 33.5% of the total population were poor and 10.8% were
very poor, with poverty rates being highest in the Toledo district in southern Belize and lowest in the Belize district in the northern part of the country (ASR 3). The same assessment reported school enrollment to be much higher in urban areas as opposed to enrollment in rural areas (ASR 3). In terms of financing education, this document states:

“Children have universal access to primary education regardless of their poverty status. However, as they matriculate for secondary school, the access to this level of education is influenced by their poverty status. The level of access seemed to increase with improvements in one’s poverty status. The poorest had the least access to secondary school. Their net secondary school enrollment was 34.6% compared to 75.2% for those in the wealthiest quintile” (ASR 3).

Additionally, the assessment discusses how only 5.6% of people in the poorest bracket had attained secondary or higher-level education compared to the 39.7% in the wealthiest bracket (ASR 3). The report notes a similar trend regarding the differences in housing between urban and rural communities. Only 35% of the poorest households in rural areas have electricity and, overall, are at a greater risk for inadequate housing than those in urban areas (ASR 3). The assessment also notes a decreasing trend in ownership despite an increased number of newly built units (ASR 3). Lastly, this archival document provided insight into health care, stating that the primary source for medical care was public health facilities versus private facilities. The average cost for a visit was $8 for a public facility and $67 for a private facility (ASR 3). Although there is an Environment Statistics report from the archives written in 2012 by the Ministry of Natural Resources and Agriculture, the poverty assessment portion of that report is dated 2009. Therefore, there are no current poverty assessments as archive documents dated after 2011.
E. Safety, Crime, & Incarceration

An essential aspect of understanding community well-being is determining safety. One of the ways I did this was by interviewing locals to ask them about their thoughts on the subject. These locals were asked about the community regarding safety and crime rates due to the length of time they have lived in that particular coastal area which is a popular area for fishing. There was a quick acknowledgment of criminal activity in the areas followed by explanations of the activity. A local explained that contrary to popular belief, he knows

“One guy who was in charge of 90% of the shootings. They locked him up, and now I hear no guns.”

This participant made his opinion clear that he believes crime in the community is isolated to individuals rather than groups. Once that individual is arrested, the crime rate goes down significantly. However, a 2000 archive report claimed the offenses that warranted the highest number of arrests and incarceration were theft, dangerous drugs, and illegal entry (SERIES Collection IDEAS 2000). This same report stated that the more significant concern in public opinion is police responses to police reports and criminal activity because the general public does not believe the police can adequately undertake investigations and prosecutions due to lack of training, sophistication, prosecuting techniques, lack of vision and direction in leadership, lack of professionalism, and overall lack of experience (SERIES Collection IDEAS 2000).

Regarding illegal maritime activities, the Belize government passed a bill in 2005 that created the Belize National Coast Guard (BNCG) and gave them the right to arrest any person breaching maritime laws and regulations, along with matters relating
to environmental resource protection at sea (MC 103 Box 6 Issue 15). According to an archival document, illegal fishing and theft are the two biggest concerns as Belize’s waters are bursting with modern-day pirates (MC 103 Box 6 Issue 15). Illegal fishing will be further discussed later in this chapter as a major area of concern regarding the MAP.

Another critical aspect of understanding incarceration and crimes regarding marine-related activities is the notion that when fishers diversify in the job market, some of them participate in the illegal drug market. This comes from one archival document in particular that specifically studied this aspect of the fishing industry in Belize. It states,

“Unfortunately, the most notorious source of extra cash among Belizean fishermen is collected from bundles of marijuana, cocaine, or drug money found floating along the coast. Speed Boats transporting drugs from South America to the US lose bails of their cargo frequently enough that some people use this source as their primary income. Almost all of the Hopkins are fishermen, but they don’t look for fish anymore. Now they look for $20,000 of cocaine money.” (ERC 241).

With drug-related crimes being one of the three major crimes committed in Belize, this is important to understand because when fishers diversify, this is a potential option for them. This alludes to a connection between economic productivity in the fishing industry and major crimes as well as incarceration rates.

3. Management

A. The Role of Government and Non-Government Organizations in Fisheries Management
A key aspect of this study is to understand community well-being regarding the newly implemented fisheries management policy. In the previous section, I discussed results pertaining to community well-being. In this section, I will lay out results from the topic of management specific to the changes it has gone through in Belize, the impacts it has on community well-being, and the challenges it currently faces. Part of understanding fisheries management is comprehending the roles of the government and non-governmental organizations. I did this by asking broad interview questions focused on both government and non-governmental organizations and identifying themes in archival documents. The majority of the archive documents are government reports which provide details of internal roles and goals regarding fisheries management, environmental management, tourism strategies, and administrative tasks. These types of documents often listed various methods and actions that different government bodies were taking to meet their goals. For example, in 2008, the Ministry of Natural Resources and the Environment, through the Department of the Environment, wrote a National Plan for Action regarding land-based pollution and lists the ways in which the Belize government will reach its goal of reducing harm to marine environments from land-based pollution. The overarching themes for these types of government documents were coordination and organization. Meaning each government report was clear in its objectives to meet their respective goals regarding fisheries management, environmental management, tourism strategies, and administrative tasks.

While the overall themes from the archival documents portrayed a consistent coordinated and highly organized government, this was not the overall perception I received from interview participants. I asked key informants to explain their experiences
with the government and NGOs in Belize to gain insight into the public perception of both types of organizations regarding the MAP. There was an overwhelmingly negative impression of the government’s lack of abilities, where participants often noted the rapidly changing government structure as a major weakness. The disconnect between the government and its citizens was another central theme in the interviews. A participant stated:

“People don’t understand the legislation, and they don’t have the capacity to do it. Before the pandemic, we were building our capacity, and then the pandemic hit, and we went from 8 people to 2. The capacity meaning the resources. We don’t have the people or the space to do what we should be doing. There is a disconnect between the parliament and the general assembly, they’re supposed to make it public knowledge, but no one knows because they don’t talk about it.”

This participant made it clear that the disconnection between the government and its citizens directly impacts the ability to do their job. Other interview participants talk about this issue, and multiple individuals note that the rapidly changing government structure exacerbates the issue. Another participant explained:

“Apart from the Statistical Institute, all ministries are on their own, and the Statistical Institute is only statistics. It’s very individual, but again only some of them understand sending in reports and the importance of the data. But then things change, and ministries change, and offices that were sending in reports no longer send anything. When it comes to fisheries, fisheries are a hot mess.”

The issue being discussed by this participant is the lack of annual reports being submitted or conducted by government offices, and it being exacerbated by organizational changes within the government. The lack of consistency in the government was a common theme in the interviews I conducted. The impression I received from these
participants when discussing the government was frustration and annoyance as multiple individuals expressed the lack of belief they have in the ability of the government to become consistent.

Discussions regarding non-governmental organizations were overall more positive than their government counterparts, but it was not presented without issues and concerns. Participants noted that NGOs are stepping into co-management positions to help the government processes and projects. One participant stated:

“In 2014, before they rolled out Managed Access nationwide, there was a big informational campaign by Rare and EDF and the Fisheries Department to really inform fishermen and communities.”

Rare and EDF (Environmental Defense Fund) are two non-governmental organizations that have aided the Belize government in its fisheries management responsibilities, as discussed by this interview participant. NGOs having more resources and the ability to help implement government policies was a common theme in the interviews. However, one participant noted that while some NGOs have stayed committed to Belize, other international NGOs have not. They stated:

“Here you have Belize and these international organizations coming in and putting money in and providing people with jobs at NGOs and at governmental agencies, implementing this new fisheries management plan, and they have essentially pulled out from Belize. As of now, I think maybe one or two people are still funded by either EDF or Rare working on Belize Managed Access, and they’re marketing it as a success story, and now that’s why they’re putting it in the Philippines and Indonesia.”

This participant made it clear that this common action amongst international NGOs is colonialist in its nature and contributes to negative impacts on the community. Colonialism refers to the act of controlling or dispossessing a group of people. In this circumstance, foreign NGOs came to Belize with resources and funding to implement a
TURFs-style program. Once the MAP was implemented, the NGOs left with their resources and funding, leaving Belize without the capacity to manage the new fisheries program they helped create properly. It should be noted that local Belize NGOs were not the target of this particular comment. The participant went on to discuss several local NGOs that play a significant role in the co-management of the new fisheries management regime. TIDE (Toledo Institute for Development and Environment), SEA (Southern Environmental Association), and TASA (Turneffe Atoll Sustainability Association) were ones listed by name in the discussion as the organizations doing monitoring for the management program.

There are several educational assessments in the Belize archives that discuss NGOs regarding co-management. These assessments differ in tone and theme from the conversations during interviews because while key informants often spoke highly of local NGOs, some of the educational assessments did not. For example, a document from 2006 stated:

"In the case of TIDE, there is a lack of genuine community participation and empowerment. People did not experience the possibility to take part in decision-making, and only a few trained guides were in fact able to benefit economically from TIDE's courses." (ERC 195).

This excerpt discusses reactions from locals interviewed by the author of that assessment about a tour guide certification training program that TIDE offers. From this researcher’s conversations with locals, it became clear that this NGO is not always positively publicly perceived. However, this document only speaks to this particular aspect of TIDE and does not explore public perception of other programs. It should also be noted that the negative perception of TIDE in this assessment does not come from the course itself but rather from the lack of support afterward. Another important aspect to
consider regarding this document is the date. This report was written in 2006, putting it four years before the establishment of the co-managed Managed Access pilot sites and 16 years ago from today. Meaning public perception regarding TIDE and other local NGOs could be vastly different from what it was 16 years ago.

B. Transition from Open Access to the Managed Access Program

Before implementing the Managed Access Program, Belize was operating under what has been called “open access management.” It is important to comprehend how this transition from one regime to another happened to understand socioeconomic shifts in the communities. Interview questions focused on identifying motivations for this management shift and the goals for the MAP. There was consensus among interview participants that the key motivation for changing management regimes was the decline in fish stocks under open access management and the hope that a new framework would improve catch per unit effort and increase revenue. A participant explained what open access was like in Belize:

“Open access was really a free for all. There was no limit to the number of commercial fishing permits and no limit to where at sea folks could go. Except they couldn’t go in the Conservation Areas or the No-Take Marine Reserves.”

. . . “there wasn’t really a limit to the types of gear used. Like gill nets were still allowed, and those were just banned in 2018 maybe, and they’re still being phased out because some people were not so happy about that.”

Another participant added that under that resource regime:

“All Belizean, 18 years and older, was able to apply for a fishing license and be granted a fishing license.”
Interviews with the participants indicate that the transition in management regimes came from wanting to promote Belize’s fisheries' longevity by increasing restrictions put in place and altering the licensing process. These themes were heavily supported by the archival literature in terms of what motivated Belize to end its open access regime and transition to the Managed Access Program. A common phrase in the pre-MAP archival documents was that “fishermen [were] not restricted,” and it prompted a plethora of formal recommendations to the government to create a policy that would place restrictions on fishers. One archival report, in particular, noted that the Managed Access Program is part of a global ‘Fish Forever’ initiative spearheaded by Rare in response to fishermen’s concerns about sustainable fishing practices (ERC 735). Conversations with key informants support the idea that the MAP was initially prompted by fishers during various interviews.

The licensing process was further discussed in several interviews with the consensual understanding that the new MA policy created committees made up of members who were voted in and oversee commercial fishing license applications. One key informant stated:

“It came with a licensing process that involved a managed access committee, and that committee includes two people from the community who knew the fishers. So as soon as they saw a name on the fishing application, they could say, ‘guess what, this person does not or has not traditionally used this area, so they do not qualify for a license.’”

This participant discussed how the committees can reject commercial license applications, and this decision can and has become politicized and personal. They went on to explain this:

“They get very upset though when they see licenses offered to other fishers [whom] they do not consider customary fishes, yet if that license application is
a friend or a family member of a fisher, they want that person to get the license. So they’ve been extremely personal, they’re like, ‘if it’s my brother and my sister and my sister in law or my brother in law who wants a license, then they should get it if it’s someone I don’t know and have no affiliation with then they don’t belong.’”

The individuals voted into the committees are community members and can make decisions regarding a person’s livelihood, but this process has seemingly become personal instead of professional. This is potentially creating negative impacts on the community and is, therefore, a critical part of the MAP to understand. By limiting licenses to select individuals due to familial or friendly relationships instead of the professional standards sets an unfair and unjust precedent for the entire process. Multiple interview participants noted the professional standards committees are supposed to use as a criterion for granting licenses. Commercial fishing licenses are supposed to be granted to those who have historically used the designated areas for fishing. One key informant expanded on this aspect as they stated,

“We call it Community Managed Access Areas. It means that commercial fishers who traditionally, historically, customarily use an area have access to fishing in that area. The whole idea is that if this is an area that you’ve been benefiting from for a long period of time and you know that you alone have access to this area, then there is better stewardship.”

With that understanding of the new licensing process, interviews moved towards gaining a more profound comprehension of other aspects of the MAP. The new management regime was created to divide Belize’s waters into zones where fishers are granted access through commercial fishing licenses to two of the nine areas. Participants elaborated on other management aspects, including reporting catch data and marking boats through different colors. One participant stated,

“As part of that [MA] program, they color-code their boats, so each boat has stripes for which colored area they’re allowed to fish in.”
However, this participant explained that the challenge is that not everyone is color-coding their boats. This lack of compliance is not isolated to the color-coding of boats as several participants noted a vital aspect of the Managed Access Program is the requirement to record catch data. However, many fishers are not complying with this mandate. One of the key informants explained the catch requirement to me,

“Another component of Managed Access in Belize is the logbook process where people are recording their catch, or they’re supposed to in these paper logbooks, and those go to either fisheries officers at the NGOs, the co-managers of the marine reserve, or people at the fisheries department.”

From the interviews I conducted with the key informants as participants, there was a common understanding that recording catch is a critical aspect of the new program that fishers are not complied with. Non-compliance will be further discussed in the next section since it is a major issue in the new management regime. Overall, all of these components, recording catch, color coding boats, limiting commercial fishing licenses, and establishing the committees, represent the ideal management structure in which Belize has mandated in striving to meet the goals set out by the government and its NGO counterparts.

C. Issues and Concerns

During the interviews, the conversations would often steer towards various problems that the participants brought up before I would ask them to identify specific issues. The most common concern across the board was illegal, unreported, and unregulated (IUU) fishing. It was explicitly brought up by several key informants and often alluded to by others. An example of an explicit mention of this issue is as follows,
“Honduras and Guatemala are not too far away from us here in Belize, and we do have fishermen from those countries that fish illegally in Belize quite often.”

This issue was also reported in several archival documents that noted spillover impacts of illegal fishing activities. The archive documents focused on IUU fishing were government reports listing concerns for the management of coastal resources. With every report, IUU fishing was at the top of the list. In government reports dated after the pilot launch of the MAP, the concern about IUU fishing widened to global impacts. In the documents dated after 2011, there was more information regarding worldwide fish stocks being overharvested due to IUU fishing activities.

In other interviews or other parts of an interview, some participants would allude to or describe IUU fishing activities without explicitly stating that it is IUU fishing. A key informant stated,

“I think in terms of compliance, one of the ways fishermen will resist is not filling out the logbooks or not filling them out accurately.”

Since logbooks are the method in which the amount of fish being caught is being recorded, not filling them out accurately or at all contributes to the unreported part of IUU fishing. It is important to understand both the explicit and in-explicit descriptions of IUU fishing activities concerning the management regime, given that one of the goals of the MAP was to decrease those types of actions. Almost every participant mentioned IUU fishing activities in one way or another, putting it at the forefront of concerns for the management transition.

IUU fishing and the last interview excerpt, in particular, bring up two other major areas of concern that were discussed during the interviews. As the participant mentioned in that last excerpt, some fishermen are not complying with certain aspects
of the new management policies. A key part of compliance is having ample enforcement efforts to ensure compliance. This is another central discussion point throughout the interview process. When speaking with one fisher about areas of management he would like to see improve, he stated the Fisheries Department should ‘step up their game’, and when I probed further, asking ‘In what way?’ he spoke further, stating,

“With the penalties and overseeing of the reserve. In front of the island is a reserve, and then we have one more north of here. But a lot of fishermen will go out at 3 or 4 in the morning and fish and mess it up. They’re not allowed to fish that late, but they just do their thing. I don’t like it.”

He made it clear that he does not approve of the illegal activities in the fishing areas and that the lack of enforcement in the form of penalties and monitoring are impacting those areas. This theme of needing to increase enforcement measures was highly present in archival documents as well. One report stated:

“Recommendations were given to the Fisheries Department including increasing patrolling, education, research, and communication with users” (ERC 614).

Another archival record in the form of an educational assessment that interviewed local fishers reported that 40% of the fishers they spoke with thought the Fisheries Department was not doing enough to enforce regulations (ERC 169). However, this is not to say that there are no enforcement efforts or enforcement of the regulations. That same assessment reported that 60% of fishers they spoke with thought the Fisheries Department was doing an adequate job. A key informant I spoke with gave an example when I asked if they thought illegal fishing is a current problem in Belize, stating:

“We had some fishermen when I was just about to open. They had caught lobsters from the day before the season started. You aren’t supposed to do that.
You’re supposed to wait until the day it opens. Fisheries department found out, and they got charged for each one. It’s about 50 dollars per lobster.”

In this explanation, the fisher is retelling a story about when the Fisheries Department caught a group of fishers catching lobsters before the lobster season started and fined them 50 Belizean dollars per lobster. This showcases enforcement efforts by the Belize government for the new MAP policies. However, it is important to keep in mind the conversation with the other fisher who spoke about a group going out to fish in the middle of the night when they are not supposed to and not getting penalized. From key informant interviews and archival records, it is clear there are enforcement measures in place to deter illegal fishing activities, but they are lacking in sufficiency. Digging deeper into the cause of this issue leads to the next major concern for the MAP, which is funding and resources because it is through those two things that adequate enforcement can be implemented. One participant stated this eloquently, saying:

“They don’t get the funds from external funders or the government, and then the fishermen don’t care to comply if there are no sanctions in place to punish wrongdoers.”

This person noted the difficulty in executing enforcement regulations when there is little to no funding to help do so. The consequences that come from this are non-compliance and, ultimately, illegal fishing activities. Interview discussions differed in their exact content, but when it comes to areas of concern or areas in need of improvement, they built on each other and filled in gaps that the other was missing. A lack of funding leads to a lack of adequate enforcement measures, which leads to non-compliance to regulations and, in turn to IUU fishing. Issues and concerns regarding Managed Access are critical to understand because it indicates what aspects of the policy are in need of improvement.
4. Perceptions and Experiences

A. Fisher Experiences and Perceptions

Another key aspect of this study was understanding perceptions of the management transition. Part of this entailed interviewing fishers to gain their perspective on the industry and their lives before and after the new policy implementation. One of the first questions I asked fishers was where they learned to fish, as I wanted to know if they were new to the trade or if it was a family tradition. The generational fishing is predominantly between the male household members, based on conversations with interview participants. Out of the fishers I talked to, there was only one that did not learn from their family, making generational fishing the norm among the key informants.

The one fisherman that learned elsewhere stated:

“I just went out with my friends one day and started fishing. When I first started, I was struggling, but eventually, I got used to it. My friend was a fisherman, and at the time, he didn’t have a job, so he was fishing for survival.”

This person brought up an important part of a fisher's experience which is fishing for survival. Although this was not his personal experience, it is important to understand nonetheless. Regarding changes in the fishing industry, some fishers noted significant differences between before and after the MAP implementation, while others did not. The ones that did not note any differences made it clear that they still fish, they still catch, and they still sell, therefore deeming the policy shift as a non-issue in their livelihood.

B. Non-Fisher Experiences, Perceptions, and Observations
I interviewed several non-fishers as key informants as a part of this study. I asked for their personal observations regarding the fishing industry and the fishing experience because I was interested in gaining multiple perspectives. One common observation amongst non-fisher interview participants was that they noted fishers have multiple sources of income, which was also supported in archival documents. When I asked one key informant about fisher livelihood after the MAP implementation, they said,

“One fishers in Monkey River are also in the tourism business, so in that respect, they’re doing just fine but not because of fishing but because of tourism.”

They gave an example of a specific fishing coastal community that could be deemed ‘fishing dependent’ but noted their well-being could not be isolated to improved fishing efforts. An archival document written in 2014 in the form of an educational assessment supported the observation of fishers diversifying and stated,

“One many small-scale coastal fishers struggle to sustain their livelihoods and are seeking out alternative sources of income, especially in the expanding tourism sector” (ERC 735).

However, a key informant went on to speak more generally about community well-being and fisher livelihood, stating:

“I’m not sure if it led to an increase in job security for fishermen. If anything, I think it might have made things a little more constrained for some folks. Because of how they get their licenses if they historically fished in an area.”

It has been observed that the change in how fishers gain access to commercial fishing licenses is more complicated than it was before the new policy, which increases the level of difficulty in the ability to employ a person. When employment opportunities decrease in one field, looking for employment in others would make sense. The socio-economic fallout of needing to diversify in employment sectors can have its own set of
impacts, which makes this a critical aspect of the study to note. On the other side of
the spectrum regarding well-being and livelihood is another non-fisher observation in
which a key informant stated,

“I have seen since 2011 when managed access got implemented, I have seen
our fishers doing better economically just from my observations. I see them
getting new boats. I see them having vehicles that I know they didn’t have be-
fore. I see them living in better housing” . . . “So I can see a difference in their
way of life, like more of their children, are going to school, are going to Uni-
versity. I remember when I started here, there was maybe one child of a fisher
going to junior college. I’ve seen more and more of them finishing high school
first of all and then also a few of them moving on to tertiary level education. So
hopefully, I think that a few families have done and are doing well from fishing
because they have not diversified. They have remained in the fishing industry,
and I’ve been able to observe a different way of life for them, so that’s good.
Others have diversified, so they have not relied solely on fishing; they do other
jobs for their income.”

This explanation came from a non-fisher local Belizean with expert knowledge about
this topic, and they have noted a positive correlation between Managed Access and so-
cioeconomic factors for fishers. They make it clear that when fishers diversify in the
job market, it is an indicator of a decrease in socioeconomic prosperity. They give ex-
amples of indicators of a positive socio-economic change. One example was children
of fishers going further in their education, and another was fishers getting new boats.
It is important to point out that one key informant discussed diversification amongst
fishers as a contributing factor to their increased socioeconomic prosperity, while an-
other deemed diversification amongst fishers as a negative indicator. These conversa-
tions with non-fishers on their observations contradict each other since some note a
negative impact and others a positive one.
1. Fisheries Management in Belize Before 2011

Socioeconomic Trends and Fishing Community Well-Being

Gross domestic product (GDP) represents the total dollar value of all goods and services produced by an economy and is often used as an indicator to track the health of a country’s economy (Kramer, 2022). The Belize fishing industry is sensitive to change and external shocks. The GDP of the fishing industry fluctuated quite a bit between 2000 and 2010, ranging from $53.5 million BZE to $147.2 million BZE. For example, in 2007, the fishing market crashed, hitting the decade’s lowest GDP of $53.5 million BZE. This coincides with the global financial crisis, which originated in the United States in 2007 (Helleiner, 2011). This is important to note because 90% of lobster, conch, and farmed shrimp in Belize were exported to the United States (Belize Fisheries Department & Wade, 2005). Therefore, when the US economy plummeted, Belize’s fishing industry was also negatively impacted. Another example is Belize’s vulnerability to hurricanes, which cause damage to tourist destinations as well as boats, equipment, and the environment. These damages cost millions of dollars to the fishing industry, which can exacerbate the inability of communities to meet basic needs.

From 2000 to 2010, the national population grew exponentially, and labor force participation remained steady. However, unemployment rates fluctuated rapidly each year, reaching a high percentage in 2007, followed by a quick decline in 2008. A
standard assumption regarding the relationship between the labor force and unemploy-
ment rates would be that labor force participation would decrease as unemployment
rates increase. This would be due to individuals who were previously in the workforce
not having employment. However, it can be argued that when unemployment rates are
high, women enter the workforce to add to the household income making the labor
force participation appear strong despite the number of individuals in the workforce
without employment (Emerson, 2011). This could explain the steadiness in the labor
force participation even with the highly fluctuating unemployment rates. Although I
cannot conclusively claim that women entering the workforce is the reason for their
continued participation in the labor force despite the increase in unemployment, I can
note the trend. While these numbers are not specific to the fishing industry, they are
still relevant given the industry's prominent role in these factors.

Two other related factors to socioeconomic impacts are the number of total
major crimes and incarceration rates. Similar to unemployment, labor force participa-
tion, and population, these numbers are not specific to the fisheries sector but repre-
sent the entire country. Thus, I cannot claim the number of total major crimes and in-
carceration to be the sole indicator of well-being for fishers. However, I can note the
trends from these factors in conjunction with excerpts from both the interviews and the
archive documents to further explain the national trends. While collecting demo-
graphic data from the Statistical Institute, I found that the records for total major
crimes are only available in 2009, while data for incarceration rates started in 2000. It
is important to note this difference in data availability because it does not give a com-
plete picture of the relationship between total major crime rates and incarceration rates
for the years leading up to the Managed Access Program. Nonetheless, the number of
total major crimes did decrease from 2009 to 2010, while the incarceration population
increased exponentially from 2000 to 2006 and increased significantly between 2008
and 2010. Incarceration rates might not necessarily decrease despite the number of
major crimes decreasing because sentences for crimes can be long. Another important
thing to note is that the Belize Police Department categorizes murder, rape, robbery,
burglary, theft, and unlawful sexual intercourse as major crimes. The number of total
major crimes remains relevant to this research because an overall sense of safety is
still important to community well-being. However, illegal drug activity and illegal
maritime activities do not count as part of major crimes, and information about those
specific activities was not found during my research. Illegal drug activity was explicit-
ly mentioned in one of the archive documents as being a major source of extra cash
for Belizean fishers. Other archive materials noted the downward trend in major crime
during this period and noted an overwhelming opinion that law enforcement is inade-
quate. This inadequacy could deter residents from reporting criminal activity, as it
nearly did for me. During my time in Belize, I spent several hours on multiple occa-
sions with law enforcement, most of which was spent waiting in tremendously long
lines to speak with an officer. I witnessed people leave while waiting in unorganized
lines. While my observations are not finite or conclusive, they offer insight into the
criminal activity reporting process. Despite these decreasing crime trends on the na-
tional level, the notion of illegal maritime and drug activities cannot be dismissed,
given that those two are directly related to Belizean fishers. Regarding fisher's well-
being in terms of safety, interviews and archival data suggest fishers (particularly in
southern Belize) were at great risk of involvement in unsafe and illegal activities. Although there is no data from the Statistical Institute to support this, archival documents continually discussed illegal maritime activities from the years 2000 to 2010, making it a common theme.

The connection between secondary school enrollment and poverty to fisher livelihood was made during several interview conversations. Key informants noted this connection to fisher’s children as an indicator of increased wealth. Between 2000 and 2010, secondary school enrollment in Belize increased exponentially. A 2002 poverty assessment report found in the archives discussed secondary education in Belize being the least available to those in poverty due to the cost of attending. The same report had noted 33.5% of Belize to be poor and around 10% to be very poor. The assessment also dives into housing and health care stating poor households are less likely to have adequate housing (i.e., electricity) while access to health care seems more reasonable. With public health care visits costing as little as $8, it is comparably a more practicable cost relative to other aspects of living in Belize, like the cost of secondary education. These numbers are national rather than specific to the fishing communities but are included because of their socioeconomic relevance to well-being. National statistics are not specific to fishing communities, but they highlight trends supported by archival and interview data specific to those communities.

Breslow et al. (2016) uses a ‘4c’ conceptual framework to measure community well-being where safety, the economy, and health each play an important role in indicating human well-being as part of the ‘conditions’ constituent where basic needs are assessed. We can think of the economy being represented in this study as employment
and labor force participation. While this framework was not explicitly adapted for this study, it remains a noteworthy point given the framework’s relevancy to well-being specific to fishing communities. It further strengthens the legitimacy and validity of the findings from this particular study given the similarities of indicators used in both projects.

*Fisheries Management and Fishing Community Well-Being*

Understanding social and economic factors is critical to comprehending where those factors fit into fisheries management. Before the implementation of the MAP, Belize fisheries operated under an open-access regime. According to interviewed key informants, there were regulations in place on certain species, but overall, it was deemed a ‘free for all’ system. There were no restrictions on the number of fishing licenses that could be granted or on the types of gears used and few restrictions as to where fishers could go. The only restrictions to locations came from Marine Protected Areas that had been established as Conservation Areas and No Take Zones. Archival and interview data indicated overfishing as the major concern during the open-access regime. Regarding fisher well-being, overfishing can lead to a reduction in catch, making the activity less profitable and leading to financial hardships like unemployment (Ikechi-Uko, 2020). There is no explicit evidence from the archival or interview data to confirm that Belize’s fish stocks were that low, but it was heavily insinuated by key informants that continually expressed declining fish stocks as being a concern. Annual reports I read from the archives described an increasing number of fishers during this time, which only exacerbated the stress on fish stocks. Coupled with the open-access
regime’s lack of regulations and the understanding that fish stocks were declining, an increased number of fishers would likely have contributed to overfishing.

Another set of contributing factors to overfishing and declining fish stocks during the open-access regime of fisheries management was IUU fishing and the increase in tourism. Several archival documents I read reported increases in the Belize tourism sector. Tourism is relevant to fishers for a couple of reasons. First, it is common for fishers to supplement their income by working as tour guides, so when the number of annual tourists increases, that aspect of the fisher’s income also increases. Second, Belize is a popular area for eco-tourism focused heavily on marine activities like sports fishing, snorkeling, and scuba diving. Sports fishing is a known competitor to commercial fishing in Belize since they both strive for similar species. Therefore, as tourism increases, so does competition for those species through sports fishing. Third and lastly, an increase in tourism means increasing the local demand for seafood. Economically, it makes sense that with increases in demand and in the number of suppliers—fishers—regarding a limited resource not being adequately managed—fish—that are not being adequately managed, the resource would decline. Another factor contributing to declining fish stocks is Illegal, Unreported, and Unregulated fishing activities. Data from archival documents and interviews listed IUU fishing as a major problem, particularly in southern Belize, where Guatemala and Honduras are geographically closer. Fishers from Guatemala and Honduras commonly fished in Belizean waters, thus engaging in illegal, unregulated, and unreported fishing activities. This type of transboundary fishing negatively impacts fish stocks because it increases the number of
vessels catching fish. The activity is not tracked, making it increasingly challenging to monitor fish species abundance.

*The Role of Government and Non-Government Organizations in Fishing Community Well-Being*

In the years before implementing the Managed Access Program, government and local non-governmental organizations (NGOs) had previously worked together to form multiple MPAs in Belize’s territorial waters. This is important to note because it establishes a history of co-management regarding marine resources between the two types of organizations in the country. Water resource management is not limited to MPAs, but instead includes the management of other physical and biological components that benefit human life like oil, minerals, and fish. For a coastal nation like Belize, marine resources are a critical component of well-being because the resources are an essential part of the economy and livelihoods. Regarding government organizations and NGOs, there was a consensual understanding by the mid-2000s that to help improve conditions in poor households, there needed to be an advancement in water resource management policies. This information comes directly from the archives from a transcript of a speech from a Belize government official to the United Nations. The idea being that by investing in marine resources like fisheries, there would be an increase in national wealth that could help poor households. “Poor households” was not and is not a synonymous term with fishing communities. Therefore, I cannot conclusively claim that the Belize government was explicitly declaring its intent to solely help fishers. However, poor households certainly exist within the context of fishing
communities. For instance, in one of the interviews, Monkey River in the Toledo District in southern Belize is specifically mentioned as a fishing community. Consequently, archival documents reported that the Toledo district has the highest poverty rate in the country. The water resource management policies the Belize government was addressing in its statement to the United Nations that were found in the archives are connected to these fishing communities.

A common theme regarding government and non-governmental organizations in Belize in the decade leading up to the pilot launch of the MAP was the difference between internal and public perception of the organizations. Meaning the difference between what organizational reports claimed to be doing to what the general public believed. Archival data suggests that general public perceptions of the organizations during this time were highly negative. For example, government reports discussed community programs that were made available to locals, like tour guide training classes. However, these programs are brought up in other archive materials focused on the public perceptions with a purely negative connotation. This connects to fishing community well-being because the organizations aimed to help improve community well-being, including fishers, by creating those programs. Therefore, when the general public holds a negative view of them, it can indicate an issue with the program that has resulted in the opposite of its original intent. In the case of the tour guide training classes, the original intent was to help local Belizeans become certified tour guides. However, negative public perception fostered feedback from locals who reported a lack of follow-through by the organization. Meaning that once locals became certified, they
did not receive any support from the organization. Thus, while the original intentions were good, the program was unintentionally not increasing community well-being.

2. Fisheries Management Post-MAP Implementation

Socioeconomic Status and Fishing Community Well-Being

From 2012 to 2014, the national fishing industry GDP in Belize increased before subsequently decreasing from 2014 to 2016. Since 2016, the GDP has remained in the high to mid $20 million range, fluctuating only slightly. It is critical to note that the pilot launch of the MAP took place in 2011, but only in parts of southern Belize. Therefore, it is unlikely that the changes in these numbers represent the impacts of the MAP. Instead, it is perhaps a testimony to the national implementation of the MAP that the GDP has remained relatively steady since 2016 after plummeting from $82.6 million to $29.5 million. Although there is no explicit evidence supporting that claim, it seems more probable given the fishing industry GDP is a national representative, and 2016 was the year the MAP was nationally implemented.

Regarding national unemployment numbers, 2012 hit a high of 14.4% with no explanation from archive records or interviews. From 2016 to 2019, the percentage of national unemployment was steadily decreasing. Meanwhile, national labor force participation was increasing. This makes logical sense, given that as individuals enter the workforce, the number of unemployed people goes down. Although, I cannot conclusively claim that the sole reason for the decrease in unemployment and increase in labor force participation between 2016 and 2019 was because of the national implemen-
tation of MAP in 2016. However, I can note the trend in both of those factors and un-
derstand the timeline correlates with the national implementation of Managed Access
in one of the most economically productive job sectors in the country.

Another incredibly economically productive sector in Belize is the tourism sec-
tor, where a 2011 archival report claimed the sector held 28% of national employment. The number of tourists and the tourism sector increased exponentially from 2011 until the beginning of 2020, when the global pandemic seized travel. Setting aside the im-
pacts of the global pandemic, the increase in tourism between 2011 and 2019 likely contributed to the decrease in unemployment. It increased labor force participation due to the high percentage of national employment. This directly connects to fishers’ well-
being because fishers often supplement their income by working in the tourism indus-
try. With fishers often working in tourism, it is difficult to know if increased well-be-
ing can be attributed to Managed Access. This point was discussed in interviews where a key participant noted that some communities, like Monkey River, are doing well but that it is not a reflection of the MAP, but instead, it is because of tourism.

Secondary education enrollment is another indicator that was used for this re-
search. From 2011 to 2015, there was an exponential increase in national enrollment. It is important to note that the time frame for this was before the national implementa-
tion because it contributes to the understanding that there is no explicit evidence from the data to support a claim that the pilot launch of the MAP was the sole reason for the national increase in enrollment. From 2016 to 2017, enrollment decreased slightly be-
fore increasing in 2018, and enrollment remained steady in 2019 before increasing again in 2020. The changes in national enrollment starting in 2016 are more likely to
be the result of Managed Access, given that was the year it was nationally implemented. Information from interview data directly stated a connection between Managed Access, increased fisher well-being, and secondary education enrollment. The key informant noted their personal observation regarding fisher well-being by reporting an increased number of children of fishers going to secondary school and pursuing university-level education. Therefore, regarding this specific socioeconomic indicator, the data suggests increased fisher community well-being as a direct result of the MAP policy.

*Changes in Fisheries Management and Impacts on Fishing Community Well-Being*

The majority of the data representing post-MAP implementation was collected from key informant interviews. Managed Access began with two pilot sites in southern Belize in 2011 before being nationally implemented in 2016. The program aimed to restrict access to its fisheries through a new licensing process in which applicants now need approval by the Managed Access Committees before they can be granted a license. A few locals from the community are voted into the committees. Information from interviews detailed how this process has become personal and biased, as committee members advocate for family and friends to gain licenses while rejecting others they do not personally know. In fairness, part of the selection criteria for applicants is having fished historically in the areas they are applying for, so if local community members do not know them, it is likely they have not historically fished in those areas. Since Belize is a relatively small country with even smaller fishing communities, there is a sense that everyone knows each other. Nonetheless, the lack of ability of committee members to remain impartial is a concern for the program. This is of particular
concern for well-being because rejecting fishing licenses restricts employment, potentially causing a plethora of other socioeconomic issues. For instance, if a fisherman is rejected a license leaving them without employment, they may fall behind on bills while looking for other employment.

Another concern regarding the MAP is the lack of compliance with certain regulations as required through the mandate. The policy requires licensed fishers to color-code their boats in conjunction with the areas they are licensed to fish in. This allows for law enforcement and monitoring vessels to clearly see if a boat is out of its designated areas. The issue comes from fishers not complying with this regulation by not color-coding their boats. Another requirement of the program is for fishers to fill out logbooks to record their catch which is then given to the fisheries department or one of the NGO co-managers. This is to help assess fish stocks which is a critical component to keeping the fish stocks at a sustainable level. However, this, too, is being met with noncompliance amongst fishers. Noncompliance with fisheries regulations is a dangerous game to play for fishers because it is the regulations that aim to promote the longevity of the fisheries, and without them, the fish stocks are at risk of being overfished. Naturally, this is a concern for well-being because if the fish stocks decline as a result of noncompliance, it begins a negative ripple effect in the industry. Declining fish stocks means decreased GDP and increased unemployment in that sector which negatively impacts households in regards to food security, housing, education, and health care.

Managed Access set out to decrease the amount of IUU fishing activities occurring in Belizean waters. IUU fishing was continually listed in pre-2011 archival
documents as one of the major problems facing the fishing industry. The pilot launch in southern Belize, where there was a high level of illegal activity taking place from Guatemalan and Honduran fishers, reportedly saw a decrease in IUU fishing. Therefore, one of the hopes in its national implementation in 2016 was to decrease this activity in other areas. Unfortunately, information from the interviews explicitly discusses IUU fishing as an ongoing concern both domestically and foreign. As previously mentioned, noncompliance amongst fishers regarding catch reporting was discussed. Failing to report catch or falsely reporting catch falls under the premise of IUU fishing and is therefore an example of domestic IUU fishing activity. According to interview data, foreign vessels are still fishing in Belize waters, contributing to IUU fishing activity as well. IUU fishing is a concern for well-being for similar reasons discussed in the previous paragraph. IUU fishing makes it difficult to determine accurate stock assessments, which can lead to overestimating the number of fish, therefore, contributing to overfishing and the decline of fish stocks. When fish stocks decline, catch per unit effort is impacted because effort increases, but catch does not. This can result in a decline in employment in the fishing industry, a decrease in the productivity of local economies, and an increase in the number of households unable to meet basic needs.

Perceptions of the transition from open access to the now Managed Access Program are critical to note because they allow insight into well-being. Key informants from interviews were asked about their observations regarding well-being and Managed Access. There were mixed and contradicting answers to these questions, which creates difficulty in aiming to answer the research questions. The overarching
research question centered around understanding the impacts of the MAP on community well-being. Our fishing communities are better off than they were before. Is there an increase or decrease in well-being? Some fishers did not report any major changes in their livelihoods from before Managed Access to now. However, others did report major changes in the amount of fish they are catching and the increased effort it now takes to catch the fewer fish. An important note of this difference in responses is the geographic location in which these fishers were located. Not every fisher that responded with no major changes was in the same place as those who responded with notable changes in the industry. This means it is likely that the geographic location of fishers has a role in determining well-being. Job satisfaction was not explicitly measured in this study, but it came up in the interview process and is another component of individual perceptions as they relate to community well-being. In interviews with fishers, the most common view was the various changes in fisheries and the challenges they have brought. There was an overarching sense of frustration but acceptance and understanding amongst fishers of why restrictions have been put in place. Generally speaking, based on the results, fishers feel highly regulated, which left a negative connotation, but most of them expressed a deep understanding of the importance of preserving fish stocks. This indicates a negative level of overall job satisfaction amongst Belizean fishers, which is another key component of community well-being (Satumanatpan and Pollnac, 2017; Seara et al., 2017). It is important to note here that the literature supports the overall finding of dissatisfaction amongst Belizean fishers regarding management. A study looking at Belizean fishers well-being through inter-
views, found satisfaction of management to be the lowest scoring variable and the results of this study indicate negative perceptions of management from fisher’s perspectives (Monnereau and Pollnac, 2012). Observations from non-fishers were also contradictory regarding well-being. Some key informants discussed MAP making things more constrained in terms of employment rather than increasing job security. Others noted the opposite impact as they reported seeing fishers buying better boats and vehicles, being able to send their children to school, and seeing fewer fishers diversify in employment. Both of these can be true because, again, it is likely that geographic location plays a role in fishers' well-being.

The Role of Government and Non-Government Organizations in Fishing Community Well-Being

Managed Access was implemented and is overseen by government and non-government organizations; as such, their actions play a role in the well-being of fishing communities. Thus, it is important to note aspects of these organizations that need improvement versus components that are doing well and contributing to increased well-being. In the conversations with interviewees, there was an overarching feeling of frustration with the government's lack of ability, capacity, resources, and consistency. Several key informants noted a rapidly changing government to be the source of multiple issues. For example, ministries are required by law to send annual reports to the Archive and Records Service. However, with a lack of consistency through a continually changing government, reports are not sent in. This disrupts the ability of others to do their jobs which fosters this feeling of frustration by the general public. Based on
the data, there appears to be a disconnect between the government and the communities. One archive report explicitly recommended increasing communication between the Fisheries Department and the communities in an effort to maximize efficiency regarding management. Non-government organizations are generally discussed more positively in the post-MAP data, which pertains mainly to local NGOs.

International NGOs were criticized for acting in a colonial manner regarding the MAP implementation because they spearheaded the transition only to pull out of Belize once it was implemented. These NGOs came to Belize with funding to implement Managed Access and then left Belize along with their resources. This left Belize to carry on with the program without the capacity and resources to successfully manage it. This brings me to my final point, the lack of funding and resources for these organizations is directly connected to non-compliance issues. In the previous section, I discussed issues of noncompliance and IUU fishing activities in Belize; those two concerns are fueled by a lack of government and NGO capacity through lack of funding and resources. This was explicitly mentioned in interviews by multiple key informants. To properly enforce regulations like color-coding boats and logbook reporting, there have to be people trained to do so. Hiring and training cost money, as does gas for boats to patrol. With a lack of funding, it is incredibly challenging to meet those needs. This is perhaps the main concern for Managed Access because, without capacity and resources, the program will not be able to address the other issues at hand.
CHAPTER 6: CONCLUSION

Belize has been a leader in marine conservation for decades, and its transition to a rights-based approach as a management solution holds true to that fact (Wade et al., 2019; Fujita et al., 2017). This study set out to answer one overarching research question: What are the socioeconomic impacts of fisheries management policies?

To answer this question, it needed to be broken down into sub-questions that would help organize different components of the answer. The first sub-question aimed at identifying the socioeconomic status of coastal fishing communities before the 2016 national implementation and the 2011 pilot launch of Managed Access. Demographics from the Statistical Institute of Belize, archive documents, and interviews with key informants helped answer this question. In terms of safety, the number of major crimes was decreasing, but the incarceration rate was increasing, making it likely that other non-major crimes were occurring. This is not ideal for a community because safety is a key aspect of well-being. The number of children enrolled in secondary education increased during this time, indicating that more families could afford to send their children to school. The GDP during this period was relatively high, indicating that the fishing industry was doing well economically. Despite high numbers of GDP, the fish stocks were declining as they were likely being overfished due to the open-access regime. Adding to this notion was the increase in tourism. More tourists mean higher local seafood consumption. Tourism also boosts local economies. Therefore while fish stocks were decreasing, the communities were economically well off. Overall, before Managed Access was implemented, the information from the data suggests Belize fishing communities were economically prospering, leading to certain social benefits
(i.e., sending children to secondary schools) while other social factors were occurring negatively (i.e., incarceration rates).

The second sub-research question focused on how the communities were impacted socioeconomically after Managed Access was implemented, while the third question is focused on perceptions of the management shift. After both the 2011 pilot launch and the 2016 national implementation of the Managed Access Program, GDP has decreased dramatically from what it was before 2011. It has remained stable in its low range since 2016, which is potentially a positive reflection of the MAP, given that it has not decreased again. Unemployment and labor force participation rates suggest more Belizeans are entering the workforce, but this is not specific to the fishing industry. Although the tourism sector was increasing before the pandemic, those numbers (unemployment and labor force participation) likely represent the growth in that industry. The tourism industry is well connected to the fishing industry, with an increased number of tourists equaling an increased demand for local seafood. However, the pandemic greatly impacted tourism in Belize negatively, and it is still in the process of building itself back up. Information from the data suggests certain communities are doing better than others, given contradictory reports. Differences in observations do not mean any of them are untrue. It simply suggests different perspectives and experiences. Some key informants reported increased community well-being, while others reported a decreased sense of well-being. However, most key informants perceived this management shift negatively in terms of well-being but expressed understanding
of its necessity. Overall, despite negative perceptions regarding the impacts of Managed Access, other information from the collected data suggests increased community well-being from the selected indicators.

Several key concerns were identified throughout the research process regarding the program, which leaves room to address recommendations to increase socio-economic well-being for the fishing communities in Belize. First, funding and resources pose a major challenge for government and non-government organizations to properly and efficiently manage the program. There is a deep realization that is simply recommending to increase funding and resources does not solely create action to do that. However, the importance of both cannot be overlooked or overstated. Increasing both funding and resources to government and non-government allows for increased patrolling and enforcement efforts. The second major concern regarding this program is the lack of compliance amongst Belizean fishers regarding color coding their vessels and filling out logbooks. Increasing funding to increase patrolling and enforcement efforts will ideally lead to an increase in compliance with those regulations. Lastly, increasing government communication and transparency to communities is critical. There is an overwhelming feeling of disconnect between the government and the people creating confusion and frustration. To increase community well-being, it would be beneficial for community members to have clear communication with government offices and officials.
WORKS CITED


Belize Fisheries Department, & Wade , B. A., Belize Fishery Country Profile and Information (2005). Belize City, Belize; Belize Fisheries Department.


