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# Matching Supply and Demand in the Responsible Fishing Supply Chain Based in Costa de Pájaros

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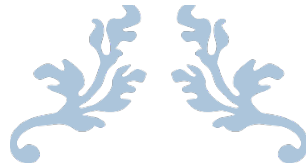


**WPI**



Submitted by:

Whitney Davis, Androniqi Qifti, April Solon, Nathan Stomberg  
May 1, 2016



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# Matching Supply and Demand in the Responsible Fishing Supply Chain Based in Costa de Pájaros

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An Interactive Qualifying Project  
Submitted to the Faculty of  
**WORCESTER POLYTECHNIC INSTITUTE**  
in partial fulfillment of the requirements for the Degree of Bachelor of Science by:

**Whitney Davis**

**Androniqi Qifti**

**April Solon**

**Nathan Stomberg**

Faculty Advisors: Melissa Belz & Derren Rosbach

Sponsor: The MarViva Foundation



**WPI**



# Abstract

Responsible fishing is necessary to protect against the overharvesting of marine wildlife, but the current market for responsibly-caught fish is too small to make a big impact. Our team assisted the MarViva Foundation in identifying and connecting the prospective supply and demand for responsibly-caught fish in a new supply chain based in Costa de Pájaros, Costa Rica. We interviewed and evaluated receiving centers and restaurants to assess which had the most potential to be successfully paired as a new supply chain relationship, bringing fish to more consumers. We also surveyed consumers to determine their awareness of responsible fishing, recommending the best advertising methods to increase end consumer demand for responsibly-caught fish.

# Acknowledgements

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## FISHING FOR NEW MARKETS

### Overfishing and its Effects on the Marine Environment

One of the most important food sources in the world is experiencing rapid depletion and facing irreparable damage. Indeed, fish are in danger, and they are heavily relied upon across the planet for both nutrition and livelihood. Unfortunately, this sensitive resource is not being used at a sustainable rate. With the rise of unsustainable practices, the world's fish populations are in great danger.

Presently, almost all of the seafood consumed in Costa Rica is caught domestically, placing great pressure on the local fishing industry for fishers to maximize their catch in order to meet the demand. As a result, fishermen use unsustainable practices to catch the greatest number of fish. The increase in unsustainable practices caused the MarViva Foundation, a non-profit organization dedicated to protecting the marine ecosystem, to take action in protecting the marine environment, focusing specifically on the fishing supply chain.

### The Responsible Fishing Supply Chain

Previously, MarViva worked on establishing a particular responsible fishing supply chain in Costa de Pájaros, a village by the Gulf of Nicoya on the Pacific coast of Costa Rica. In this supply chain, fish are caught using responsible methods and sent to the receiving center Cama Pez de la Costa, where the fish are inspected, prepared, and sent to the restaurant Isla Coco's in Puntarenas, where the end consumer buys the fish. An overview of this chain is shown in Figure 1 below. Building on the success of the established responsible fishing supply chain, we aided MarViva in creating a new one between Costa de Pájaros and Monteverde.



Figure 1: A flowchart describing the responsible fishing supply chain.

While receiving centers that distribute responsibly-caught fish already exist in Costa de Pájaros, they have established relationships with a balance of supply and demand. Just adding buyers from Monteverde would not make sense, as it would only disrupt this balance, leaving the new corporate buyer without enough supply. Thus, it was necessary to form a new relationship in a prospective supply chain between a receiving center in Costa de Pájaros and a restaurant in Monteverde. We sought to aid in the creation of this new chain with our project. Figure 2 below shows a map of both supply chains.

## Project Goal and Objectives

The goal of our project was to analyze the fishing supply chain based in Costa de Pájaros, Costa Rica, in order to help MarViva create a relationship between a new supplier and a new corporate buyer for a new responsible fishing supply chain. To achieve our goal, we set four objectives that focused on the three major components of the supply chain: the receiving centers, corporate buyers, and the end consumers.

### 1. Determining Criteria to Assess Receiving Centers and Corporate Buyers

To meet our first objective, we interviewed the two businesses that comprised a successful responsible fishing supply chain in Costa de Pájaros, the receiving center Cama Pez de la Costa, and the restaurant Isla Coco's Bar and Grill. Using Cama Pez and MarViva's expectations of receiving centers as a model, we set four criteria to judge the prospective receiving centers: overall hygiene, transparency of the receiving process, value of stable business relationships, and attitude towards responsible fishing. Based on the example set by Isla Coco's and MarViva's expectations of corporate buyers, we also determined four criteria to evaluate the prospective restaurants: prioritization of product quality, willingness to incorporate alternative species on the menu, value of stable business relationships, and attitude towards responsible fishing.

### 2. Assessing the Potential of Receiving Centers in Costa de Pájaros

To accomplish our second objective, we interviewed the owners of the prospective receiving centers using semi-structured interviews. We then analyzed the information collected based on our four criteria for prospective receiving centers and assessed which supplier showed more promise for the new supply chain.

### 3. Assessing the Potential of Corporate Buyers in Monteverde

For our third objective, we conducted semi-structured interviews with nine prospective restaurants in Monteverde to evaluate their potential for the new supply chain. We then analyzed the data using our four criteria for prospective corporate buyers to determine which restaurant was the most qualified candidate.

### 4. Understanding the End Consumer

Finally, to achieve our fourth objective, we conducted surveys of consumers in order to identify the level of their awareness and their demand for responsibly-caught fish, making corresponding recommendations about the consumer in support of the supply chain. We surveyed 45 customers at Isla Coco's restaurant over the course of three mealtimes during one weekend. With these surveys, we evaluated the current consumer demand for responsibly-caught fish and gauged the consumer knowledge of responsible fishing.



Figure 2: A map showing the established and prospective supply chains.

## Key Takeaways

### The Most Qualified Receiving Center and Restaurant

After analyzing the data collected from the interviews, the Pescadería las Palmas receiving center and Restaurante d’Sofia were the most qualified candidates and were best suited to be matched in the new supply chain. Pescadería las Palmas was distinguished due to their transparency of process, reliability of supply and enthusiasm for responsible fishing. Restaurante d’Sofia was differentiated from the eight other restaurants we interviewed by their desire to serve a quality product, willingness to incorporate alternative species on their menu, and overall positive attitude towards responsibly-caught fish.

### Consumers Will Pay More, but also Need More Information

During our survey of consumers at the Isla Coco’s restaurant in Puntarenas, we found that not only were the customers interested in responsibly-caught fish, they were also willing to pay more for it. However, the average consumer does not understand responsible fishing well enough to articulate what it is. Since the consumers impact the entire supply chain, it is important to advertise responsibly-caught fish and increase consumer awareness in order to support both the existing and the potential fishing supply chains.

## Moving Forward

After assessing the businesses and determining the ones with the best potential for success in a new supply chain, we concluded that Pescadería las Palmas and Restaurante d’Sofia have an outstanding potential to be partners in the new responsible fishing supply chain. To facilitate the formation of the new relationship and the transition to responsible fishing methods, we recommended that MarViva send a representative every other week to oversee changes to the receiving center. These changes include renovating the facilities to promote better hygiene, ensuring the use of responsible fishing methods and the thorough inspection of fish, and the timely storage of the fish on ice.

We then determined how best to target consumers of fish to inform them about the benefits of responsible fishing. Based on the lack of consumer awareness we found at Isla Coco’s, we concluded that restaurants selling responsibly-caught fish should advertise its sale and inform their customers of its benefits. The promotion of responsibly-caught fish can be achieved through various means, such as pamphlets on the tables of the restaurants, advertisements of responsibly caught fish on the menus, and T-shirts (seen in Figure 3 below) with slogans that underline the importance of the responsible fishing for the environment. A sample advertising poster can be seen in Figure 4.



Figure 3: T-shirts promoting responsible fishing.

## Conclusion

When we arrived in Costa Rica, we set the goal of assisting MarViva in evaluating and matching suppliers and buyers for inclusion in a prospective responsible fishing supply chain. While our recommendations had the immediate focus of creating and supporting a single restaurant-receiving center relationship in a supply chain between Costa de Pájaros and Monteverde, we hope that our work can be used to establish additional responsible fishing supply chains in the future. Using our work as a guide, MarViva can connect more suppliers and buyers of responsibly-caught fish in Costa de Pájaros and in other fishing regions around Costa Rica.

Additionally, our work can be used by organizations and businesses apart from MarViva to increase the general consumer awareness and knowledge of responsible fishing. For example, restaurants or supermarkets that sell responsibly-caught fish can implement the advertising materials we created to raise customer awareness of the benefits and superior quality of the product.

However, the key to spreading the use of responsible fishing methods may not be simply raising awareness of the issue. According to MarViva, many fishers in Costa de Pájaros understand the purpose and methods of responsible fishing, but lack motivation to switch to the less profitable methods. Thus, to increase the impact of responsible fishing, fishers need to be incentivized to fish responsibly. In other words, lucrative business relationships between receiving centers and corporate buyers are big motivators for fishers to use responsible methods, hence why we evaluated prospective relationships for a new supply chain. In order for the environmental benefits of responsible fishing to become more widespread, not only does awareness need to be raised, but business relationships along the supply chain need to be formed and developed.



Figure 4: A poster to promote responsible fishing among consumers.



# Authorship

Abstract.....	Nathan Stomberg
Executive Summary.....	All
Chapter 1 – Introduction.....	All
Chapter 2 – Costa Rica’s Fishing Industry: From Ocean to Plate.....	All
2.1 The Rising Tide of Unsustainability.....	Nathan Stomberg
2.2 Costa Rica’s Fishing Industry.....	Nathan Stomberg & Androniqi Qifti
2.3 The Issue within Costa Rica’s Fishing Supply Chain.....	Whitney Davis
2.4 Sustainable Marketing Applied to the Supply Chain.....	Nathan Stomberg & April Solon
2.5 MarViva and the Effort to Rectify the Supply Chain.....	Androniqi Qifti & April Solon
Chapter 3 – Methods.....	All
3.1 Objective 1.....	Nathan Stomberg
3.2 Objective 2.....	April Solon
3.3 Objective 3.....	Whitney Davis
3.4 Objective 4.....	Androniqi Qifti
Chapter 4 – Findings.....	All
4.1 Overview of the Supply Chain.....	Nathan Stomberg
4.2 Evaluation of Prospective Receiving Centers.....	April Solon
4.3 Evaluation of Prospective Corporate Buyers.....	Nathan Stomberg
4.4 Matching the Receiving Center and Restaurant.....	Whitney Davis
4.5 Assessing Consumer Awareness and Demand.....	Androniqi Qifti
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# Chapter 1 – Introduction

One of humanity's most important food sources resides in some of the world's most sensitive ecosystems, placing it at great risk. For centuries, humans have relied on fish as an important source of food. It is a good source of protein and other vital nutrients. Fishing is also crucial for many economies, on local, national, and international levels. In many places, it is a source of income for people from coastal communities, and is an internationally exported good.

As the world's population has increased, the demand for fish has increased correspondingly, leading to unsustainable practices in many parts of the world. These unsustainable practices include overfishing and indiscriminate fishing, which captures other fish and marine animals, leading to large amounts of bycatch that takes a toll on the health of the entire ecosystem. Additionally, overfishing causes a strain on the fish stock, facilitating a drastic decrease in fish population over time. The decrease in fish population puts at risk the people who depend on fishing as a source of income or sustenance, and hurts local economies reliant upon fishing. Indeed, this issue is particularly true in the fishing communities of Costa Rica.

The fishing industry comprises a significant portion of the Costa Rican culture and economy. Fishing is an essential aspect of the culture and a major source of income for the country. Since Costa Rica places an emphasis on protecting the environment, there is a considerable effort to fish in a responsible way. The need to fish responsibly is crucial because of the negative impacts overfishing has on the coastal ecosystems and economies. Presently, the country recognizes this need, advocating for the use of responsible fishing which harvests only the targeted species of fish at sustainable amounts. In simpler terms, fishermen are not fishing in excess, thereby leaving a substantial number of young fish to mature and repopulate. Even though some responsible fishing regulations exist in protected Marine Areas for Responsible Fishing (FECOP, 2014), more needs to be done to advocate for responsible fishing techniques throughout the fishing industry.

Fortunately, more environmentally conscious markets and industries are gaining popularity in Costa Rica and elsewhere. Over the last several years, a heightened environmental consciousness among consumers has increased the demand for “green” products. This trend coincided with worldwide efforts by companies and organizations to market and increase awareness about responsible products and initiatives (Iannuzzi, 2012). From this movement rose a variety of organic and eco-friendly goods. And while the idea of “green marketing” has its deepest roots in the United States, similar efforts are gaining traction in Costa Rica. The supermarket chain Automercado, for example, supports the protection of marine life by only stocking fish that are responsibly-caught, and educates consumers by providing relevant information about the fish. Another key player in this movement is our sponsor, the MarViva Foundation.

MarViva has gone to great lengths in support of responsible fishing. The foundation is a non-profit, non-governmental organization with the mission of promoting and preserving the ecosystem by introducing new responsible ways to use the coastal and marine environments. Costa Rica, Panama, and Colombia are only a few of the strategic work areas that MarViva has been focused on during the last few years. The foundation envisions a healthy, biodiverse marine ecosystem that needs to be protected, preserved and “handed down” to the next generation. In MarViva’s efforts to preserve the marine environment, it emphasizes responsible fishing as opposed to sustainable fishing. While sustainable fishing works to ensure that there will at least be fish for future generations, responsible fishing protects the health of the fish and the ecosystem as well. As the organization advocates for responsible fishing, it is working to introduce new responsible markets through various means of promotion and advertisement that aim to guarantee a healthy marine coast.

Despite MarViva’s efforts to introduce responsible fishing markets, the supply chain is not yet well established. Few relationships exist between receiving centers and corporate buyers of responsibly-caught fish. Fueling a lack of demand to drive these relationships is a dearth of awareness on the part of both the restaurants and consumers. Many restaurants do not understand the benefits of responsible fishing well enough to get involved in the industry, and the customers are not familiar enough with the topic to exhibit adequate demand for the product to convince restaurants otherwise. As a result, the fishers miss out on the chance to receive a premium price

for responsibly-caught fish, businesses miss the chance to enter a new market, and consumer awareness is not raised because the product is not marketed. Overall, there is a significant problem in matching the two ends of the supply chain due to the lack of relationship between supply and demand.

To address this problem, we established the goal of analyzing the fishing supply chain based in Costa de Pájaros, Costa Rica, in order to help MarViva create a relationship between a new supplier and a new corporate buyer for a new responsible fishing supply chain.

To attain this goal, we assessed a current responsible fishing supply chain to create a standard by which to evaluate prospective receiving centers and restaurants. We then evaluated the prospective receiving centers and restaurants based on our criteria, determining which two were the best to match in a relationship for a new supply chain. We also learned about the consumers' awareness of, and demand for, responsibly-caught fish, with the objective of using the information to support the new and existing supply chains.

We interviewed prospective receiving centers and corporate buyers, and surveyed consumers to achieve our objectives. We used the data from our interviews to assess the prospective receiving centers and corporate buyers, evaluating their potential for success and cooperation in a new supply chain. Using this evaluation, we paired together the receiving center and the corporate buyer with the most potential. Through a consumer survey, we evaluated the extent to which consumers were aware of, and were willing to buy, responsibly-caught fish. From this survey, we learned the areas in which consumers lacked awareness and used it to create recommendations in support of the supply chain.

In the following chapter, we explain the importance of the fishing industry to Costa Rica, and analyze markets similar to that of responsible fishing to give context to the supply chain. We then describe, in chapter 3, the methods we used to accomplish our project goals. In Chapters 4 and 5 we explain the fishing supply chain and demonstrate our findings and recommendations respectively, after analyzing the information from our interviews. Chapters 4 and 5 include information on the specific restaurants that might potentially form a relationship with the

receiving centers from Costa de Pájaros, as well as consumer awareness of, and demand for, responsibly-caught fish as it pertains to the supply chain.



# Chapter 2 – Costa Rica’s Fishing Industry: From Ocean to Plate

One of the most important food sources in the world is experiencing rapid depletion and facing irreparable damage. Indeed, fish are in danger, and they are heavily relied upon across the planet for both nutrition and livelihood. Fish is the least expensive form of animal protein, and is the main protein source for many underprivileged communities (Finegold, 2012). Additionally, many people around the world depend on fishing as a source of income, and it is a large part of many economies. Unfortunately, this sensitive resource is not being used at a sustainable rate, as 90% of large fish have been eliminated worldwide (Festa et. al., 2008). Looking at the big picture, it is clear that with the current unsustainable practices, the world’s fish population is in great danger.

In this chapter, we provide background information about responsible fishing as it pertains to Costa Rica. We discuss the current problems with overexploitation and unsustainable fishing practices in Costa Rica, and provide insight as to the different factors contributing to these problems. Next, we examine the artisanal fishing supply chain in-depth. We then discuss other sustainable or ‘green’ markets outside of the responsible fishing supply chain in Costa Rica, to examine marketing strategies that succeeded at different levels of the supply chain. Finally, we present the specific problems of the Costa de Pájaros responsible fishing supply chain in order to propose ways to match the supply and demand.

## 2.1 The Rising Tide of Unsustainability

Of the world’s consumption of animal protein in 2010, fish made up almost 17% (FAO, 2014). When considering the wide variety of animals raised for consumption, this portion is in fact quite significant. It is even more significant to people living in heavily populated coastal areas with low protein intake, as they rely on fish more so than the rest of the globe (FAO, 2014).

Overfishing is taking a great toll on this important resource. As of 2011, it was estimated that about 30% of the world’s fisheries were being fished at an unsustainable level that is damaging to the ecosystem. This can be seen in Figure 2.1 below, which shows the percentages of fish

stocks around the world that were under-fished, fully fished, and overfished from 1974 to 2011 (FAO, 2014).

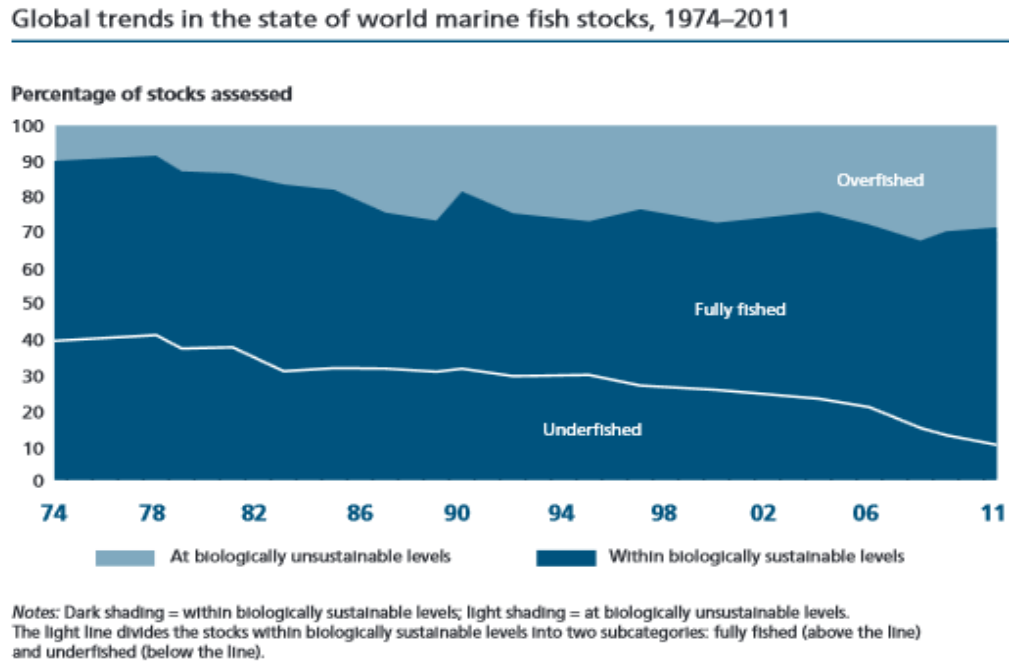


Figure 2.1: This graph shows the proportion of assessed fish stocks that were overfished, fully fished, or underfished from 1974 to 2011 (FAO, 2014).

Of course, marine life is just as limited as any other natural resource, and unfortunately, equally exploited over the years. Indeed, the effects of overfishing can be both widespread and complex. In terms of the environmental impact, overfishing can lead to the unraveling of an entire ecosystem. Specifically in Costa Rica, the overfishing of sea cucumbers was found to have a negative impact on reef ecosystems (Purcell, 2011). Without the filtering and mineralizing properties of the cucumbers, algae and seagrass populations suffer, in turn harming the fish that feed on plant life (Purcell, 2011). In another instance, an examination of the northern Pacific reefs in Costa Rica found that overfishing of herbivorous marine life resulted in a buildup of macro algae, which may be deteriorating the coral reef (Roth, 2015). As shown by both examples, overfishing of one species has a dangerous ripple effect throughout the entire ecosystem.

## **2.2 The Critical Importance of Costa Rica's Fishing Industry**

However serious and far-reaching the environmental impacts of overfishing may be, the effects on the consumer end cannot be overlooked. Many commercial fishers in Costa Rica focus on export, therefore local artisanal fishers are the only suppliers of seafood sold within the country (Herrera-Ulloa, 2011). Since there are no other sources for seafood outside of what is fished locally, added weight is placed upon the shoulders of the artisanal fishing industry to supply the country with fish. This makes protecting the health of the local ecosystem much more important, because it houses the fish caught by artisanal fishers that is sent throughout Costa Rica.

Without a doubt, fishing is critical in Costa Rica. While not the largest industry in the country, fishing is vital to the livelihood of many people living in coastal communities. In fact, fisheries are one of the primary employers for the residents of the coastline, many of whom have low levels of education (Herrera-Ulloa, 2011). Additionally, artisanal fishing serves as the “alternative primary work for marginal sectors” (Herrera-Ulloa, 2011, p. 147). Looking at the demographics of the people involved with the industry, we can conclude that fishing employs a population of people who likely would have difficulty finding work elsewhere. Because of this situation, fishing carries great social significance for Costa Rica.

Beyond the impact it has on the coastal communities, the fishing industry shares a crucial relationship with Costa Rica's biggest market, tourism. This market has steadily increased in years past, indicating the great importance of tourism for the country's economy (Arias, 2015). Costa Rica directly translates to “rich coast,” which reflects the country's plethora of beautiful landscapes. Many Costa Ricans realize that the natural environment is the main feature that attracts tourists. The nation's beauty, along with its ecotourism facilities, has made Costa Rica one of the most popular tourism destinations in Central America. In order to attract as many tourists as possible, numerous community organizations were created with the goal of preserving the ecosystem and maintaining its priceless beauty and diversity. While these organizations were created with the goal of increasing tourism, they also have a positive impact on the fishing industry by promoting clean waters and protection of marine habitats (Mattarita-Cascante, 2010). In addition to the several local organizations that were formed in order to preserve the environment and develop tourism, the Costa Rican Tourism Institute (ICT) has established a

National Plan for Tourism Development that should, in turn, develop the appropriate policies for the use of land in the marine terrestrial zone (Alpizar, 2005).

These initiatives are important because the number of tourists visiting Costa Rica affects local incomes, and therefore, the ability and willingness of local people to spend money on fish, specifically responsibly-caught fish. Fishing responsibly focuses on catching mature and healthy fish. This type of product can be sold at higher prices due to the extra time and effort required to fish responsibly. Although fish is one of the cheapest sources of protein, many impoverished Costa Ricans are still unable to purchase fish twice per week, as recommended by the Pan American Health Organization (Monge-Rojas, 2005). Both the high prices of the responsibly-caught fish and the low incomes of the middle class make people even less willing to spend the extra money for responsibly-caught fish. During the peak of the tourism season, the rate of fish consumption increases dramatically (Monge-Rojas, 2005). The influx of money due to increased tourist spending permits locals to purchase more fish as well. Furthermore, the increase in wages allows fishermen to afford the equipment necessary to fish responsibly (Monge-Rojas, 2005). However, the increase in income will only be available if environmentally-conscious tourists who are willing to buy fish are visiting the country. While Costa Rica usually attracts tourists who are interested in environmentalism and conserving resources, recently the tourist demographic has shifted to people who are more indifferent to and less informed about these matters (Liu, 2008). Therefore, these less environmentally-minded tourists may be apathetic to preserving natural resources, and less willing to purchase products that were fished responsibly. This delicate balance illustrates the importance of strengthening the awareness for responsible fish products among tourists and locals.

### **2.3 The Issue within Costa Rica's Fishing Supply Chain**

In Costa Rica, the government has recognized the dangers of overfishing and has started initiatives for responsible fishing. Responsible fishing entails catching fish using sustainable methods, as well as managing, processing, and marketing the product sustainably (INCOPECA, 2014). The government agency INCOPECA, Costa Rica's Institute of Fishing and Aquaculture, is the key enforcer behind implementing the country's fishing regulations (INCOPECA, 2014). These INCOPECA regulations have been instituted along the Costa Rican fishing supply chain.

The first step in this supply chain is where the fish are caught by fishermen and delivered to receiving centers that weigh and ice the product. From there, the fish are transported to corporate buyers, such as hotels, restaurants, or supermarkets, after which the fish ends up on the plates of consumers.

In the first stage of the supply chain, fishers primarily use gill nets that catch the fish as it swims through. By choosing nets with larger weave, or eyes, small and immature fish can pass through, which is more responsible as these young fish are allowed to grow and reproduce in a healthy manner. This system, however, reduces the number of fish caught and consequently decreases the fishermen's income (I. Morales, personal communication, February 1, 2016). Since fewer fish are caught, the need is greater for the fishermen's wages to reflect the high quality of the catch, which is important because fishermen who are impoverished rely heavily upon the fish they catch as their main source of income and the means by which they support their families.

Another problem that arises in the supply chain occurs in the link between receiving centers and corporate buyers. While many fishermen know how to fish responsibly, they are not motivated enough to deviate from established, traditional fishing methods, and the absence of corporate buyers demanding responsibly-caught fish provides no incentive for them to change (I. Morales, personal communication, February 1, 2016). Yet the issue is not that the demand does not exist, the issue is that the corporate buyers who desire responsibly-caught fish are not partnered with the receiving centers where the fishermen bring their catch. Action needs to be taken to match receiving centers with buyers of responsibly-caught fish in order to encourage responsible fishing and help the marine environment.

## **2.4 Worldwide Sustainable Marketing Applied to the Supply Chain**

In addition to the responsible fishing supply chain in Costa Rica, there is a multitude of markets for sustainable products around the world that have faced similar problems initially, but have used innovative methods to achieve success. Internationally, consumer demand for greener products is on the rise. A Global Green Brands survey in 2010 found that in Brazil, China, and India, over 70% of consumers said they would spend more money on green products than they had in previous years (Iannuzzi, 2011). Among the other countries surveyed, the interest was almost equally strong (Iannuzzi, 2011). Consumers are expressing greater interest in greener products, while passing on ones that are not as environmentally friendly. A Cogent Business and Management study found that electronics perceived as being “more green” were also perceived as having a greater value to consumers (Delafrooz and Goli, 2015). Indeed, the increased push for more sustainable goods can at least in part be attributed to a sense of moral importance that buyers assign them. According to an Edelman public relations survey in 2010, almost three-quarters of American respondents said they would be more willing to spend money on a product that supported a good cause than one that did not (Iannuzzi, 2011). In this case, consumers felt that buying these products would make a difference for the environment and the economy (Iannuzzi, 2011). Overall, the demand for greener products is present; however, companies and organizations need to respond to this demand to be successful.

Not only are sustainable products increasing in demand, they are also becoming more lucrative. In the United States, clambers in southern New Jersey are pursuing a sustainable fishing label in order to capitalize on its rising popularity (Degener, 2016). During recent months, a few other companies have responded to the desires of customers in this fashion. The Canadian Broadcasting Corporation (CBC) reported that the North American branches of both Burger King and Tim Hortons pledged to switch over to cage-free eggs by 2025 (CBC, 2016). These companies’ efforts to join the sustainability movement further reflect the growing consumer demand for such products.

When it comes to making the most of environmental trends, a number of companies have employed creative marketing techniques. In the case of Clorox, they marketed their “Green Works” line of cleaners in a way that made their sustainable product more mainstream (Iannuzzi,

2011). Rather than repeating the overused “saving the environment” pitch, Clorox advertised these organic cleaners with the tagline “doing things that protect me and my family” (Iannuzzi, 2011). Here they were able to successfully market a sustainable brand not by focusing on the environment, but rather on the health of the customer. This idea helped break through to what was considered a niche market at the time.

Transitioning from a niche market to a more mainstream one is a strategic way to target the general public and increase demand for the product. An analysis done on the German organic food market showed that niche markets in the form of organic food stores were targeting too small of a demographic (Latacz-Lohmann, 1997). This was creating a bottleneck effect, preventing the ample supply from reaching consumers. In this case, increased shelf presence of the organic food in supermarkets would be necessary in order to connect the supply and the demand (Latacz-Lohmann, 1997).

In some cases, however, a bigger centralized market does not target the correct demographic and the organic products are not sold in high enough quantities. For example, at the start of the UK organic food movement, the market failed to get off the ground because the supply base was too small and customers were unwilling to pay the increased price for organic food (Latacz-Lohmann, 1997). In this case, it was necessary to create a niche market in the form of organic food stores that target informed people willing to spend the extra money for organic food, rather than selling it in supermarkets next to conventional products. The surge in sales after creating this niche market created more of an incentive for farmers to switch to organic methods, thereby increasing the supply base and enabling lower prices for the organic food (Latacz-Lohmann, 1997). Overall, these examples show that demand for sustainable and organic products does indeed exist, and could be helpful in understanding the Costa Rican market for responsibly-caught fish.

## **2.5 MarViva and the Effort to Rectify the Supply Chain**

In Costa Rica, the MarViva Foundation works to protect the marine ecosystems and promote responsible fishing. Their goal is to guarantee a healthy marine coast and a sustainable fish supply for future generations. In particular, they have done a lot of work in the community of Costa de Pájaros, a village in the Gulf of Nicoya on the Pacific coast of Costa Rica, shown on the map in Figure 2.5. Not only do 95% of Costa Rica's artisanal fishers work on the Pacific coast, but the largest concentration of this fleet is also in the Gulf of Nicoya (Herrera-Ulloa, 2011). Because this large population of fishers greatly affects the marine ecosystem, Costa de Pájaros has recently had to make advances to increase responsible fishing. Many fishermen are already using, or are switching to, more selective fishing methods. These include methods such as hand-lines, and gillnets with holes several inches larger than the legal minimum. A diagram of these two methods is shown below in Figure 2.3. In turn, the more selective techniques limit the catching of immature fish (I. Morales, personal communication, February 1, 2016). When the fishermen first switch to fishing responsibly, their profit initially decreases because they are catching fewer fish. Over time, fishing responsibly is beneficial to the fishermen's income because it produces higher quality fish. However, there are currently not enough relationships between corporate buyers demanding responsibly-caught fish and receiving centers that can supply it (I. Morales, personal communication, February 1, 2016). Without the supply chain relationships to drive the demand for responsibly-caught fish, the incentive for fishermen to use responsible fishing methods is diminished. In order to incentivize the responsible fishing efforts, more corporate buyers need to be matched with receiving centers in the responsible-fishing supply chain.





Figure 2.2: This map of Costa Rica shows the location of Costa de Pájaros.



Figure 2.3: These figures show various responsible fishing methods.

In the past, MarViva has worked with Costa de Pájaros to create and manage the responsible fishing supply chain. The foundation has recognized the difference between responsible and sustainable practices. Sustainable fishing focuses on ensuring the presence of fish in the oceans for future generations. On the other hand, responsible fishing takes into account the size and health of the fish, as well as the overall health of the entire ecosystem, by using methods that harvest only mature fish of certain species in controlled amounts. In this way, responsible fishing goes beyond sustainable fishing, improving the quality of the fishers' catch instead of just

prolonging it. MarViva has collaborated with the community in order to introduce new regulations that promote and ensure responsible fishing in Costa de Pájaros. For example, they have implemented the Environmental Responsibility Standard for Marine Fish Commercialization, which is a standard that businesses follow to promote responsible fishing (Responsible Markets, 2014). The standard entails that businesses use a traceability system and only buy from responsible fishermen, thereby incentivizing them with the reliable demand to use responsible methods. The organization has also had a vital role in introducing new sustainable markets through promoting and advertising responsibly-caught fish. Moreover, MarViva closely interacts with fishermen, receiving centers, and corporate buyers along the supply chain in order to create more business relationships in the responsible fishing supply chain.

In an effort to form these relationships in a new supply chain, MarViva has partnered with the Corredor Biológico Pájaro Campana, a biological corridor joining Costa de Pájaros with Monteverde, a tourist destination in the mountains. The purpose of the biological corridor is to geographically connect the two different ecosystems with the purpose of maintaining their biodiversity, and the environmental benefits of responsible fishing support the cause of the corridor.

Despite all of these efforts to promote responsible fishing, more needs to be done to match the supply and demand for responsibly-caught fish. For our project, we analyzed the fishing supply chain based in Costa de Pájaros, Costa Rica, in order to help MarViva create a relationship between a new supplier and a new corporate buyer for a new responsible fishing supply chain. We then established a criteria based on an established supply chain relationship that was used to evaluate prospective receiving centers and restaurants to match in the new chain. Once evaluated, we recommended the best receiving center and restaurant to pair together in the new responsible fishing supply chain, incentivizing the fishermen at the new receiving center to use responsible methods. Lastly, we surveyed consumers in the area to determine their awareness of, and demand for, responsibly-caught fish in order to make recommendations on how to support the new and established supply chains. In the following chapter, we explain the methods we used to accomplish our objectives.

## Chapter 3 – Methods

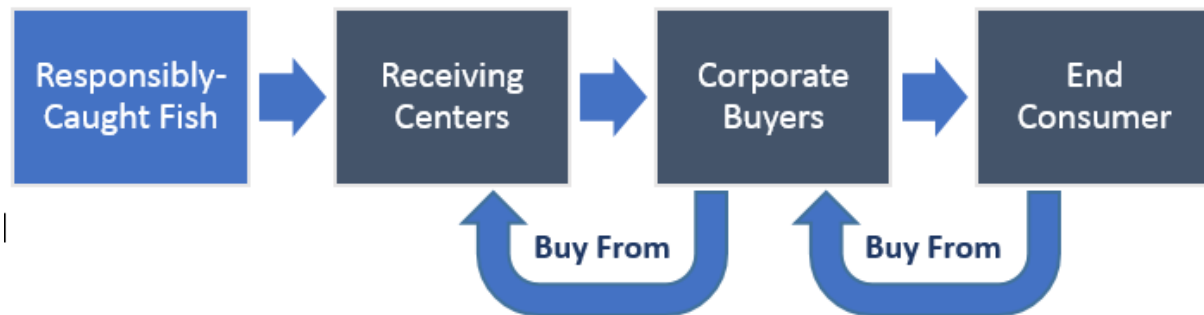
The goal of this project was to analyze the fishing supply chain based in Costa de Pájaros, Costa Rica, in order to help MarViva create a relationship between a new supplier and a new corporate buyer for a new responsible fishing supply chain. In order to accomplish this goal, we set the following objectives:

- 1. Determine criteria to assess prospective receiving centers and corporate buyers in a new supply chain, based on the established supply chain and MarViva's expectations of the new chain**
- 2. Assess the potential of prospective receiving centers in Costa de Pájaros to be matched with a corporate buyer in a new supply chain, using the criteria based on the model receiving center**
- 3. Assess the potential of prospective corporate buyers of responsibly-caught fish to be matched with a receiving center in a new supply chain, using the criteria based on the model corporate buyer**
- 4. Assess the awareness of, and demand for, responsibly-caught fish among end consumers to support the new supply chain**

To achieve our objectives, we carried out action research that consisted of interviews, observations, and surveys. We conducted interviews and took observations of both the suppliers and corporate buyers. 'Supplier' describes the receiving centers who supply the fish, and the term 'corporate buyers' describes any restaurants or businesses that buy fish from a receiving center. We also conducted surveys with consumers of responsibly-caught fish. In analyzing our data, we used our observations from a model receiving center and restaurant to develop standards by which the prospective receiving centers and restaurants interviewed could be judged. Additionally, we analyzed the consumer survey responses by looking at overall trends in the data.

The logic of our objectives follows the process of the fishing supply chain. After the fishers get their catch, they bring it to receiving centers, where the fish is ideally inspected for quality. The

receiving centers then sell the fish caught to corporate buyers, which include businesses such as restaurants, hotels, and supermarkets. From the corporate buyers, consumers purchase the fish to be eaten. Figure 3.1 below displays this process.



*Figure 3.1: This flow chart describes the responsible fishing supply chain.*

We specifically dealt with two distinct responsible-fishing supply chains: an established chain and the prospective chain to be set up by the relationship created in our recommendation. A map of these two chains can be seen later in Figure 4.1 in Chapter 4. The established chain consisted of the receiving center Cama Pez de la Costa and the restaurant Isla Coco's Bar & Grill, both of which have worked with MarViva for three years. During this time, Cama Pez has only distributed responsibly-caught fish, and the fish served at Isla Coco's is only responsibly-caught as well. This relationship served as the standard against which the prospective receiving centers and restaurants were evaluated. The criteria for evaluating receiving centers and restaurants can be found in Objective 1. The prospective supply chain will comprise businesses in the Corridor Biológico Pájaro Campana, a biological corridor that geographically connects receiving centers in Costa de Pájaros to restaurants in Monteverde. The purpose of the biological corridor is to geographically connect two different ecosystems with the purpose of maintaining biodiversity, and the environmental benefits of responsible fishing support this purpose. Addressing the final part of the supply chain, we surveyed consumers at Isla Coco's Bar & Grill to gauge their awareness of responsible fishing and used it to support both the established and the new responsible fishing supply chains.

### **3.1 Objective 1: Determine criteria to assess prospective receiving centers and corporate buyers in a new supply chain, based on the established supply chain and MarViva's expectations of the new chain**

Our first objective was to develop criteria to assess the prospective receiving centers and corporate buyers for the new supply chain. These criteria were developed by examining the receiving center and restaurant in the successful, established supply chain, and also using MarViva's expectations of a responsible fishing supply chain. These criteria were used to evaluate each receiving center's and restaurant's potential to form a successful business relationship in a new supply chain, similar to the relationship in the established supply chain.

#### **3.1.1 Criteria for Prospective Receiving Centers**

We conducted a semi-structured interview with the owner of Cama Pez de la Costa, Don Manrique Medrano, to help determine the criteria for assessing prospective receiving centers. The interview was set up by our sponsor, Irene Morales of MarViva. Don Medrano also validated our interview questions to ensure none were too vague or sensitive when interviewing the prospective receiving centers. Using information gained from the interview and MarViva's expectations of receiving centers involved with responsible fishing, we developed four criteria. The prospective receiving centers would be given a score of 1 to 3 in each of the four criteria. A score of 1 meant the receiving center fell short of meeting the criterion, a score of 2 meant it met the criterion, and a score of 3 meant it exceeded the criterion. The total scores of all four categories for each receiving center would then be tallied and compared, with the more qualified receiving center getting the higher score. The four criteria are discussed in detail in Chapter 4.

#### **3.1.2 Criteria for Prospective Corporate Buyers**

We conducted a semi-structured interview with the owner of Isla Coco's Bar & Grill, Don Mario Zamora, to help determine the criteria for assessing prospective corporate buyers. The interview was set up by our sponsor at MarViva. This interview focused on qualitative information about the owner, including his motivations for selling responsibly-caught fish, how he runs his business, and how he conducts his relationship with the Cama Pez receiving center. Using the information gained from the interview and MarViva's expectations of corporate buyers of

responsibly-caught fish, we developed four criteria, which were different from the four used to evaluate receiving centers. The prospective corporate buyers would be given a score of 1 to 3 in each of the four criteria. A score of 1 meant the corporate buyer fell short of meeting the criterion, a score of 2 meant it met the criterion, and a score of 3 meant it exceeded the criterion. The total scores of all four categories for each corporate buyer would then be tallied and compared, with the more qualified buyers getting the higher scores. The four corporate buyer criteria are also discussed in detail in Chapter 4.

### **3.2 Objective 2: Assess the potential of prospective receiving centers in Costa de Pájaros to be matched with a corporate buyer in a new supply chain, using the criteria based on the model receiving center**

Our second objective was to assess the receiving centers in Costa de Pájaros in terms of how the owners run their businesses, the steps taken during their receiving processes, and their attitudes toward responsible fishing. In order to recommend which supplier to match with a corporate buyer in the new responsible-fishing supply chain, we gauged the potential of a receiving center to succeed in a supply chain relationship based on the criteria established in Section 3.1.1.

We conducted semi-structured interviews with owners of two receiving centers in Costa de Pájaros. The two prospective receiving centers up for evaluation were Pescadería las Palmas, owned by Don Sabino Trejos, and Pez y Mar, owned by Don Julio Gomez. The interviews with both receiving centers were set up by our sponsor, Irene Morales of MarViva, after she screened six prospective receiving centers in Costa de Pájaros for willingness to host an interview. The information collected from the interviews included the species and volumes of fish received on a weekly basis, the methods used to catch the fish, and an overview of the receiving process revealing how the fish is handled from the time it arrives to the time it is sold. We also observed the owners' attitudes towards responsible fishing and their motives for joining the new responsible fishing supply chain. The questions asked during these interviews can be found in Appendix A. After the interviews, we analyzed the data collected to score the two receiving centers in each of the four categories. We also qualitatively analyzed the capacity of each receiver to cooperate with MarViva in implementing responsible fishing practices, as well as the potential for each to form a strong business relationship with the prospective restaurant.

We decided to use semi-structured interviews for several reasons, including because they are more flexible and open-ended compared to a structured survey. They allow for clarification of questions we ask and the answers we receive, and allow the conversation to be tailored to the knowledge of the interviewee (Barriball, 1994). This was an effective tool for interviewing the owners of receiving centers because different owners at different receiving centers had contrasting perceptions of responsible fishing. It also was helpful to be able to further explain or clarify that were misunderstood due to the language barrier. Lastly, face-to-face interviews are effective tools to make sure all of our questions are answered. Surveys that are given indirectly introduce the problem of non-respondents, where people either fail to respond entirely or do not answer every question (Salant, 1994). By interviewing the owners in person, we ensured that all of our questions were answered.

### **3.3 Objective 3: Assess the potential of prospective corporate buyers of responsibly-caught fish to be matched with a receiving center in a new supply chain, using the criteria based on the model corporate buyer**

Our third objective was to assess the prospective corporate buyers in Monteverde of the responsibly-caught fish from Costa de Pájaros, in terms of what the owners looked for in a supplier of fish, factors taken into account when buying fish, and their attitudes toward responsible fishing. In order to recommend which corporate buyer to match with a receiving center in the new responsible-fishing supply chain, we gauged the potential of a restaurant to succeed in a supply chain relationship using the criteria we created in Objective 1.

We conducted semi-structured interviews with nine restaurants in Monteverde. The interviews in Monteverde were set up by MarViva through their partnership with the Centro Científico Tropical (CCT), which works with the biological corridor and served as a contact for the restaurants in Monteverde. The restaurants we interviewed in Monteverde were Morphos Restaurant, Musashi, Restaurant Amy's, Restaurante de Lucia, Restaurante d'Sofia, Restaurante Don Luis, Restaurante Sabor Tico, Tramonti Pizzeria y Restaurante, and Tree House Restaurant and Bar.

The interviews were conducted over the course of two days. The interviews helped us understand the extent to which each prospective buyer was able to absorb fish and their interest in entering the responsibly-caught fishing market. Data collected from the interviews included species of fish bought, volumes of fish needed, and flexibility of their menu. With this information, we were able to assess the restaurants based on the criteria in Section 3.1.2, and could inform MarViva which prospective buyers to incorporate into the new responsible fishing supply chain. The questions asked to prospective buyers in Monteverde can be found in Appendix B.

We chose to use semi-structured interviews for the corporate buyers for similar reasons to the receiving center interviews. A semi-structured interview provides a balance between structure and flexibility. We were able to collect the information on the predetermined questions, but were not limited to solely asking a specific set of questions. We also asked for clarification and elaboration as needed to fully understand their willingness to sell responsibly-caught fish (Bailey, 1978).

### **3.4 Objective 4: Assess the awareness of, and demand for, responsibly-caught fish among end consumers to support the new supply chain**

Our fourth objective was to assess consumers' awareness and demand for responsibly-caught fish so that we could use the information gained to make recommendations in support of the rest of the supply chain. Understanding the consumers was important because they drive the corporate demand for responsibly-caught fish, which drives the demand for the same fish from receiving centers, in turn incentivizing receivers and fishers to use responsible methods. Thus, increasing the consumer demand would greatly support the entire supply chain. To achieve this objective, we surveyed consumers at Isla Coco's Bar & Grill in Puntarenas. This restaurant is part of the established supply chain and sells responsibly-caught fish from the Cama Pez de la Costa receiving center.

We administered structured surveys during Saturday lunch and dinner and Sunday lunch at Isla Coco's. Our sponsor, Irene Morales, set up these surveys because of the restaurant's existing



relationship with MarViva. Customers of this restaurant were ideal candidates for our survey because they are currently purchasing and consuming responsibly-caught fish. We chose to conduct the surveys on the weekend because more people visit the restaurant then. In addition, conducting surveys during both lunch and dinner times gave us the opportunity to target more demographics. These demographics included more single adults who go out to eat later on Saturday, and more families that might eat on Sunday. The overarching demographic across both groups of people was that they had the means to buy responsibly-caught fish, which made them the best groups to interview. Surveying consumers who could never buy, or would rarely buy, responsibly-caught fish would not serve our purposes.

To determine the number of surveys to administer, we did a sample size calculation for a population of 250 people, which was the average number of customers Isla Coco's receives during the weekend. We used a 95% confidence level and a confidence interval of 15 to get a sample size of 37 consumers to survey. In other words, we could be 95% sure that our results were accurate within 15%. We exceeded our confidence level by surveying a total of 45 consumers over the course of three mealtimes.

The surveys gathered data regarding the fish buying habits of the consumers, including how often they eat fish, where they buy fish, what species of fish they eat, and the most important qualities of the fish they buy. The data also included whether or not the consumers were informed about the origin of the fish they bought as well as what information consumers want to know most about responsibly-caught fish. Finally, the survey also collected data on what consumers knew about responsible fishing, if they would pay more for responsibly-caught fish, and how much more they would pay for responsibly-caught fish. We used this data to draw conclusions about consumer demand and awareness regarding responsibly-caught fish to support the established and prospective supply chains. The questions asked in this survey can be found in Appendix C.

We used a structured survey because it would collect consistent answers from the people surveyed, as the structured nature of the questions allowed little room for interpretation. By constructing questions to gather the most relevant information, we could in turn reach valid and

realistic conclusions (Bailey, 1978). Overall, the methods we used helped us achieve our four objectives, giving us the results discussed in the following chapter.

# Chapter 4 – Results

## 4.1 Overview of the Supply Chain

The established responsible-fishing supply chain that served as our standard consists of the relationship between the Cama Pez de la Costa receiving center, and the corporate buyer Isla Coco's Bar & Grill. They have been working together and with MarViva for 3 years in distributing and selling only responsibly-caught fish. The established supply chain begins with the fishermen who work for Cama Pez de la Costa using responsible fishing methods to catch fish in the Gulf of Nicoya. The fishers bring the responsibly-caught fish to Cama Pez de la Costa, where the fish is inspected visually to ensure it is fit for consumption and stored on ice for freshness. Once received and inspected, the responsibly-caught fish is driven 36 miles away to Isla Coco's Bar & Grill, which only serves responsibly-caught fish. Isla Coco's is the only major corporate buyer that purchases fish from Cama Pez. Finally, the fish is served to the consumers at Isla Coco's restaurant. We examined this successful, established supply chain to determine the ideal characteristics to look for in prospective parts of a new one.

In an effort to create a new responsible fishing supply chain, MarViva identified the Corredor Biológico Pájaro Campana as the region of interest. The Corredor Biológico Pájaro Campana is a biological corridor that geographically connects Costa de Pájaros to Monteverde, a tourist destination in the mountains. Currently, a conventional fishing supply chain exists where receiving centers in Costa de Pájaros supply businesses in Monteverde with fish. MarViva chose this corridor because of its recent partnership with the Centro Científico Tropical (CCT), an organization advocating for environmental protection among businesses in Monteverde. The introduction of a responsible-fishing supply chain in the biological corridor would aid the CCT's efforts in environmental protection. A map of both the established and prospective supply chains can be seen in Figure 4.1 below.



Figure 4.1: This map illustrates routes of the established and prospective responsible fishing supply chains.

While receiving centers that distribute responsibly-caught fish, such as Cama Pez de la Costa, already exist in Costa de Pájaros, they have established relationships with a balance of supply and demand. Adding buyers from Monteverde would not make sense, because it would only disrupt this balance, leaving the new corporate buyer without enough supply. For this reason, we evaluated receiving centers and restaurants as prospective parts of a new responsible fishing supply chain, using the established supply chain as a model. Our evaluation began with an examination of receiving centers.

## 4.2 Evaluation of Prospective Receiving Centers

### 4.2.1 Criteria for Prospective Receiving Centers

Based on MarViva's requirements and the standards set by Cama Pez, we determined that the four main categories with which to judge the prospective receiving centers were overall hygiene, transparency of receiving process, appreciation of stable business relationships, and attitude

towards responsible fishing. The first category, **overall hygiene**, was based upon MarViva's standards for hygiene, which require that the fish is kept on ice to guarantee freshness, is handled in a contained environment, and is eviscerated immediately after it is caught so as not to contaminate the facilities. Cama Pez de la Costa gives us a clear example of the level of cleanliness to look for in prospective suppliers. The second category, **transparency of receiving process**, was based on MarViva's need to implement a traceability system in order to collect and track the data about aspects of the responsibly-caught fish. Cama Pez was organized in their record keeping and extremely open and honest about their receiving process. The third category, **valuing stability in business relationships**, encompasses the ability to have an established relationship with a corporate buyer and to guarantee a consistent supply of fish to this buyer. Cama Pez has embodied this dependability and trustworthiness in their partnership with Isla Coco's over the past three years. For the final category, **attitude towards responsible fishing**, we evaluated the receiving centers' willingness to enter the prospective responsible fishing supply chain and their motives for entering it. We looked to Cama Pez de la Costa as the model because of their great passion to produce a high quality product and help the environment through responsible fishing.

Within each category, we evaluated the two receiving centers and gave them a score of 1 to 3 in each of the four criteria. A score of 1 meant the receiving center fell short of meeting the criterion, a score of 2 meant it met the criterion, and a score of 3 meant it exceeded the criterion. The total scores of all four categories for each receiving center were then tallied and compared, with the more qualified receiving center getting the higher score. Each of these criteria will be discussed in detail in the following sections.

Table 4.1 displays the quantitative data collected from the receiving center interviews that is most pertinent to this evaluation in addition to the qualitative data discussed in the sections below. The scores for both receiving centers in each of the four categories can be seen in Table 4.2.

Table 4.1: This table shows the raw data for the established receiving center, Cama Pez de la Costa (highlighted in blue), and prospective receiving centers, Pescadería las Palmas and Pez y Mar. These data were used to when evaluating the receiving centers against our four criteria.

<b>Receiving Center Name</b>	<b>Cama Pez de la Costa (Established)</b>	<b>Pescadería las Palmas (Prospective)</b>	<b>Pez y Mar (Prospective)</b>
Owned by	Don Manrique Medrano	Don Sabino Trejos	Don Julio Gomez
Is fish received on ice?	Yes	Sometimes	Yes
Is the fish received eviscerated?	Yes	Yes	No
Methods used by fishermen	Handline, Gillnet, Longline	Handline and Gillnet	Handline, Gillnet, Longline, Cast Net, Beach Seine Net
Net size used	3.5 inches	3.5 inches	3.5 inches
Hook type used	6 and 7	7	6 and 7
Number of established fishermen	26	25	5
Number of stable clients	6	4	5

#### 4.2.2 Overall Hygiene

Cama Pez de la Costa, the model receiving center, enforces high standards of hygiene of which both prospective receiving centers fell short to certain degrees. Pescadería las Palmas’ buildings were open to the outdoors, and we observed minimal sanitation of their facilities. Additionally, they reported that not all of their fish is on ice when it is received. We gave Pescadería las Palmas a 1 out of 3 for hygiene because it fell below the standard set by Cama Pez. Pez y Mar had similar problems with the sanitation of their facilities. However, a serious red flag was that the fish they receive is not eviscerated. This is very unhygienic because the presence of fish innards introduces bacteria into the facilities, causing a contamination source. As a result, we also evaluated Pez y Mar as a 1 out of 3 for hygiene because their problems placed them well below Cama Pez’s standard of cleanliness.

### **4.2.3 Transparency of Receiving Process**

At Pescadería las Palmas, we observed a lack of record keeping about the fish that is received; however, they showed the desirable level of openness about their process. We were able to easily collect necessary data about their receiving process as well as the methods used by their fishermen. Because they have the potential to easily improve their record keeping to implement the traceability system, they met the standard of the category and received a 2 out of 3. At Pez y Mar, we noticed a similar lack of record keeping. Additionally, the owner, Don Julio, was very guarded when describing his receiving process, and tailored his answers to our expectations by referencing MarViva's brochure on responsible fishing guidelines. When asked technical questions about his fishermen's methods, he was not able to answer without consulting a brochure, which led us to believe he was trying to conceal less than responsible methods. While methods can be easily changed, honesty and integrity are qualities that are more important to the success of a business relationship. For these reasons, Pez y Mar fell below the standard and received a 1 out of 3 for transparency because the owner's guarded nature would make it challenging for MarViva or the prospective restaurant to work with him.

### **4.2.4 Valuing Stability in Business Relationships**

We found that Pescadería las Palmas placed value on their business relationships. As seen in Table 4.1, they have 4 stable clients and 25 regularly returning fishermen, representing an ability to establish commitment and trust in their relationships. Additionally, Don Sabino spoke about how he is loyal to his established clients and stated that he prioritizes satisfying his business deals with them over how much money he can get from other people. Thus, we ranked Pescadería las Palmas as a 2 out of 3. Don Julio of Pez y Mar revealed less about valuing stable relationships, stating that he does not have contracts with anyone and that he will sell to whomever offers the best price. Based on his lack of both loyalty and established relationships with clients and fishermen, as seen in Table 4.1, we rated Pez y Mar as a 1 out of 3 for this category.

### **4.2.5 Attitude Towards Responsible Fishing**

At Pescadería las Palmas, we observed a strong commitment to supplying a high quality product to the end consumer. Similarly, Don Sabino displayed a high level of interest in distributing responsibly-caught fish due to its superior quality. We gave Pescadería las Palmas a 3 out of 3

due to their desired attitude and enthusiasm towards responsible fishing. Although Don Julio of Pez y Mar showed a high interest in working with MarViva, he told us he was motivated to enter the prospective supply chain by the potential financial benefits of selling a product with an increased price. We observed that he prioritized price over the quality of the product, and displayed a lack of concern about the environmental benefits responsible fishing entails. His only motivation to distribute responsibly-caught fish was the perceived profit increase he would receive. For these reasons, we ranked Pez y Mar as a 1 out of 3 for attitude towards responsible fishing.

#### 4.2.6 The Most Qualified Receiving Center

In order to identify the most qualified receiving center, we took into consideration the four criteria previously explained. The following table displays the score given to each potential receiving center.

Table 4.2: This table shows the scores given to the potential receiving centers for each criterion.

<b>Receiving Center</b>	<b>Pescadería las Palmas (Don Sabino)</b>	<b>Pez y Mar (Don Julio)</b>
Overall Hygiene	1	1
Transparency of Receiving Process	2	1
Valuing Stable Business Relationships	2	1
Attitude Towards Responsible Fishing	3	1
<b>Total Score (12 pts possible)</b>	<b>7</b>	<b>4</b>

Overall, transparency of process, reliability of supply and enthusiasm for responsible fishing are the key components that distinguished Pescadería de las Palmas from Pez y Mar. Pescadería las Palmas received a total score of 30, while Pez y Mar only scored 16 out of the possible 40 points. Thus, it was evident that Pescadería las Palmas had the most potential to enter the prospective responsible fishing supply chain.



## 4.3 Evaluation of Prospective Corporate Buyers

### 4.3.1 Criteria for Prospective Corporate Buyers

When determining our four criteria, we considered both the model restaurant and MarViva's expectations of corporate buyers. First, MarViva **prioritizes the quality of the product**, displayed by Don Mario's desire to serve fish of utmost quality. Second, our sponsor Irene Morales explained that fishing responsibly includes not fishing certain species of fish during their peak of reproduction. Since these species are not guaranteed to be available year-round, restaurants truly interested in supporting responsible fishing must be able to **incorporate alternative species** on their menu during these times. Third, Don Mario **values his stable business relationship** with Cama Pez, one of the reasons their partnership has been so successful. Lastly, Ms. Morales explicitly underlined the great importance of the prospective restaurants **attitude towards responsible fishing**, which is embodied by Don Mario in his sale of responsibly-caught fish in his restaurant and with his community outreach initiatives to support responsible fishing in the community of Puntarenas.

Within each category, the prospective restaurants were given a score of 1 to 3. A score of 1 meant the corporate buyer fell short of meeting the criterion, a score of 2 meant it met the criterion, and a score of 3 meant it exceeded the criterion. The total scores of all four categories for each were then tallied and compared, with the more qualified restaurants getting the higher scores. Each of these four criteria will be discussed in detail in the following sections.

Table 4.3 below displays the raw data collected from the restaurant interviews that was most pertinent to the evaluation with regards to the four previously mentioned criteria. The scores for all nine restaurants in each of the four criteria can be seen in Table 4.4.

Table 4.3: This table shows a direct comparison between the established restaurant, Isla Coco's (highlighted in blue), and the nine prospective restaurants.

Restaurant Name	Isla Coco's Bar & Grill	Morphos Restaurant	Musashi	Restaurante Amy's	Restaurante de Lucia	Restaurante d'Sofia	Restaurante Don Luis	Restaurante Sabor Tico	Tramonti Pizzeria y Restaurante	Tree House Restaurant y Café
Factors considered when purchasing and serving fish	Quality, Sustainability	Price	Quality	Quality	Quality	Quality, Sustainability	Quality	Price	Quality, Trust, Price	Quality, Price, Freshness
Are they willing to add alternative species to the menu	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
From whom do they currently buy their fish	Manrique Mediono	Luis Carlos Rodriguez	Jose Angel	Miguel Jilarango	Miguel Jilarango	Marvin Trejos	Municipal Market in Puntarenas	A Retailer in Monteverde	Miguel Jilarango	Municipal Market in Puntarenas

### 4.3.2 Prioritizing a Quality Product

During our interviews of prospective restaurants, we found that seven of the nine restaurants interviewed thought quality was the most important factor to consider when buying fish for their restaurant. Restaurante d'Sofia, Restaurante de Lucia, and Tree House Restaurant distinguished themselves in this category; we observed that each placed great importance on serving a quality product to their customers and prioritized it over price. For these reasons, they received a score of 3. Interestingly, while the Musashi restaurant answered that quality was a priority, in a later question they indicated that their product was delivered “*por encomienda,*” or by public bus. According to our sponsor Irene Morales, public transportation is not a good way to keep fish fresh, thus showing that Musashi does not completely prioritize quality to the extent that they indicated. Additionally, as seen in Table 4.3, Morphos Restaurant and Restaurante Sabor Tico valued the price of fish over its quality, indicating that they would sacrifice the quality of the product for a lower price. Thus, we gave these three restaurants a score of 1 for this category. The remaining three restaurants displayed an adequate concern for the quality of their fish and were given a score of 2.

### 4.3.3 Willingness to Incorporate Alternative Species

As seen in Table 4.3, Restaurante Don Luis, Restaurante Sabor Tico, Tramonti Pizzeria y Restaurante, and Tree House Restaurant y Café were not willing to be flexible with the types of fish on their menu, thus receiving a score of 1. The other five restaurants said that they could be flexible with their menu. Restaurante d'Sofia stood out for their particular enthusiasm in this

regard. The owner reported that they would be excited to sell different species of fish to allow fish populations to replenish, which is a key aspect of selling responsibly-caught fish. The other four restaurants that showed willingness to change their menu received a score of 2, while Restaurante d'Sofia received a score of 3, as seen later in Table 4.4.

#### **4.3.4 Valuing Stability in Business Relationships**

We found that seven of the nine restaurants interviewed had a stable relationship with a supplier from whom they bought fish on a regular basis. Therefore, they would likely exhibit the same stability in a business relationship with a prospective receiving center, and thus received a score of 2 for this category. Tree House Restaurant and Restaurante Sabor Tico did not have an established supplier, but rather bought fish from the municipal market as needed, as seen in Table 4.3. Due to this, they show less potential to have a successful relationship with one of the prospective receiving centers and received a score of 1.

#### **4.3.5 Attitude Towards Responsible Fishing**

When asked explicitly if they would be interested in selling responsibly-caught fish, each restaurant said yes. However, their answers to other questions and general attitudes during the interview made it clear which candidates were more interested than others. We found that the owner of Restaurante d'Sofia again distinguished himself with his knowledge and appreciation of how responsible fishing positively impacts both the quality of the product and the environment. He expressed great interest in incorporating responsibly-caught fish, including alternative species, on his menu as a way to help preserve the marine ecosystem, and thus received a 3 in this category. Morphos Restaurant, Musashi, Restaurante Amy's, and Restaurante de Lucia all were interested in responsibly-caught fish, but showed some reservation about selling it. For example, as previously discussed, Morphos Restaurant prioritized price when purchasing fish, and was concerned about the potential price of responsibly-caught fish. The owner of Restaurante de Lucia was interested in the environmental benefits of responsibly-caught fish, but was unsure if he would be capable of introducing it to his menu in the near future. Musashi and Restaurante Amy's both had similar reservations about the price and the likelihood of switching to responsibly-caught fish sooner rather than later. For these reasons, we gave these four restaurants a score of 2. The remaining four restaurants were all unwilling to include alternative species on their menu and did not show an adequate level of interest to

guarantee they would be committed to selling responsibly-caught fish if included in the new supply chain. Therefore, we gave them a score of 1.

#### 4.3.6 The Most Qualified Restaurants

Table 4.4 below displays the scores given to the prospective restaurants for each criterion.

Table 4.4: This table shows the scores given to potential restaurants for each criterion.

<b>Restaurant Name</b>	<i>Morphos Restaurant</i>	<i>Musashi</i>	<i>Restaurante Amy's</i>	<i>Restaurante de Lucia</i>	<i>Restaurante d'Sofia</i>	<i>Restaurante Don Luis</i>	<i>Tramonti Sabor Tico</i>	<i>Restaurante Pizzeria y</i>	<i>Tree House Restaurante y Café</i>
Prioritizing Product Quality	1	1	2	3	3	2	1	2	3
Willingness to Incorporate Alternative Species	2	2	2	2	3	1	1	1	1
Valuing Stability in Business Relationships	2	2	2	2	2	2	1	2	1
Attitude Towards Responsibly Caught Fish	2	2	2	2	3	1	1	1	1
<b>Total Score (12 pts possible)</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>11</b>	<b>6</b>	<b>4</b>	<b>6</b>	<b>6</b>

Restaurant d'Sofia was differentiated from the eight other restaurants by their value of a quality product, willingness to incorporate alternative species, appreciation of stable business relationships, and overall positive attitude towards responsibly-caught fish. When evaluating the data, it was clear that Restaurant d'Sofia was the most qualified restaurant candidate. Once this was determined, we assessed the degree to which the potential relationship between the selected receiving center and restaurant would be successful.

## **4.4 Matching the Receiving Center and Restaurant**

Since the prospective restaurant and receiving center need to be a good match as well as be strong candidates on their own, we took into consideration what receiving centers needed from restaurants and what the restaurants expected from their supplier. The potential receiving centers explained how they need a client who can form a strong relationship and commit to absorbing their fish supply. Additionally, when buying fish from the receiving centers, quality of the product and reliability in the supply are the two most important factors that Monteverde businesses have in mind. Restaurante d’Sofia showed that they value established relationships and are willing to consistently absorb the supply of fish from the prospective receiving center. Additionally, Pescadería las Palmas demonstrated that they value loyalty and established relationships when dealing with clients and are passionate about providing a high quality product. For these reasons, Pescadería las Palmas and Restaurante d’Sofia have an outstanding potential to be partners in the new responsible fishing supply chain.

While having a good match for a receiving center and restaurant in the new supply chain is important, it is also important to understand the end consumers who will be buying from this chain, when all is said and done. The end consumers drive the demand for responsibly-caught fish from restaurants, which drives the restaurants’ demand for responsibly-caught fish from receiving centers. In order to meet the demand, fishers and receiving centers are incentivized to use responsible fishing methods. Thus, the end consumer impacts the entire supply chain, and understanding the state of consumer awareness and demand can help support the chain.

## **4.5 Assessing Consumer Awareness and Demand**

To evaluate the consumers’ awareness of responsibly-caught fish we surveyed the consumers of Isla Coco’s, the restaurant in the established responsible fishing supply chain. Since the consumers impact the entire responsible fishing supply chain, we used the information about their awareness and demand to determine ways to better support both the established and prospective supply chains.

### **4.5.1 Consumer Interest in Responsibly-Caught Fish**

During our consumer surveys, we found that customers with only a mild familiarity with responsible fishing still showed interest in buying responsibly-caught fish. In fact, we found that

they were even willing to pay more for it. From the survey, almost 90% of consumers said they would pay at least 5% more for responsibly-caught fish, as shown in Figure 4.2 below.

Interestingly, these consumers were unaware that they were buying responsibly-caught fish, but were still willing to pay more for the responsibly-caught product, likely because of its increased quality over conventionally-caught fish. In the case of the established chain, it is clear that consumer demand exists for responsibly-caught fish, and that customers are willing to pay more for it.

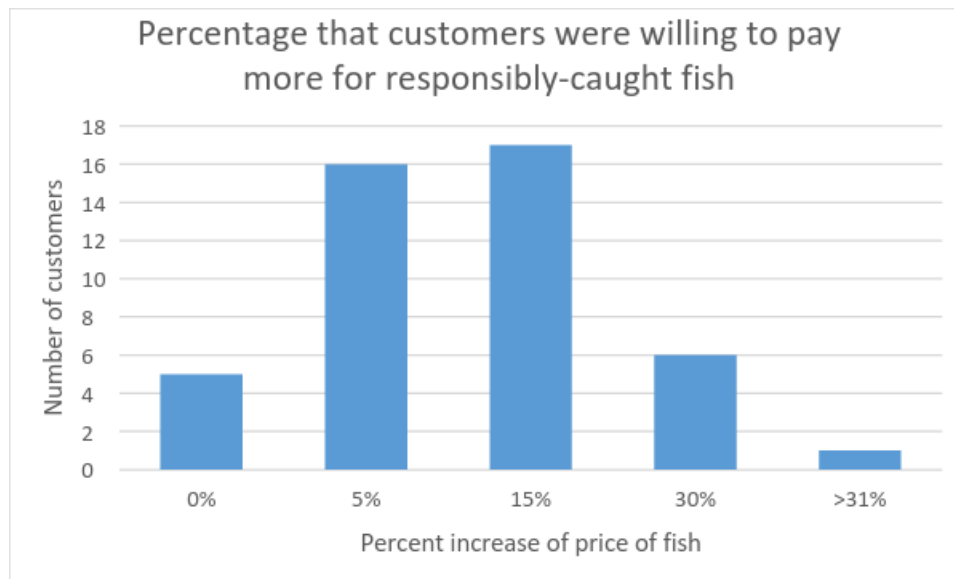


Figure 4.2: This figure shows the maximum percent price increase that consumers would pay for responsibly-caught fish over conventionally caught fish. Based on our sample size, we can be 95% sure that our results are accurate within 15%.

Yet while consumers understand responsible fishing just enough to understand that the product is of higher quality, we also found they are missing vital information about what responsible fishing entails.

#### 4.5.2 Consumer Awareness of Responsible Fishing

Even though the ideas of increased quality and helping the environment are enough to convince some people to pay more, the average consumer does not understand responsible fishing well enough to articulate what it is. Although 93% of the consumers surveyed reported they had heard of the term responsible fishing, only about 15% provided what qualified as a concrete definition of the term. For example, most consumers stated that responsible fishing is when the fisher does not fish in excess. While this statement is accurate, fishing responsibly goes beyond this simple explanation.

From our surveys at Isla Coco's, we also found that many customers were not aware of important information about the fish they buy and consume. For example, nearly 50% of the people surveyed said that when buying fish, they were not informed about where it was caught. Knowing where a fish was caught can provide insight into whether or not it was fished responsibly, as certain locations may be off-limits to fishing to allow the fish to repopulate. Additionally, 76% of the customers were not aware that the corvina served at Isla Coco's was responsibly-caught. While the restaurant only serves responsibly-caught fish, the majority of customers were unaware of that fact. As a result, the restaurant is missing out on a chance to inform consumers about responsible fishing while advertising their product.

On the other hand, many people were open to learning more information about fishing responsibly. We found that 80% of the surveyed customers wanted to receive additional information via email in order to improve their knowledge regarding responsible fishing. Many of the respondents also claimed that they would like to be further informed in the future about the origin of the fish they buy. In both cases, the consumers demonstrated a clear desire to learn more about responsible fishing.

## **4.6 Limitations**

During our project, we had one challenge that limited our research to some extent. When conducting interviews with prospective restaurants in Monteverde, we were unable to speak with as many restaurants as originally planned. While MarViva's contact in Monteverde screened 35 businesses for interviews, only nine agreed to meet with us. Any future research would be stronger if it included a larger base of corporate buyers in Monteverde that we were not able to reach. Interviewing a greater number of businesses in Monteverde and elsewhere would increase the pool of corporate buyers to choose from when creating new relationships for a future supply chain, helping to get a better match between a receiving center and a business.





# Chapter 5 – Recommendations and Conclusion

## 5.1 Recommendations

Our recommendations for MarViva focus on matching supply and demand for responsible fishing, as well as supporting the prospective responsible fishing supply chain from Costa de Pájaros.

**Our first recommendation is that MarViva matches Pescadería las Palmas with the Restaurante d’Sofia in the new prospective supply chain.** We are confident that this pilot relationship has the highest chances of success based on the qualities shown by both parties, as discussed in Section 4.4 of the findings.

To facilitate the formation of the new supply chain relationship, we suggest several steps for MarViva to take. First of all, MarViva needs to reach out to both parties to extend the invitation to form the relationship, making the two aware of the organization’s expectations of each in a responsible-fishing supply chain. MarViva has experience in reaching out to businesses, including the facilitation of the relationship between Cama Pez and Isla Coco’s, so it can follow its internal protocol when reaching out.

Second, MarViva needs to oversee the transition of Pescadería las Palmas from using conventional practices to using responsible ones that are aligned with their expectations of a receiving center. Again, MarViva is practiced in working with receiving centers to implement responsible methods, including with Cama Pez, so much of their own internal protocol will be followed. The adoption of responsible practices among receiving centers is a gradual process, so it is recommendable for MarViva to send a representative to Pescadería las Palmas every other week to oversee the changes.

Speaking specifically to the changes that MarViva should oversee, the biggest has to do with hygiene. The facilities in Pescadería las Palmas need to be renovated to improve the hygiene of

the receiving process, and so a MarViva representative would ensure that changes are made to the doorways so that the fish are not exposed to the outdoors, as well as general sanitation of the building. Over the same course of time, MarViva would need to confirm that their standards for responsibly fishing and receiving the fish are adopted. Through bi-weekly visits, MarViva would confirm that the proper hook and net sizes are being used, and that fish are being inspected properly and stored quickly on ice. Finally, MarViva would also oversee the implementation of its traceability system, which keeps track of information about the fish received to confirm that it is responsibly caught. Again, MarViva has experience in implementing the traceability system with Cama Pez, so the organization would follow its own protocol to ensure the proper records are kept. To aid MarViva in the overall process, the data from our research, along with these suggestions, are included in our report to them in Appendix D.

**Our second recommendation is that MarViva uses an informational pamphlet about responsible fishing to inform and reach out to additional restaurants.** A pamphlet we created for this purpose is included in Appendix E, and the front of the pamphlet can be seen below in Figure 5.1. This pamphlet could be given to the businesses either personally or electronically, providing a brief description of what responsible fishing entails and outline the benefits of selling responsibly-caught fish. It could also inform the businesses about the successful responsible fishing supply chain that exists between Cama Pez and Isla Coco's Restaurant, making them aware of the opportunity to work with MarViva in the future to form a new supply chain. We assert that this pamphlet could raise the businesses' awareness, and potentially their interest, of responsibly-caught fish, and could establish a line of communication through which MarViva can continue to select businesses to be included in the future creation of new supply chains.



Figure 5.2: This is an informational brochure that can be used to inform restaurants about the benefits of responsible fishing.

**Our third recommendation is that MarViva conducts additional surveys with consumers in restaurants selling conventionally-caught fish.** Because our research only covered consumers at a restaurant selling responsibly-caught fish, we assert that it would be beneficial for MarViva to collect data from people who have not been exposed to responsibly-caught fish and from people in restaurants where responsibly-caught fish is not yet sold. The data collected from these surveys would provide greater insight into the consumers' awareness and willingness to buy responsibly-caught fish. We recommend that for consistency, MarViva should administer the same survey we gave to customers at Isla Coco's Bar & Grill during our consumer survey, which can be seen in Appendix C. MarViva could start by targeting consumers outside of Puntarenas, in order to cover a demographic with less proximity to the existing supply chain in Costa de Pájaros. The survey could be implemented by contacting restaurants via email or written letter, inviting them to conduct a survey to better understand their consumers. A MarViva representative would likely have to conduct the survey in person as opposed to having the restaurant conduct it, to ensure the validity of the results. After conducting multiple surveys, MarViva could even compile the results in a spreadsheet to create a database of consumer information that could be used to support existing and future supply chains.

**Our fourth recommendation is that restaurants selling responsibly-caught fish should inform consumers about the responsibly-caught fish products being sold.** We assert that raising consumer awareness is essential for increasing the popularity of responsibly-caught fish, and also that the increased popularity will lead to greater profits for the restaurant selling the fish. With more information about the responsibly-caught fish, consumers will better understand that the increased price of the product reflects the higher quality and the extra time put in to protect the environment.

The information about responsible fishing should be disseminated to consumers in a variety of ways. The restaurants could have a note on their menus to say that the fish was responsibly-caught next to the item on the menu, in addition to including placemats with a diagram or cartoon advertising the responsibly-caught fish and explaining its benefits. Restaurants could also use shirts for the staff to wear, with slogans to promote responsible fishing. Going even further, advertising ideas for shirts and slogans could be extended to raising awareness among the general public. Example designs for a shirt can be seen below in Figure 5.1, the full design for shirts, a menu, and a sign are attached in Appendix F.

Of course, there is the possibility that advertising responsibly-caught fish at a restaurant could potentially drive customers away, as they may be uninterested in paying more for the product, or misunderstand the extent to which they would pay more. Should this scenario be a concern to a restaurant, the advertising for responsibly-caught fish could be limited to within the restaurant, where the fish is served. In this way, customers could be well informed about the responsibly-caught fish on the menu, without having the subject brought upon them before they even walk in the door.



Figure 5.3: This is a design for a t-shirt that would inform customers that the size of the fish, hook, and net matters, an important aspect of responsible fishing.

## 5.2 Conclusion

When we arrived in Costa Rica, we set the goal of assisting MarViva in evaluating and matching suppliers and buyers for inclusion in a prospective responsible fishing supply chain. While our recommendations had the immediate focus of creating and supporting a single restaurant-receiving center relationship in a supply chain between Costa de Pájaros and Monteverde, we hope that our work can be used to establish additional responsible fishing supply chains in the future. Using our work as a guide, MarViva can connect more suppliers and buyers of responsibly-caught fish in Costa de Pájaros and in other fishing regions around Costa Rica. Additionally, our work can be used by organizations and businesses apart from MarViva to increase the general consumer awareness and knowledge of responsible fishing. For example, restaurants or supermarkets that sell responsibly-caught fish can implement the advertising materials we created to raise customer awareness of the benefits and superior quality of the product.

However, the key to spreading the use of responsible fishing methods may not be simply raising awareness of the issue. According to MarViva, many fishers in Costa de Pájaros understand the

purpose and methods of responsible fishing, but lack motivation to switch to the less profitable methods. Thus, to increase the impact of responsible fishing, fishers need to be incentivized to fish responsibly. In other words, lucrative business relationships between receiving centers and corporate buyers are big motivators for fishers to use responsible methods, hence why we evaluated prospective relationships for a new supply chain. In order for the environmental benefits of responsible fishing to become more widespread, not only does awareness need to be raised, but business relationships along the supply chain need to be formed and developed.

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# Appendix A – Receiving Center Interview Questions

## La encuesta de los recibidores

Somos estudiantes del Instituto Politécnico de Worcester en Massachusetts, Estados Unidos, trabajando como voluntarios para la Fundación MarViva.

Estamos realizando entrevistas con recibidores de pescado en Costa de Pájaros con el objetivo de determinar las características del producto que se está comercializando actualmente. Su contribución es sumamente valiosa. Si está interesado usted, podría tener una copia de nuestros resultados al fin de este estudio. Muchas gracias por su participación.

Nombre del Recibidor: \_\_\_\_\_

1. ¿Hace cuánto opera este recibidor en Costa Pájaros?
2. ¿Cuánto personal trabaja en el recibidor?
3. ¿Cuáles especies de pescado recibe Ud. típicamente?
4. ¿Qué volumen (kg) de pescado recibe Ud. en promedio mensualmente?
5. ¿En cuáles temporadas hay más producto y en cuáles temporadas hay menos producto?
6. ¿Cuántos pescadores se traen pescado, típicamente?
7. ¿Dónde pescan sus pescadores?
8. ¿Cambia el número de pescadores durante el año/ la estación? ¿Por qué?
9. ¿Cómo pescan sus pescadores?  
Cuerda (a mano)

Trasmallo

Linea (a mano o fondo)

Chinchorro

Atarraya

- a. ¿Dónde pescan sus pescadores de...? ¿Cuáles son los sitios más populares o los sitios más específicos en que pescan?
- b. ¿Si usa Ud. trasmallos, cuál es el tamaño de la luz de malla?
- c. ¿Si usa Ud. cuerda a mano, que tipos de anzuelos usa?

10. ¿Cómo determina el precio a pagar al pescador por el producto?

11. ¿La forma de pago al pescador, ¿es de contado?

12. ¿Ofrece algún tipo de apoyo o ayuda a sus pescadores (alistó por ejemplo)? Si sí, cómo lo cobra?

13. ¿Cómo recibe el pescado?

- a. ¿Con hielo o sin hielo
  - i. ¿Tiene hielo o se trae?
- b. ¿Eviscerado o sin eviscerar

14. ¿Cómo es el proceso de recibo del producto (revisión organoléptica, eviscerado, temperatura, clasificación, pesaje, almacenamiento)?

15. ¿Cuánto dura el producto almacenado antes de ser despachado?

16. ¿El recibidor cuenta con su propio camión para despacho?

17. ¿Tiene una tienda de pescado en el sitio para venderlo?

18. ¿A quién le vende su producto pesquero?

- Clientes estables/frecuentes
- Busca clientes cada vez

19. ¿Cuáles son las condiciones de pago al comprador? (contado/crédito (cuánto tiempo)/otras)

20. ¿Cómo determina el precio de venta?

21. ¿Cuáles son los valores más importantes para hacer negocios?

22. ¿Ha escuchado sobre el programa de pesca responsable de la Fundación MarViva?

23. ¿Qué ha escuchado o qué entiende por este programa?

24. Si fuera a participar de este programa,

- ¿qué esperaría de MarViva?
- ¿qué esperaría de un cliente potencial?
- ¿qué puede ofrecerle usted a ese cliente potencial?

# Appendix B – Corporate Buyer Interview Questions



## CORREDOR BIOLOGICO PAJARO CAMPANA

Somos estudiantes del Instituto Politécnico de Worcester en Massachusetts, Estados Unidos.

Estamos apoyando al Corredor Biológico Pájaro Campana para hacer un inventario de la demanda de pescado y mariscos en Monteverde y para ello estamos realizando entrevistas a empresarios del sector de Alimentos & Bebidas.

El objetivo del estudio es determinar el potencial de establecer relaciones comerciales dentro del Corredor Biológico del Pájaro Campana, específicamente en cuanto a proveeduría de pescados y mariscos.

Sus aportes son valiosos.

Nombre del establecimiento: \_\_\_\_\_

Nombre de la persona entrevistada: \_\_\_\_\_

Datos de contacto:

Para efectos de tabulación, es mejor poner nomenclatura (número) a las preguntas)

1. ¿Qué tipo de negocio?

- 1.1) Hotel
- 1.2) Restaurante
- 1.3) Soda
- 1.4) Otro. Especifique

2. ¿Cuántas mesas tiene usted, aproximadamente?

- 2.1) 0-10
- 2.2) 11-20
- 2.3) 21-30
- 2.4) 31-40
- 2.5) 41+

3. ¿Qué volumen del pescado compra usted por cada mes, usualmente?

- 3.1) Menos de 10 kilos
- 3.2) Entre 20 – 30 kilos
- 3.3) Entre 30 – 40 kilos

- 3.4) Entre 50 – 60 kilos
- 3.5) Entre 60 – 70 kilos
- 3.6) Más de 70 kilos

4. ¿Cuál es la frecuencia de compra del pescado?

- 4.1) Dos veces a la semana
- 4.2) 1 vez a la semana
- 4.3) Cada 15 días
- 4.4) Mensual
- 4.5) Cuando se le termina lo que tiene

5. ¿Cuáles son los factores considera cuando compra o consume pescado?

- 5.1) Calidad
- 5.2) Confianza
- 5.3) Precio
- 5.4) Lugar de entrega
- 5.5) Procedencia – producción sostenible
- 5.6) Otro\_\_\_\_\_

6. ¿Cambia el volumen de pescado que compra usted durante el año/ la estación?

- 6.1) Sí
- 6.2) No

7. ¿Si es así, cuáles cree usted que son las causas de esta variación?

7.1)\_\_\_\_\_

7.2)\_\_\_\_\_

7.3)\_\_\_\_\_

7.4)\_\_\_\_\_

8. ¿Cuáles tipos de pescado compra usted normalmente? (Escoja todas de las opciones que se aplican)

- 8.1) Anguila
- 8.2) Atún
- 8.3) Bagre
- 8.4) Barracuda
- 8.5) Berrugate
- 8.6) Cabrilla
- 8.7) Congrio
- 8.8) Corvina
- 8.9) Dorado
- 8.10) Jurel
- 8.11) Lenguado
- 8.12) Loro
- 8.13) Macarela
- 8.14) Marlin
- 8.15) Mero
- 8.16) Pangasio (“corvineta”)

- 8.17) Pargo
- 8.18) Pez Espada
- 8.19) Pez Vela
- 8.20) Raya
- 8.21) Robalo
- 8.22) Roncador
- 8.23) Salmón
- 8.24) Tiburón (“cazón/bolillo”)
- 8.25) Tilapia
- 8.26) Trucha
- 8.27) Wahoo
- 8.28) Otro

9. ¿Cuál es la presentación del pescado que compra? (escoja todas las que aplique)

- 9.1) Entero
- 9.2) Fileteado
- 9.3) Lomo
- 9.3) Pansa
- 9.4) Chuleta
- 9.5) Cabeza
- 9.6) Aletas
- 9.7) Picadura

10. ¿Compra el pescado fresco o congelado?

- 10.1) Fresco
- 10.2) Congelado

11. ¿Qué precio paga usted por el pescado, típicamente?

Esto debería ser por especie::

- 11.1) Especie \_\_\_\_\_ Colones por kilo: \_\_\_\_\_.
- 11.2) Especie: \_\_\_\_\_ Colones por kilo: \_\_\_\_\_
- 11.3) Especie: \_\_\_\_\_

12. ¿Cambia el precio que paga usted por el pescado durante el año/ la estación?

- 12.1) Sí
- 12.2) No

12.A. ¿Cuánto cambia el precio en temporadas?

- 12.A.1. Menos del 10%
- 12.A.2 Entre el 10 – 15%
- 12.A.3 Entre el 15 – 30%
- 12.A.4. Más del 40%

13. ¿Quién es su proveedor actual?

- 13.1) \_\_\_\_\_

14. ¿Cuál es su método de entrega?

- 14.1) Entregan en la empresa.  
14.2) Por encomienda  
14.3) Se va a recoger a centro de acopio Dónde?\_\_\_\_\_
15. ¿Cuál es su forma de pago por el pescado?  
15.1) El dinero en efectivo/ un cheque el mismo día de pago  
15.2) Contado  
15.3 Crédito (¿Cuántos días?)
16. ¿Cómo decide la especie de pescado que compra?  
16.1) La disponibilidad  
16.2) El precio  
16.3) La popularidad  
16.4) La familiaridad  
16.5) Otro
18. ¿Estaría usted dispuesto a implementar las especies alternativas o no tradicionales en su menú?  
18.1) Sí  
18.2) No  
18.3) Quizás  
18.4) Quiero aprender más
19. ¿Ha escuchado el término de “pesca responsable?”  
19.1) Sí  
19.2) No
20. ¿Qué entiendo usted por el término “pesca responsable?”  
20.1)\_\_\_\_\_
- 21.- ¿Conoce usted qué es el Corredor Biológico Pájaro Campana?  
21.1) Sí  
21.2) No
22. ¿Estaría usted dispuesto a adquirir producto de pesca responsable proveniente del Corredor Biológico Pájaro Campana?  
22.1) Sí  
22.2) No

# Appendix C – Consumer Survey Questions

## **La encuesta de los consumidores**

Somos un grupo de estudiantes de Worcester Polytechnic Institute en los Estados Unidos, y estamos trabajando aquí en Costa Rica. Trabajamos con Don Mario para obtener un mejor entendimiento del pescado que está capturado y vendido en esta área. Su participación en esta encuesta es voluntaria, y podría retirarse en cualquier momento. Si está interesado usted, podría tener una copia de nuestros resultados al fin de este estudio. Muchas gracias por su participación.



SECCIÓN I	Aspectos generales	
1. Edad		
18-30	<input type="checkbox"/>	31-45 <input type="checkbox"/> 46-60 <input type="checkbox"/> 61+ <input type="checkbox"/>
2. Género		
Femenino (1)	<input type="checkbox"/>	Masculino (2) <input type="checkbox"/>
3. ¿Cuál es su nivel de estudios?		
(1) Ninguno		<input type="checkbox"/>
(2) Primaria		<input type="checkbox"/>
(3) Secundaria		<input type="checkbox"/>
(4) Estudios Técnicos		<input type="checkbox"/>
(5) Estudios Universitarios		<input type="checkbox"/>
(6) Posgrado		<input type="checkbox"/>
SECCIÓN II	Hábitos y preferencias del consumidor	
4. ¿Con qué frecuencia usted consume pescado?		
(1) Una vez a la semana		<input type="checkbox"/>
(2) Más de una vez a la semana		<input type="checkbox"/>
(3) Una vez al mes		<input type="checkbox"/>
(4) Más de una vez al mes		<input type="checkbox"/>
(5) Una vez al año		<input type="checkbox"/>
(6) No consume pescado		<input type="checkbox"/>
5. Normalmente, ¿Cómo consume ese pescado?		
(1) Enlatado		<input type="checkbox"/>
(2) Filete		<input type="checkbox"/>
(3) Entero		<input type="checkbox"/>
(4) Sushi		<input type="checkbox"/>
(5) Otro		<input type="checkbox"/>
6. ¿En dónde consume ese pescado?		
(1) Casa		<input type="checkbox"/>
(2) Restaurante		<input type="checkbox"/>
(3) Otro	¿En dónde?	<input type="checkbox"/>
7. ¿Dónde compra pescado?		
(1) Feria		<input type="checkbox"/>
(2) Pescaderías		<input type="checkbox"/>
(3) Supermercados		<input type="checkbox"/>
(4) Otro		<input type="checkbox"/>
8. ¿Cuáles son los factores que tiene en cuenta cuando compra o consume pescado?		
(1) Calidad		<input type="checkbox"/>
(2) Confianza		<input type="checkbox"/>
(3) Precio		<input type="checkbox"/>
(4) Porque se usan formas de captura responsables		<input type="checkbox"/>
(5) Otro		<input type="checkbox"/>
9. En donde compra o consume pescado, ¿le informan sobre el origen o la proveniencia del mismo?		
Si (1)	<input type="checkbox"/>	No (2) <input type="checkbox"/>

10. ¿Del siguiente listado de peces, usted cuáles compra o consume?

Nombre Común Simple *	SI (1)	NO (2)
ANGUILA		
ATUN		
BAGRE		
BARRACUDA		
PANGASIO ("corvineta")		
BERRUGATE		
CABRILLA		
CONGRIO		
CORVINA		
DORADO		
JUREL		
LENGUADO		
LORO		
MACARELA		
MARLIN		
MERO		
PARGO		
PEZ ESPADA		
PEZ VELA		
RAYA		
ROBALO		
RONCADOR		
TIBURON		
WAHOO		
SALMON		
TIBURON ("cazón/bolillo")		
TILAPIA		
TRUCHA		
OTRO		
¿Cuáles?		

11. ¿Cuál es su pescado favorito?

---

### SECCIÓN III

#### Aspectos específicos sobre el tema de pesca

12. Si usted sabe que su pescado favorito está en vía de extinción, ¿estaría dispuesto a no comprarlo?

Si (1)  No (2)

13. ¿Has escuchado el término de "pesca responsable?"

Si (1)  No(2)

14. ¿Cómo defina el término de "pesca responsable?"

15. ¿Qué piensa sobre el precio del pescado? Piensa que el precio del pescado es...

Inalcanzable   
Caro   
Razonable

Barato   
No está seguro

16. ¿Estaría usted dispuesto a pagar más por el pescado, si sabe que este es obtenido cumpliendo con criterios de pesca responsable?

Si (1)

No (2)

17. ¿Cuántos estaría usted dispuesto a pagar más por un pescado obtenido responsablemente?

0%

1-5%

6-15%

16- 30%

>31%

18. ¿Sabe usted que la corvina servida en este restaurante es de pesca responsable?

Si (1)

No (2)

19. Si pudiera obtener más información sobre su pescado, en una escala de 1 a 5 (en donde 1 es el puntaje más bajo y 5 el más alto) ¿qué sería más importante saber?

- Conocer la talla del pescado
- Conocer la forma de captura del pescado
- Conocer en dónde fue capturado el pescado
- Conocer el especie del pescado
- Conocer su grado de vulnerabilidad / amenaza

20. ¿Estaría interesado en recibir más información acerca de pesca responsable por correo electrónico? Si quiere, escriba su email.

---

# Appendix D – Report Given to MarViva

\*NOTE: For purposes of this paper, appendices in this report have been updated to reflect those used in this paper, and not the ones used in MarViva’s report. This is to avoid repetition of material.

## *Fishing for New Markets*



*A WPI undergraduate project done in conjunction with MarViva  
Whitney Davis, Androniqi Qifti, April Solon, Nathan Stomberg*

### **Introduction**

When we arrived in Costa Rica, we set the goal of assisting MarViva in evaluating and matching suppliers and buyers for inclusion in a prospective responsible fishing supply chain. While our recommendations had the immediate focus of creating and supporting a single restaurant-receiving center relationship in a supply chain between Costa de Pájaros and Monteverde, we hope that our work can be used to establish additional responsible fishing supply chains in the future. The following report details which receiving center and restaurant we recommend MarViva matches in a relationship, as well as key conclusions reached from our consumer surveys at Isla Coco’s restaurant. Full results from our interviews can be found in Appendices A and B. We greatly enjoyed working with MarViva and hope that this information will be useful in the future.

### **Pescadería las Palmas has the most potential to be added in the prospective responsible supply chain**

#### **Methodology**

- We conducted semi-structured interviews at two prospective receiving centers in Costa de Pájaros: Pescadería de las Palmas and Pez y Mar.
- We used the Cama Pez de la Costa receiving center as the model to which to compare the prospective receiving centers.
- To evaluate the prospective receiving centers effectively and without bias, we established criteria based on our observations of Cama Pez and MarViva’s expectations of a receiving center.
- Specifically, the criteria used were:
  - Hygiene: the overall hygiene of the facilities and receiving process
  - Transparency: transparency of record keeping and receiving process
  - Value of stability in business relationships
  - Attitude: the overall attitude towards responsible fishing
- We rated the prospective receiving centers in each category using a scale of 1-3 where 1 meant the receiving center fell short of meeting the criterion, 2 meant it met the criterion, and 3 meant it exceeded the criterion. The total scores of all four categories for each

receiving center were then tallied and compared. The scores for each receiving center are shown in Table 2. The breakdown of each score will be discussed in detail in the following sections.

## Hygiene

- At Pescadería las Palmas, we observed minimal sanitation of their facilities, which were open to the outdoors, and they reported that while all of their fish is iced upon arrival, some of their fish is not on ice when it is received. We gave Pescadería las Palmas a **1 out of 3** for hygiene because it fell below the standard set by Cama Pez.
- Pez y Mar had similar problems with the sanitation of their facilities. However, a serious red flag was that the fish they receive is not eviscerated, which invites contamination. As a result, we also evaluated Pez y Mar as a **1 out of 3** for hygiene because their problems placed them well below Cama Pez's standard of cleanliness.

## Transparency of receiving process

- At Pescadería las Palmas, we observed a lack of record keeping about the fish that is received; however, they showed the desirable level of openness about their process. We were able to easily collect necessary data about their receiving process as well as the methods used by their fishermen. Because they can easily improve their record keeping and implement MarViva's traceability system, they received a **2 out of 3**.
- At Pez y Mar, we noticed a similar lack of record keeping. Additionally, the owner, Don Julio, was very guarded when describing his receiving process, and tailored his answers to our expectations by referencing MarViva's brochure on responsible fishing guidelines. For these reasons, Pez y Mar fell below the standard and received a **1 out of 3** for transparency because the owner's guarded nature would make it challenging for MarViva or the prospective restaurant to work with him.

## Valuing the stability and business relationships

- We found that Pescadería las Palmas placed value on their business relationships. As seen in Table 1, they have 4 stable clients and 25 regularly returning fishermen, representing an ability to establish commitment and trust in their relationships. Additionally, Don Sabino spoke about how he is loyal to his established clients and stated that he prioritizes satisfying his business deals with them over how much money he can get from other people. Thus, we ranked Pescadería las Palmas as a **2 out of 3**.
- Don Julio of Pez y Mar revealed less about valuing stable relationships, stating that he does not have contracts with anyone and that he will sell to whomever offers the best price. Based on his lack of both loyalty and established relationships with clients and fishermen, as seen in Table 2, we rated Pez y Mar as a **1 out of 3** for this category.

## Attitude towards responsible fishing

- At Pescadería las Palmas, we observed a strong commitment to supplying a high quality product to the end consumer. Similarly, Don Sabino displayed a high level of interest in distributing responsibly-caught fish due to its superior quality. We gave Pescadería las Palmas a **3 out of 3**.
- Although Don Julio of Pez y Mar showed a high interest in working with MarViva, he told us he was motivated to enter the prospective supply chain by the potential financial benefits of selling a product with an increased price. We observed that he prioritized price over the quality of the product, and displayed a lack of concern about the environmental benefits responsible fishing entails. For these reasons, we gave Pez y Mar a **1 out of 3**.

## Data

Table 1: This table shows a direct comparison between data collected from the established receiving center, Cama Pez de la Costa, and prospective receiving centers, Pescadería las Palmas and Pez y Mar. This is the most relevant data to our evaluation as discussed above.

Receiving Center Name	Cama Pez de la Costa (Established)	Pescadería las Palmas (Prospective)	Pez y Mar (Prospective)
Owned by	Don Manrique Medrano	Don Sabino Trejos	Don Julio Gomez
Is fish received on ice?	Yes	Sometimes	Yes
Is the fish received eviscerated?	Yes	Yes	No
Methods used by fishermen	Handline, Gillnet, Longline	Handline and Gillnet	Handline, Gillnet, Longline, Cast Net, Beach Seine Net
Net size used	3.5 inches	3.5 inches	3.5 inches
Hook type used	6 and 7	7	6 and 7
Number of established fishermen	26	25	5
Number of stable clients	6	4	5

Table 2: This table shows the scores given to the prospective receiving centers in each category.

Receiving Center	Pescadería las Palmas (Don Sabino)	Pez y Mar (Don Julio)
Overall Hygiene	1	1
Transparency of Receiving Process	2	1
Valuing Stable Business Relationships	2	1
Attitude Towards Responsible Fishing	3	1
<b>Total Score (12 pts possible)</b>	<b>7</b>	<b>4</b>

## Conclusions

- As seen in Table 2, Pescadería las Palmas received a total score of **7 points** out of the 12 points possible, while Pez y Mar received a total score of **4 points**.
- Overall, hygiene, transparency of process, reliability of supply, and enthusiasm for responsible fishing are the key components that distinguished Pescadería de las Palmas from Pez y Mar.
- **We recommend that MarViva work with Pescadería las Palmas as the prospective receiving center with which to create the new supply chain.**
- Some changes must be made for Pescadería las Palmas for them to be successful in this responsible fishing supply chain:
  - Implementation of the traceability system being put in place at Cama Pez
  - Improve overall hygiene through cleaning of the facilities
  - Ensuring the fish put on ice promptly after being received
  - Add curtains to doorways to separate the fish from the outside environment
  - Other changes deemed necessary at MarViva's discretion

## Restaurante d'Sofia has the most potential to be added in the prospective responsible supply chain

### Methodology

- We conducted semi-structured interviews at nine restaurants in Monteverde.
  - Restaurants interviewed: Morphos Restaurant, Musashi, Restaurante Amy's, Restaurante de Lucia, Restaurante d'Sofia, Restaurante Don Luis, Restaurante Sabor Tico, Tramonti Pizzeria y Restaurante, and Tree House Restaurante y Café
- We used Isla Coco's Bar & Grill as an example with which to compare the prospective restaurants.
- To evaluate the restaurants, we established criteria based on our observations of Isla Coco's and MarViva's expectations.
- The criteria used to evaluate the restaurants were:
  - Prioritization of product quality
  - Willingness to incorporate alternative species on the menu
  - Valuing stability in business relationships
  - Attitude towards responsible fishing
- We rated the prospective restaurants in each category using a scale of 1-3 where 1 meant the restaurant fell short of meeting the criterion, 2 meant it met the criterion, and 3 meant it exceeded the criterion. The total scores of all four categories for each restaurant were then tallied and compared. The scores for each restaurant are shown in Table 4. The breakdown of each score will be discussed in detail in the following sections.

### Prioritizing a Quality Product

- Restaurante d'Sofia, Restaurante de Lucia, and Tree House Restaurant received a **3 out of 3** because they placed great importance on serving a quality product to their customers and prioritized it over price.
- Restaurante Amy's, Restaurante Don Luis, and Tramonti Pizzeria y Restaurante displayed an adequate concern for the quality of their fish and were given a score of **2 out of 3**.

- Morphos Restaurant and Restaurante Sabor Tico received a **1 out of 3** because they valued the price of fish over its quality, indicating that they would sacrifice the quality of the product for a lower price.
- Although Musashi said they prioritized quality, they indicated that their product was delivered “*por encomienda*”, or by public bus. As public transportation is not a good way to keep fish fresh, this shows that Musashi does not completely prioritize quality to the extent that they indicated, thus receiving a **1 out of 3**.

### Willingness to Incorporate Alternative Species

- Restaurante Don Luis, Restaurante Sabor Tico, Tramonti, and Tree House Restaurante were not willing to be flexible with the types of fish on their menu, thus receiving a **1 out of 3**.
- Restaurante d’Sofia stood out for their particular enthusiasm in this regard, reporting that they would be excited to sell different species of fish to allow fish populations to replenish. They received a **3 out of 3**.
- The other four restaurants were willing to change their menu, thus receiving a **2 out of 3** as seen in Table 4.

### Value of stability and business relationships

- Seven of the nine restaurants interviewed had a stable relationship with a supplier from whom they bought fish on a regular basis. Therefore, they would likely exhibit the same stability in a business relationship with a prospective receiving center, and thus received a score of **2 out of 3** for this category.
- Tree House Restaurant’s and Restaurante Sabor Tico’s did not have an established supplier, but rather bought fish from the municipal market as needed. They show less potential to have a successful relationship with one of the prospective receiving centers and received a score of **1 out of 3**.

### Attitude towards Responsible Fishing

- We found that the owner of Restaurante d’Sofia again distinguished himself with his knowledge and appreciation of how responsible fishing positively impacts both the quality of the product and the environment. He expressed great interest in incorporating responsibly-caught fish, including alternative species, on his menu as a way to help preserve the marine ecosystem, and thus received a 3 in this category.
- Morphos Restaurant, Musashi, Restaurante Amy’s, and Restaurante de Lucia all were interested in responsibly-caught fish, but showed some reservation about selling it, including the increased price and the timeline for adding it to the menu, and so received a **2 out of 3**.
- The remaining four restaurants were all unwilling to include alternative species on their menu and did not show an adequate level of interest to guarantee they would be committed to selling responsibly-caught fish if included in the new supply chain. Therefore, we gave them a score of **1 out of 3**.



## Data

Table 3: This table shows a direct comparison between the established restaurant, Isla Coco's (highlighted in blue), and the nine prospective restaurants.

Restaurant Name	<i>Isla Coco's Bar &amp; Grill</i>	<i>Morphos Restaurant</i>	<i>Musashi</i>	<i>Restaurante Amy's</i>	<i>Restaurante de Lucia</i>	<i>Restaurante d'Sofia</i>	<i>Restaurante Don Luis</i>	<i>Restaurante Sabor Tico</i>	<i>Tramonti Pizzeria y Restaurante</i>	<i>Tree House Restaurante y Café</i>
Factors considered when purchasing and serving fish	Quality, Sustainability	Price	Quality	Quality	Quality	Quality, Sustainability	Quality	Price	Quality, Trust, Price	Quality, Price, Freshness
Are they willing to add alternative species to the menu	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
From whom do they currently buy their fish	Manrique Mediono	Luis Carlos Rodriguez	Jose Angel	Miguel Jilarango	Miguel Jilarango	Marvin Trejos	Municipal Market in Puntarenas	A Retailer in Monteverde	Miguel Jilarango	Municipal Market in Puntarenas

Table 4: This table shows scores each prospective restaurant received for each of the four criteria.

Restaurant Name	<i>Morphos Restaurant</i>	<i>Musashi</i>	<i>Restaurante Amy's</i>	<i>Restaurante de Lucia</i>	<i>Restaurante d'Sofia</i>	<i>Restaurante Don Luis</i>	<i>Restaurante Sabor Tico</i>	<i>Tramonti Pizzeria y Restaurante</i>	<i>Tree House Restaurante y Café</i>
Prioritizing Product Quality	1	1	2	3	3	2	1	2	3
Willingness to Incorporate Alternative Species	2	2	2	2	3	1	1	1	1
Valuing Stability in Business Relationships	2	2	2	2	2	2	1	2	1
Attitude Towards Responsibly Caught Fish	2	2	2	2	3	1	1	1	1
<b>Total Score (12 pts possible)</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>11</b>	<b>6</b>	<b>4</b>	<b>6</b>	<b>6</b>

## Conclusions

- As seen in Table 4, Restaurante d’Sofia received the highest score of **11 points** out of the possible 12.
- Restaurant d’Sofia was differentiated from the eight other restaurants by their value of a quality product, willingness to incorporate alternative species, appreciation of stable business relationships, and overall positive attitude towards responsibly-caught fish.
- **We recommend that MarViva work with Restaurante d’Sofia as the prospective with which to create the new supply chain.**
- From our interviews, we also found that some of other restaurants, while not as qualified as Restaurante d’Sofia, showed potential to be included in a similar supply chain in the future. Additionally, there are a number of other restaurants and hotels in Monteverde that we did not get a chance to interview.
- **We recommend that MarViva use an informational pamphlet about responsible fishing to inform and reach out to additional restaurants.**
- This pamphlet could raise the businesses’ awareness, and potentially their interest, of responsibly-caught fish, and could establish a line of communication through which MarViva can continue to select businesses to be included in the future creation of new supply chains. A pamphlet we created for this purpose is in Appendix E.
  - This pamphlet could be given to the businesses either personally or electronically.
  - It provides a brief description of what responsible fishing entails and outlines the benefits of selling responsibly-caught fish.
  - It also inform the businesses about the successful responsible fishing supply chain that exists between Cama Pez and Isla Coco’s Restaurant, making them aware of the opportunity to work with MarViva in the future to form a new supply chain.

## Catching the Perfect Match

Since the prospective restaurant and receiving center need to be a good match as well as be strong candidates on their own, we took into consideration what receiving centers needed from restaurants and what the restaurants expected from their supplier. The potential receiving centers explained how they need a client who can form a strong relationship and commit to absorbing their fish supply. Additionally, when buying fish from the receiving centers, quality of the product and reliability in the supply are the two most important factors that Monteverde businesses have in mind. Restaurante d’Sofia showed that they value established relationships and are willing to consistently absorb the supply of fish from the prospective receiving center. Additionally, Pescadería las Palmas demonstrated that they value loyalty and established relationships when dealing with clients and are passionate about providing a high quality product. **For these reasons, we recommend MarViva matches Pescadería las Palmas and Restaurante d’Sofia, as they have an outstanding potential to be partners in the new responsible fishing supply chain.**

## Assessing Consumer Awareness and Demand

To evaluate the consumers’ awareness of responsibly-caught fish we surveyed the consumers of Isla Coco’s, the restaurant in the established responsible fishing supply chain. Since the consumers impact the entire responsible fishing supply chain, we used the information about

their awareness and demand to determine ways to better support both the established and prospective supply chains.

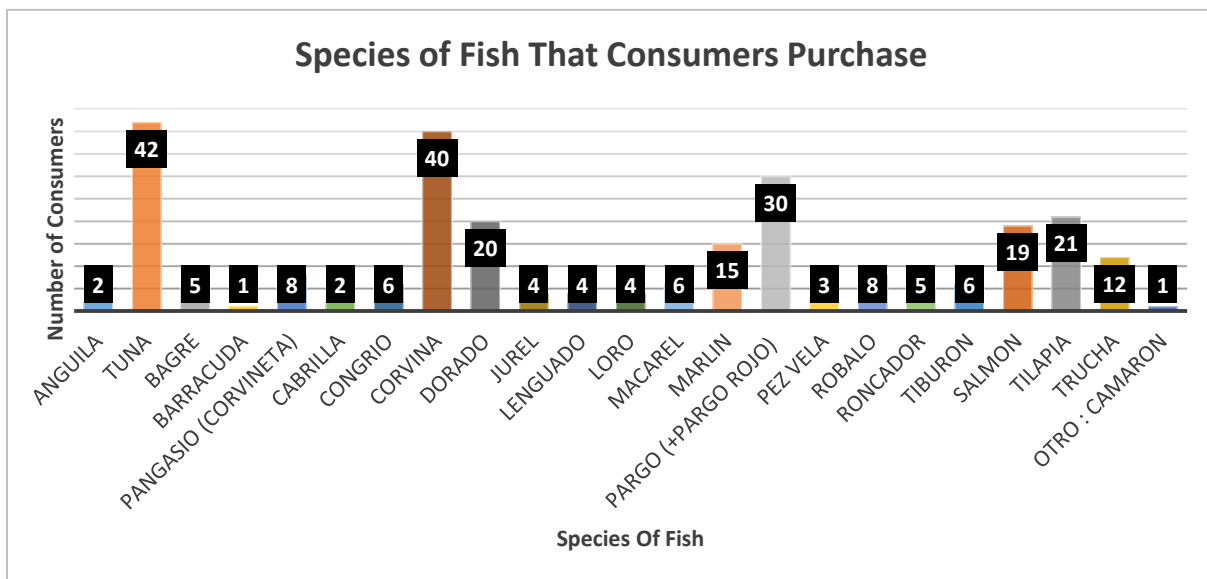
## Methodology

- We administered structured surveys of customers at **Isla Coco’s Bar & Grill**.
- We surveyed **45 customers** during Saturday lunch and dinner and Sunday lunch at Isla Coco’s.
  - We did a sample size calculation: for a population of 250 people (the average number of customers Isla Coco’s receives during the weekend), a 95% confidence level, and a confidence interval of 15, our sample size was 37 consumers to survey.
  - We exceeded our confidence level by surveying a total of 45 consumers, meaning our results are slightly more than 95% certain to be accurate within 15%.
- From the surveys we determined the consumers’ buying/eating habits, knowledge of responsible fishing, and interest in responsibly-caught fish.
- In the following sections, graphs of the most relevant data can be seen.

## Key Results

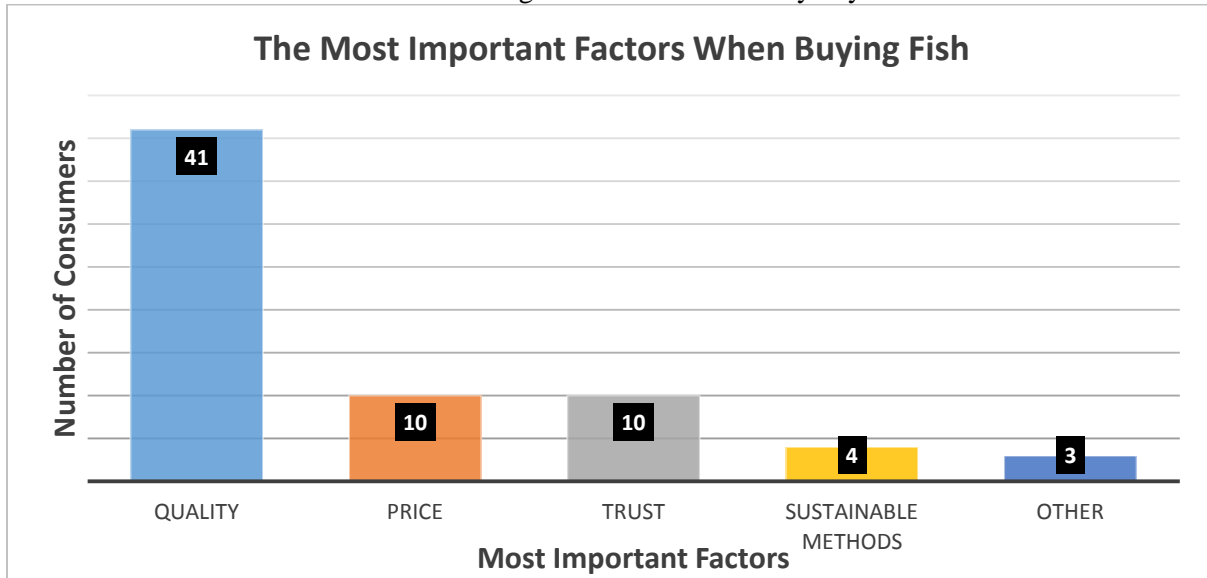
### Consumers most commonly purchase Tuna, Corvina and Pargo

- We asked customers what type of fish they buy or consume.
  - 93.3% of the customers purchase tuna, 88.9% purchase corvina, and 66.7% purchase pargo



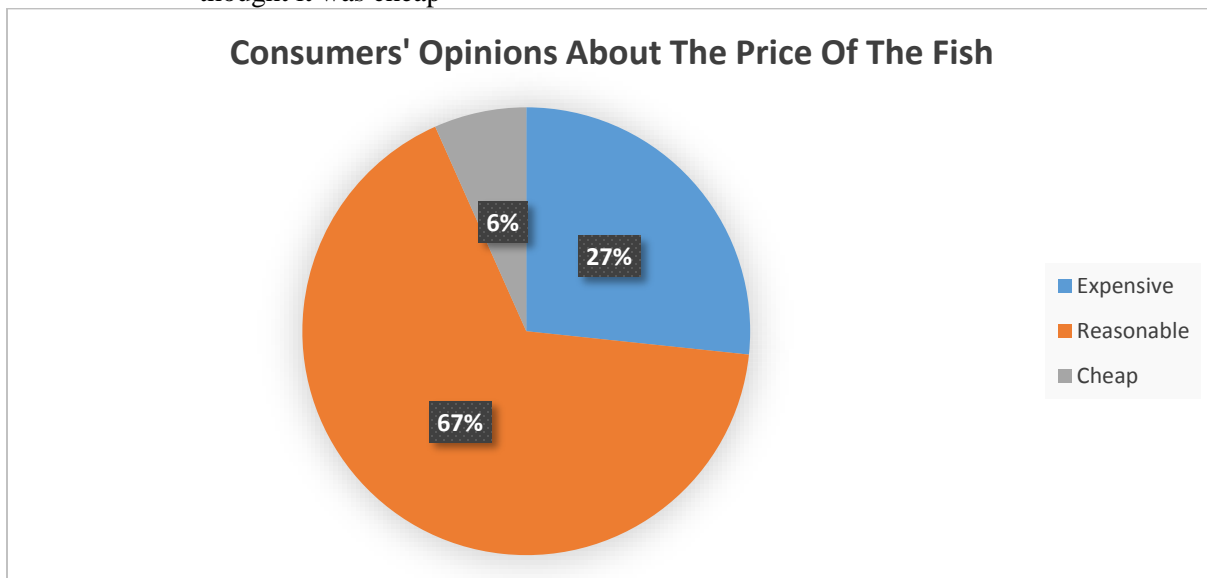
## Consumers value the quality of the responsibly caught fish

- We asked customers what they qualities they consider most important when they buy or consume fish
  - 91.1% of the responders consider quality important factor when buying fish, 22.2% consider the price important, 22.2% consider the level of trust important, and only 8.9% consider the sustainable origin of the fish when they buy it.



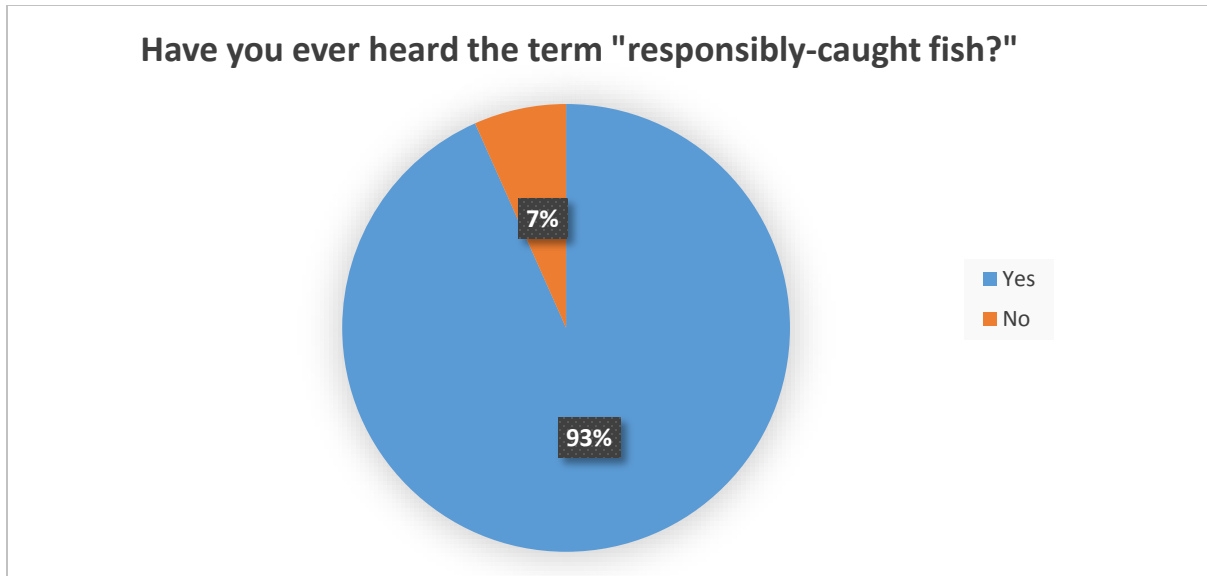
## Consumers consider the price of fish reasonable

- We asked their opinion of the price of fish
  - 67% of consumers thought fish is reasonably priced, 27% thought it is expensive, and 6% thought it was cheap



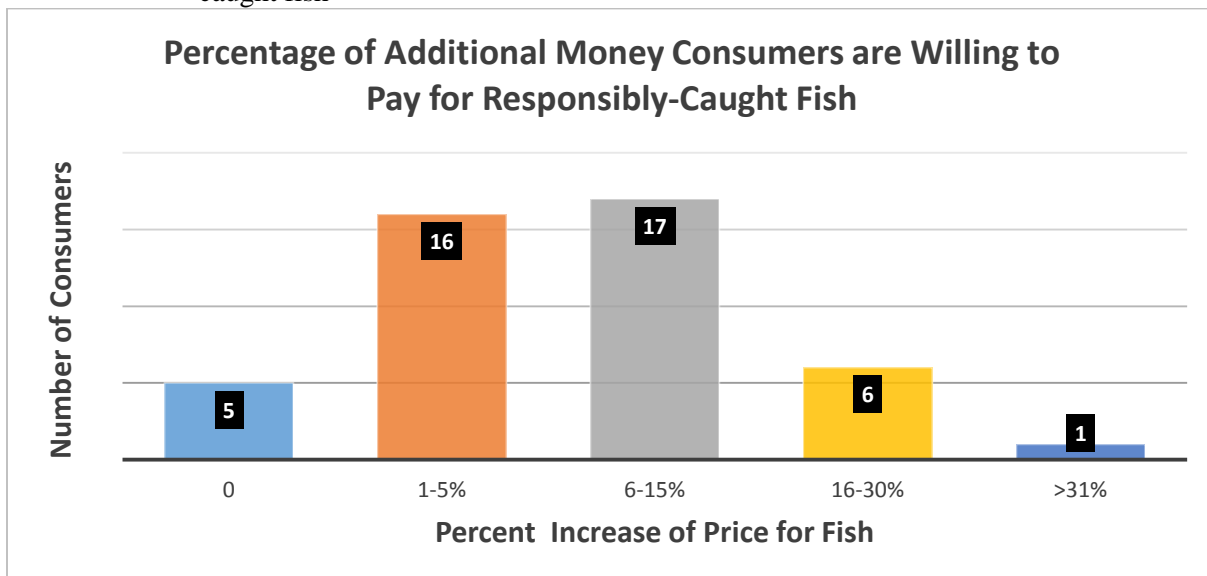
## Consumers are aware of the term responsibly-caught fish

- We asked if they had heard of the term “responsibly-caught fish” before.
  - 93% of the customers had heard of the term responsibly-caught fish, 7% had not heard of it



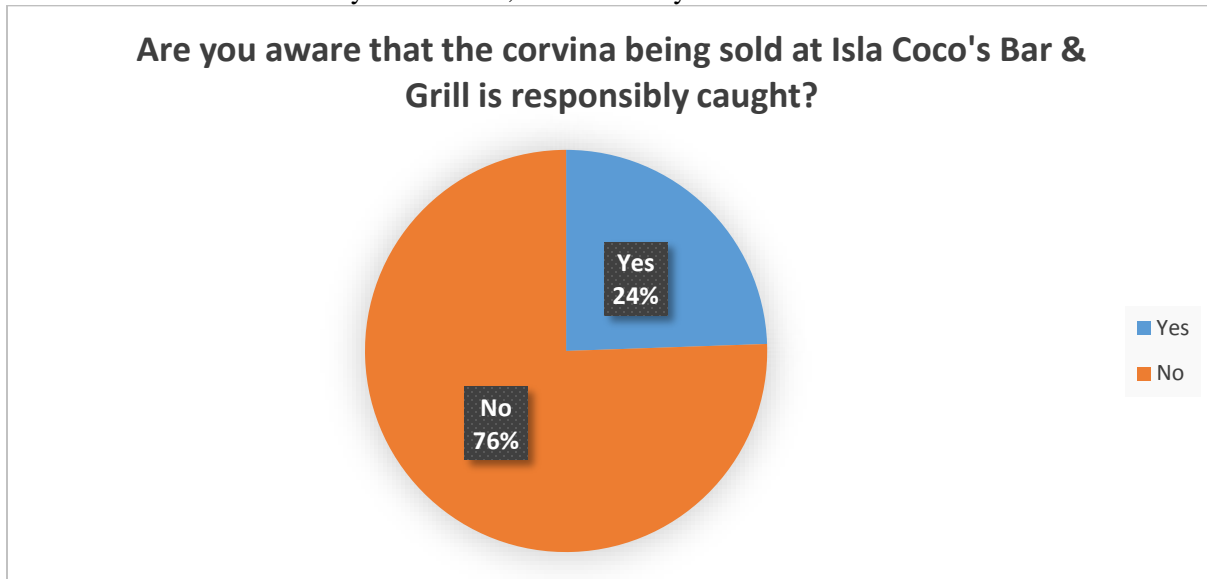
## Consumers are willing to pay more for responsibly-caught fish

- We asked how much more customers would be willing to pay for responsibly caught fish.
  - 11.1% are NOT willing to pay extra for responsibly-caught fish, 35.5% are willing to pay an additional 1%-5%, 37.85% would pay an additional 6%-15%, 13.3% would pay an additional 16%-30%, and 2.2% are willing to pay more than 31% more for responsibly-caught fish



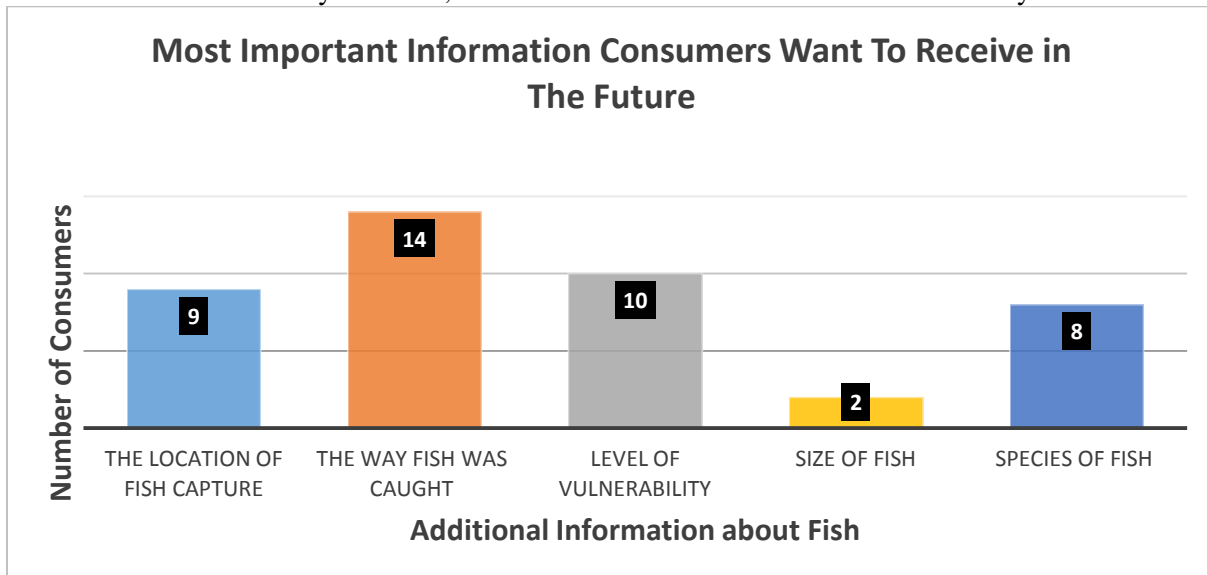
## Consumers were unaware that Isla Coco's serves responsibly-caught fish

- We asked if customers knew that Isla Coco's serves only responsibly-caught fish
  - 24% said they were aware, 76% said they were unaware of this



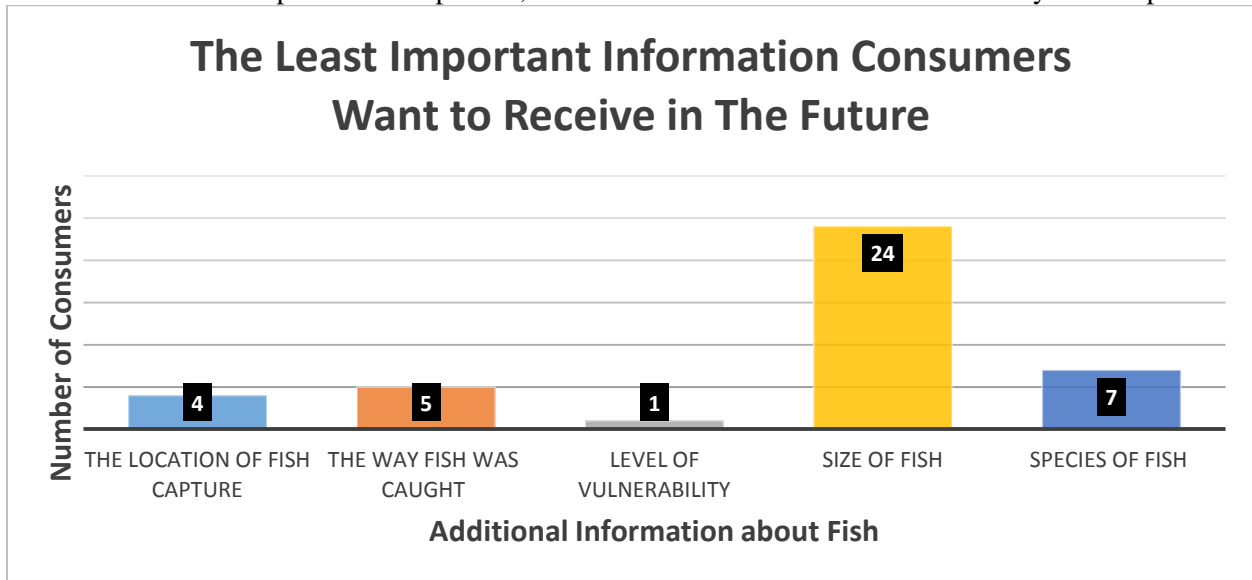
## Consumers are mostly interested in receiving information about the way the fish is being caught.

- We asked customers what additional information they would be most interested in receiving about the fish they buy and consume.
  - 32.6% of the consumers are interested in receiving additional information about the way the fish is being caught, 23.3% want to know about the level of vulnerability of the fish, 20.9% want to know the location of capture of the fish, 18.6% want to know the species of fish they consume, and 4.65% want to know the size of the fish they consume.



Consumers are least interested about receiving additional information regarding the size of the fish they consume.

- We asked customers what additional information they would be least interested in receiving about the fish they buy and consume.
  - 58.5% of the consumers consider the size of the fish the least important information to receive in the future, 17.1% consider the species of the fish least important, 12.2% consider the way the fish was captured least important, 9.8% consider the location of the fish capture least important, and 2.4% consider the level of vulnerability least important



## Conclusions

### Restaurants should increase advertisement of responsibly-caught fish

- We found from our surveys that consumers were interested in responsibly-caught fish, understood it has higher quality, and were willing to pay more for it.
- We also found that consumers lacked knowledge of responsible fishing and could not provide a concrete definition of the term.
- Additionally, we found that the majority of customers were not aware that Isla Coco's serves responsibly-caught fish.
- **We recommend that restaurants selling responsibly-caught fish should inform consumers about the responsibly-caught fish products being sold.**
- Restaurants can raise awareness and increase advertisement of responsibly-caught fish through a variety of means:
  - A note on the menu emphasizing the sale of responsibly-caught fish
  - Brochures given to customers to inform them of the benefits of responsible fishing
  - Placemats on tables with information about responsibly-caught fish
  - T-shirts worn by staff with a slogan or cartoon about responsibly-caught fish
  - Examples of these advertisement materials are shown in Appendix F.

## MarViva should conduct additional surveys in restaurants that do not sell responsibly-caught fish


- Because our research only covered consumers at a restaurant selling responsibly-caught fish, **we recommend that MarViva should collect data from people who have not been exposed to responsibly-caught fish and people in restaurants where responsibly-caught fish is not yet sold.**
- This data would provide greater insight into the consumers' awareness and willingness to buy responsibly-caught fish.
- For consistency, MarViva should use the same survey questions given to customers at Isla Coco's, which are shown in Appendix C.
  - MarViva could start by targeting consumers outside of Puntarenas, in order to cover a demographic with less proximity to the existing supply chain in Costa de Pájaros
  - The survey could be implemented by contacting restaurants via email or written letter, inviting them to conduct a survey to better understand their consumers
  - A MarViva representative would likely have to conduct the survey in person as opposed to having the restaurant conduct it, to ensure the validity of the results
  - After conducting multiple surveys, MarViva could even compile the results in a spreadsheet to create a database of consumer information that could be used to support existing and future supply chains



# Appendix E – Informational Pamphlet for Restaurants



MarViva Foundation, founded in 2002, is a regional, non-profit organization, with mission to impulse the conservation and sustainable use of marine and coastal resources in the Eastern Tropical Pacific, for biodiverse and healthy habitats and ecosystems, generating wellbeing for the present and future generations.



MarViva Foundation  
Bulevar Earnesto Rohrme  
San José, Costa Rica  
Phone: (506) 2290 3647  
Fax: (506) 2231 4429  
<http://www.marviva.net/>

## RESPONSIBLY CAUGHT FISH



### BE RESPONSIBLE AND FISH RESPONSIBLY

MarViva Foundation

### WHAT IS RESPONSIBLY CAUGHT FISH?

Responsibly caught fish is the product obtained from fishing responsibly. Responsible fishing takes into account the size and health of the fish, as well as the overall health of the entire ecosystem, by using methods that harvest only mature fish of certain species in controlled amounts. Fishing responsibly involves using selective methods such as hand-lines and long-lines with curved hooks, and gillnets with holes several inches larger than the legal minimum.



### RESPONSIBLE FISHING METHODS



Hand-lines



Long-lines



Gillnets

## GET HOOKED

### BENEFITS

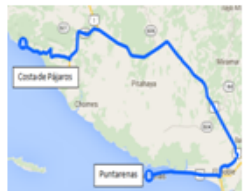
- High Quality
- Healthy Fish
- Environmental Protection

### THE SUPPLY CHAIN

The supply chain begins with artisanal fishers who use responsible methods to catch the fish. After the fishers get their catch, they bring it to receiving centers where the fish is inspected for quality. The receiving centers then sell the fish caught to corporate buyers, which include businesses such as restaurants, hotels, and supermarkets. From the corporate buyers, consumers purchase the fish to be eaten.


### CURRENT SUPPLY CHAIN

Currently, there is an established responsible fishing supply chain in Costa de Pájaros, Costa Rica. This supply chain has been working with the MarViva Foundation, a non-profit organization dedicated to the protection of marine resources, to ensure the fish is of the utmost quality. In this supply chain, fish are caught using responsible methods and sent to the receiving center Cama Pez de la Costa, where the fish are inspected, prepared, and sent to the restaurant Isla Coco's in Puntarenas.



### FUTURE SUPPLY CHAINS


Building off the success of the established responsible fishing supply chain, MarViva is looking to create a new, or prospective, one between Costa de Pájaros and Monteverde and additional supply chains in the future.




### JOIN TODAY

Interested in joining the responsible fishing supply chain? Contact us today!


### Step 1: Fishermen




### Step 2: Receiving Centers



### Step 3: Restaurants and Hotels

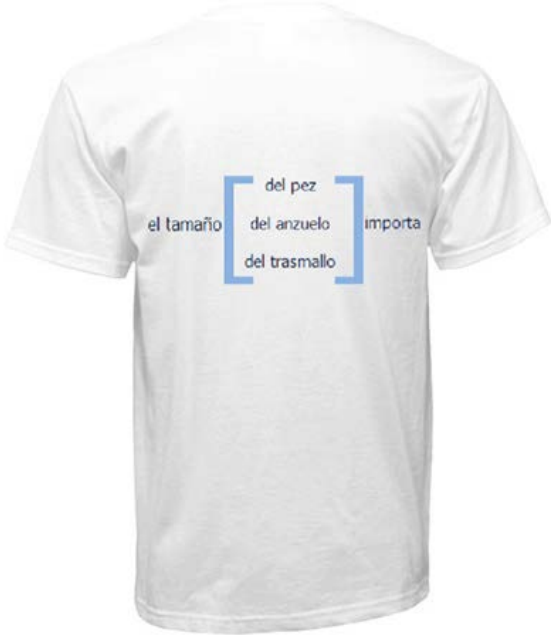


### Step 4: Consumers

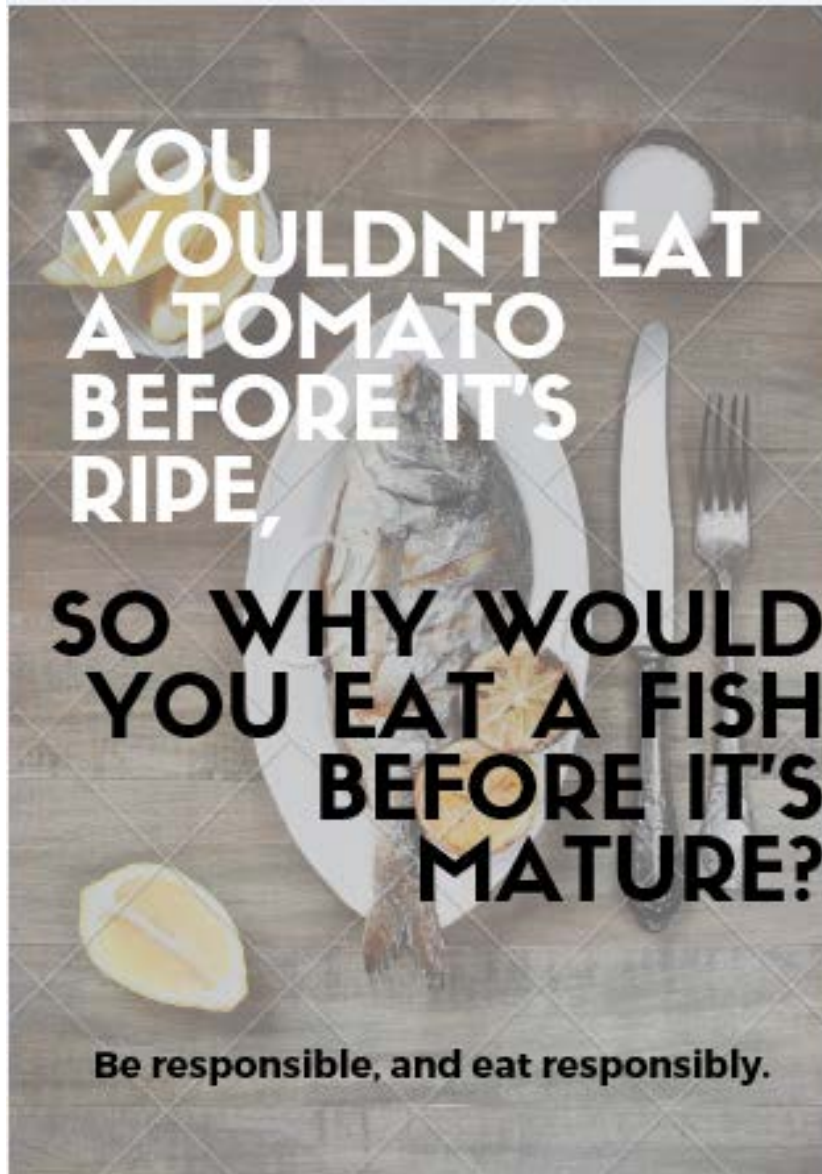


# Appendix F – Advertising Material for Consumers

## T-shirts



Advertisement Sign



**YOU  
WOULDN'T EAT  
A TOMATO  
BEFORE IT'S  
RIPE,**

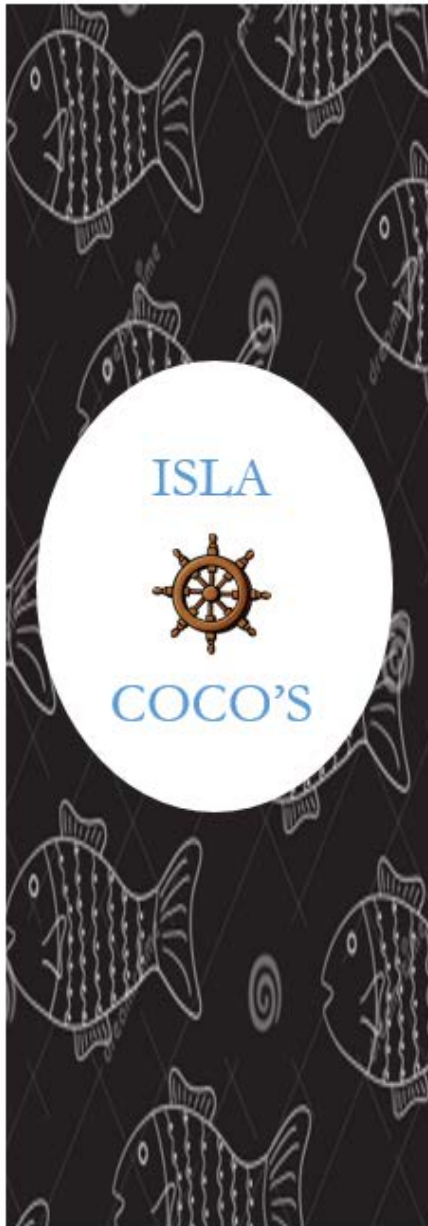
**SO WHY WOULD  
YOU EAT A FISH  
BEFORE IT'S  
MATURE?**

**Be responsible, and eat responsibly.**

## Menu

### MENU

\*All fish is responsibly-caught



Shrimp and French Fries

Rice with Shrimp

Seafood Soup

Sea bass with Rice and  
Vegetables

Fish Quesadillas

Fish Tacos

Garlic Shrimp

