

**You Control the Media, You Control the Masses; The Implementation of a Ban on Isla Mujeres, Mexico: The Intersection of Norms, Law, and Economy**

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**The Implementation of a Ban on Isla Mujeres, Mexico: The Intersection of Norms,  
Law, and Economy**

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## **ABSTRACT**

In the summer of 2018, I studied the impacts of Styrofoam on the island Isla Mujeres, Mexico and the barriers restaurants face with transitioning to biodegradable alternatives. My overall aim was to offer data and analytical support for creating government policies that lead towards the banning of Styrofoam on Isla Mujeres. A few months later, in October 2018, the state of Quintana Roo announced the ban of plastics and Styrofoam. From history, I have found that although legislation may pass laws, laws are not always followed by the general public. A law is only as powerful as the people who follow it. In other words, if a society does not acknowledge or obey a law, then it does not hold power over the people.

Therefore, I continued my research from last year by investigating how social norms of a community influences how successful a law will be implemented and enforced to gain a better understanding of intersectionality of norms, law, and the economy. I interviewed 40 participants who included, government officials, restaurant owners, residents, environmental activists, and store managers. In addition to my interviews, I surveyed 195 people including tourists, restaurant owners, residents, and store managers as well as conducted observations on the use of Styrofoam. Preliminary findings indicate that the main issue the government faces in effectively implementing the ban is rooted in the inability to communicate with its citizens and address their concerns to completely tackle the heavy use of Styrofoam on the island. These results will be shared with my participants and the municipality of Isla Mujeres as they continue to work on implementing the ban.

## INTRODUCTION

A law is only as powerful as the people who follow it. In other words, if a society does not acknowledge or obey a law, then the law does not hold power over the people. In some cases, members of society intentionally violate laws with impunity. Historically, legislatures have passed laws that were not always followed by the general public, and resistance to certain laws have greater consequences than other laws. For example, Emma Lou Thornbough discussed how civil law rights that stated full and equal accommodations to all persons were disregarded as Blacks patronized and barred from businesses (6). The lack of law compliance within any given society may be rooted in various factors. For example, a law may not enjoy sufficient popular support. Another reason is that people may not be aware that the law exists. In any case, the law is neither acknowledged or enforced.

This paper discerns why societies choose to obey and hold one another accountable for certain laws and not others by using the island of Isla Mujeres, Mexico and its implementation of a ban of single-use plastic and Styrofoam as a case study to further understand how social norms influences law adherence. The definition of *social norms* this paper focuses on is the standards that regulate and influence the behaviors and interactions of people. Although Michael Hechter and Karl-Dieter Opp explain legal norms and social norms as two distinct phenomena, the case study of Isla Mujeres demonstrates how these two notions overlap and, inevitably, influence one another. For instance, Hechter and Opp wrote how legal norms are created and written through processes and sanctions while social norms are impulsive and unwritten (11). However,

the processes by which the ban is written and implemented relies on the social norms of Isla Mujeres and its normative use single-use plastic.

Similarly, it has been found that local governments are critical to environmental regulations, because “local governments are often not afraid to take a creative and innovative approach to a difficult problem” in comparison to state governments (Reck, 134). For example, in the case of tobacco control in India, it was found that enforcing the law at a state level became the biggest issue, because a majority of the states did not monitor compliance with the policy allowing citizens to continue to use the product. Yet, when enforcement officials were trained and a grassroots educational campaign was integrated into the community, the country experienced a higher compliance with the policy and a decrease in tobacco use (Kaur, 2011). According to Jagdish, local governments are an essential element in the process of implementing a law, because it enforces laws more directly than the federal or state level. Why is this the case?

This paper investigates how local level implementation may enhance or undermine the compliance of single-use plastics, because although the ban was a state regulation of Quintana Roo, each municipality is responsible for enforcing the ban accordingly. For instance, the new law falls under the jurisdiction of Public Services of Isla Mujeres, because it regulates how to handle solid waste and how to maintain the cleanliness of the island. Therefore, this law is being implemented under the circumstances Kaur proposes for effectively implementing the ban, locally, as opposed to how it was implemented in India, or at state level. However, despite municipalities being included in the implementation of the ban, residents and restaurant owners

seemed adamant that they would not have to adhere to the ban on single-use plastics and Styrofoam due to the norms of apathy towards the environment, so I study how the local government may be able to address resistance more effectively than the state government.

Thus, this research aims to understand why citizens believe they will not be obligated to comply to the law before it is completely implemented and enforced by analyzing social norms of Isla Mujeres before the ban of single-use plastics and Styrofoam was announced in October 2018 and how these norms and attitudes shifted after the announcement within a 12-month timeframe. Understanding how to gain the compliance of *all* citizens to laws, particularly environmental regulations, is vital not only to sufficiently protect the environment but also to ensure the social order of a society where everyone is equally held accountable and penalized for resisting laws.

As this paper proceeds, it addresses the question of how the intersectionality of law, norms, and the economy impacts law compliance. I analyze how 1) policymakers plan to deal with unintended policies and unanticipated concerns of restaurant owners, 2) a shift in attitude towards a ban of Styrofoam which in turn causes tension between business owners and the tourist-based economy, 3) and, finally, how the residents of the island express skepticism in the government's ability to fully enforce the ban which, in turn, makes law compliance elusive. Understanding how to gain the support of the community and businesses for the new law banning single-use plastics is important, because non-compliance and resistance to this ban will lead to consequences that will harm the environment and the communities surrounding it, like Isla Mujeres. Also, using

Isla Mujeres as a case study for this research provides an example and framework for the necessary considerations to take into account when implementing future environmental regulations.

## **LITERATURE REVIEW**

The nature of a law announcement can, in some cases, predispose how citizens react and comply to a law. Robert Cooter explained the distinction between the legal forms as rules or standards when he wrote, “established legal boundaries based on the presence or absence of well specified triggered facts” while standards are boundaries decided within a court system since the facts are “too unpredictable to be cobbled into a rule” (25). He continues to expand on how rules which are not announced and enforced consistently transform into standards and require adjudication. In addition, when rules have varied exceptions and are rarely enforced, a grey area is constructed where the law is neither a rule nor a standard. In Isla Mujeres, citizens had varied impressions of the ban’s announcement, but a majority of them believed the ban would fall into the grey area in which there would be many exceptions made on how or when people would be penalized.

Anticipated resistance and noncompliance to a ban may be due to the problem that many governments, particularly state officials, face when they assume that formal means alone will motivate people to comply with a law (Cooter, 2). Because Cooter believes that social norms affect laws through “expression, internalization, and deterrence,” he argues that morality must be aligned with social control (3). In other words, how a law is announced, justified, enforced through the sanctioning of

wrongdoers must support the values of a given society. If a society does not value or prioritize a particular law, then it is less likely for people to comply and hold one another accountable.

For instance, environmental regulations have historically been regarded as less significant in terms of the justice system. In fact, Rob White argues “to change the criminal justice system as it stands will require a significant shift in general court attitudes towards environmental harms in the specific values attached to different types of environmental harm” (123). In other words, the penalties for disobeying laws under the sector of environmental laws have not been consistently enforced by the court system which reflects the value they place on these regulations. As a result, the overall society and community will not regard these laws in gravity without the enforcement of the government. Thus, if the government does not effectively and consistently sanction wrongdoers of the ban, then the community will not hold it as a vital law to comply to.

This then creates the question of what level of severity in penalties is needed to effectively influence the compliance of environmental laws. White argues that “directive legislation and active enforcement and prosecution” must be used to increase compliance. However, Eric Posner believes that people will comply to a law whether it is enforced or not, because they are conforming to social norms. Therefore, although legal scholars have recently begun to research the effect of social norms on laws, they have not fully understood how these ideas can be put into practice which this paper will use Isla Mujeres as a case study of how these ideas are practiced in the contemporary world.

For instance, social norms involve sanctions which are when citizens and non-governmental officials hold one another accountable socially. An example would be when members of a community refuse to support a business that uses animals for testing. This would be the case for Isla Mujeres enforcement of the ban, for it will be the responsibility of the people to denounce anyone using plastics to the Public Services. Therefore, the ban of Isla Mujeres will provide a case study to how social sanctions can be practiced as well as its direct effects on the law implementation and enforcement.

Furthermore, while there are existing bans on Styrofoam in countries such as India, the United States, Guyana, Barbados, and Trinidad. However, many face different challenges in effectively implementing the ban (Marshall 2017). For example, in Portland, Oregon, the paper alternatives that replace Styrofoam have created more waste and the major users of Styrofoam, such as schools and hospitals, were exempt from the ban (Rucker, 14). The research studying the Styrofoam ban in Portland found that the material replacing Styrofoam impacts how successful a ban is considered, because the paper replacement in Portland resulted in more litter and waste (Recker 2008). Again, determining whether the government will provide alternatives to Styrofoam before banning it completely will be a key part in the implementation and how receptive the community will be to it. When the government implemented the Tobacco Control Policy in India, it faced challenges because tobacco was accessible and cheaper than other products; this could happen in Isla Mujeres if people are not provided with alternatives (Kaur, 2011).

Similarly, this evidence suggests it has been found that local governments are critical of environmental regulations, because “local governments are often not afraid to take a creative and innovative approach to a difficult problem” (Reck, 134). In the case of tobacco control in India, it was found that enforcing the law at a state level became the biggest issue, because a majority of the states did not monitor compliance with the policy allowing citizens to continue to use the product. When enforcement officials were trained and a grassroot educational campaign was integrated into the community, the country experienced a higher compliance with the policy and decrease in tobacco use (Kaur 2011). Because the municipality, or local government, of Isla Mujeres is responsible for enforcing the ban of single-use plastics, this research investigates whether or not local governments can guarantee compliance or not.

## **BACKGROUND**

Styrofoam is a controversial material that takes up to a million years to break down and adversely affects marine and terrestrial ecosystems, organisms and human health. It has been banned in various cities and states in the United States and some countries are taking steps to eliminate Styrofoam at a national level, but it continues to be produced and distributed on a global scale. Isla Mujeres is a tourism destination located in the Caribbean Sea off the coast of Cancun, Mexico. Although this island of approximately 17,000 people sits in the heart of a vulnerable marine environment, the use of Styrofoam is common for many businesses and residents alike. During a beach cleanup, I could not take more than five steps before I encountered small pieces of plastic or a bottle cap. One resident explained that Styrofoam typically is statistically

underreported when beach cleanups take place on the beach or in the ocean, because it has already floated to sea, blown away, or broken into smaller pieces that people cannot see as easily as plastic items like straws, bags and bottles. Many residents and restaurant owners expressed their concerns about the heavy use of Styrofoam on the island. Initially, I believed that the cost of alternative products was the main concern for restaurant owners to transition away from plastic and Styrofoam. There was no store on the island that sold biodegradable products, so they had to travel across the Caribbean ocean to Cancun and drive another forty-five minutes to a store that offered these products then return back to the island.



Image 1. The plastic buildup from one of the beaches



Image 2. A store on the island that only sells plastic

However, in October 2018, the state of Quintana Roo announced that “The state of Congress intends to approve the bill to prohibit the use of straws, plastic, bags, and even Styrofoam.” They proposed that the ban and its regulations would be enforced by January 1, 2019. After learning about this new legislation, I questioned how it would be

implemented and would if the people of Isla Mujeres would react well (positively) to the new ban.

Yet, one of my participants from my project in the summer informed me in February that the ban still had not been enacted and the government had not announced any new information despite its announcement in October to implement in 2019. Therefore, I returned to Isla Mujeres to understand how the government planned to enact a law that would have a direct effect on its economy since a majority of the restaurants and stores on the island relied on plastic and Styrofoam products.

Moreover, given that it is an island, Isla Mujeres, Mexico is an ideal case study to study how law and social norms directly influence one another for three reasons. The first is that the state of Quintana Roo announced that the islands would have six months to implement the ban while the cities on the mainland, such as Cancun, would be given a year time period. Because Isla Mujeres was required to work in a short time frame, I was able to study many of the processes involved in policy making and implementation. The second reason is that the island uses plastic and Styrofoam more heavily than the mainland which the Head of Ecology explained is why they are given a shorter time period since “the problem is more severe on the islands,” which means it makes the use plastic more normative and common. Finally, although the ban is an environmental regulation, it directly affects the island’s tourist-based economy which allows me to study and gain a better understanding of the intersectionality between the economy, law, and social norms. Since the new law will directly affect restaurants and other businesses that primarily support this tourist-based economy, it is vital that the

government take into account the needs and concerns of these businesses when planning how it will implement the ban which this research focuses on.

## **METHODS**

Multiple methods were applied to collect and triangulate data on the widespread use of Styrofoam on Isla Mujeres. Margaret LeCompte and Jean Schensul define triangulation as “confirming or cross-checking the accuracy of data obtained from one source with data collected from different sources.” The data collected from one method was compared to other methods to confirm its accuracy. In order to corroborate my findings, I triangulated my methods with formal and informal interviews, surveys, and observations that provided my research with both quantitative and qualitative data. The research I began in the summer of 2018 provided the necessary background on the normative use of Styrofoam and anticipated resistance to the ban, so I was able to continue this research in the summer of 2019 as I studied the implementation of the new ban on single-use plastics. To understand the plans and perceptions of the ban, I interviewed 46 participants who included, governmental officials, restaurant owners, vendors, residents, environmental activists, and store managers.

In addition to my interviews, I surveyed 223 people including tourists, restaurant owners, residents, vendors, and store managers to gain an understanding on Styrofoam use and awareness of the ban. My interviews were in-depth and semi-structured that lasted from the range of twenty-five minutes to two hours. The interviews conducted with governmental officials, a translator was used to maintain my professionalism, because, although I speak Spanish, there are terms used in policy that I am not familiar

with and needed assistance to effectively express my ideas and questions. Finally, observations were used to analyze and study the behaviors of participants to gain a better understanding of how heavily people use Styrofoam and to verify that the behaviors they describe align with how they behave outside of formal interviews or a researcher's intervention.

### ***Location Justification***

I decided to use Isla Mujeres, Mexico as a case study for understanding how norms, law, and economy intersect through law implementation, because of Isla's location, tourist-based economy, and my background with the island. I conducted research in the summer of 2018 where I was able to gain an insight into how heavily Styrofoam was used on the island and how severe a ban on single-use plastics would be for many restaurants and businesses on Isla Mujeres. Since there were no alternative products sold on the island, a majority of businesses relied on the cheaper product of plastic since it had become commonly used across the island. Also, the government deemed all keys and islands of Quintana Roo as sensitive areas and limited them to only a six month period while other cities on the mainland were given a year time period to officially remove all single-use plastics from their area. This shorter time period allowed me to examine a larger portion of the procedures involved in implementing the ban of single-use plastics compared to if I examined the process in another city in the state of Quintana Roo, such as Cancun.

Finally, the ban will have a direct impact on the tourist-based economy since restaurants are one of the primary supporters to this economy. There is a strong tourist

community present on the island in which it is common for many tourists to return multiple times during one year. Also, there are thousands of day trippers that visit every day on Isla Mujeres. Therefore, many of the restaurants cater to this influx of people that sustain the island's economy. If these restaurants cannot efficiently transition to more expensive alternatives, then they will not be able to remain in business which will affect the very economy they helped support.

### ***In-Depth Interviews***

I conducted formal and informal interviews that were semi-structured and lasted from twenty-five minutes to three hours to understand 1) the structure of the ban, 2) perceptions of the ban, 3) the heavy use of Styrofoam, 4) and the anticipated problems of the ban's implementation. Also, these interviews were conducted to corroborate my findings with other methods, such as samples. For example, while a survey provides a quantitative analysis of how many restaurant owners understand the regulations of the ban, interviews provides a qualitative analysis of what regulations they are certain of and which ones they may not be aware of. Not only did interviews provide clarification to other findings, they also allowed me to explore other topics and ideas I may not have been aware of. Therefore, the interviews were used as a method to gain a deeper insight and complete picture of the different facets involved that surround the implementation of the ban.

All interviews were conducted in Spanish or English. Although Spanish is the national language of Mexico, many Islenos (people born and raised on the island) and restaurant owners spoke Spanish since they interacted with tourists on a daily basis.

However, I would conduct interviews in Spanish for Islenos who were not fluent in English such as vendors on the island.

The 49 interviews were with restaurant owners (n=20), vendors (n=15) store managers (n=3), environmental activists (n=2), government officials (n=2), and residents (n=7). All participants were twenty-five years old or older. Environmental activists provided information regarding the issue of Styrofoam and how prevalent and commonly used it is on the island. Interviews with residents allowed me to understand their perceptions of the ban to determine whether they would comply with the ban and hold others accountable. The interviews with government officials, vendors, store managers, and restaurant owners were the most vital to this project, because they allowed me to analyze and identify the gaps in communication in regards to how the ban would be implemented in contrast to how businessmen believed it would be implemented. Also, these interviews highlighted the concerns of restaurant owners and vendors that the government officials were not aware of or had not anticipated to take into account as they established the boundaries of the ban of single-use plastic.

Interviews with government officials were conducted with the departments of Ecology and Public Services in their respective offices, because they were the divisions of the municipality authorized to establish the parameters of the ban in terms of the implementation, enforcement, and sanctioning of wrongdoers. I used a translator for all interviews with government officials to maintain a professional environment and assure my ideas and questions were effectively expressed. The translator I used was a friend who I met in the summer of 2018, and she is a committed environmental activist and

advocate on the island who organizes events such as beach cleanups and Plogging (jogging and picking up garbage).

The interviews with vendors and restaurant owners were conducted at their places of businesses with the exception of one interview conducted at one owner's house. Restaurant owners are those who own a building for their restaurant businesses while vendors are those who own food businesses but sell their products from a cart or stand. Restaurant owners and vendors were selected based on their location but were randomly recruited meaning I would randomly approach and ask each owner to conduct an interview with them. There are three main neighborhoods on the island where many restaurants are situated. Hidalgo is the main industrial area, because it is closest to the port where tourists arrive and typically remain during their day trip or eat during their stay. La Gloria is the neighborhood where the restaurants are typically owned by Islenos and where many of them reside. Punta Sur is the furthest from the port but it is still an area where many tourists would travel to eat as they tour the island. Therefore, the restaurants downtown and Punta Sur are more oriented towards tourists while the restaurants in La Gloria are oriented towards locals.

The interviews with residents and environmental activists were conducted in their homes or at a public space such as a cafe. I recruited environmental activists through the beach cleanups I participated in, and I recruited residents through interactions with them at community parties or restaurants which are the common gathering places for residents in the afternoons and evenings. The demographics of residents are composed

of people who were born and raised on Isla Mujeres and those who have lived on the island for at least five years or more.

Interviews were conducted and structured in three parts. The first part involved meeting with government officials to gain an understanding of the structure of the and their plans to implement and enforce the ban. The second part was interviewing restaurant owners, vendors, and store managers to identify gaps in communication between the government and business owners. Also, these interviews focused on the perceptions and attitudes toward the ban and compliance with the new law. The last part involved interviews with environmental activists and residents to identify remaining plastic issues on the island and the attitudes towards the ban from people whose income will not directly be affected by the new ban.

### ***Surveys***

I conducted one random sampling and three different surveys. The random sampling was conducted in the summer of 2018 and the summer of 2019. The random sampling conducted the summer of 2018 to corroborate the information provided from participant observations about the heavy use of Styrofoam by restaurants, a sample survey of restaurants was conducted in two main areas of the island—downtown and La Gloria. A sample survey occurs when a fraction of a total population is surveyed, so the fraction becomes the representative unit of the total population (LeCompte & Schensul 1999). Twenty restaurants were surveyed as part of this research. The sample survey were broken up into three stages that involved going to twenty different restaurants downtown and in La Gloria to determine how many, if any, used Styrofoam. Each

restaurant visited was asked if it provided Styrofoam carry-out or cups at their bar. The first samples (n=6) took place along the main road downtown which consists of the restaurants along the beach-front of the island where daytrippers predominantly gather. The second set of samples (n=8) were conducted on Hidalgo, a pedestrian walkway filled with restaurants. The third set of samples (n=6) were conducted in La Gloria, an area where Islenos and residents typically gather as opposed to tourists.

The random sample survey conducted in the summer of 2019 demonstrated the difference of Styrofoam and plastic use of restaurants after the ban announced in comparison to the sample in 2018 before the ban was announced by the government.

The first survey was used to gain an understanding of tourists' perspectives on environmental issues and the use of Styrofoam on the island. These surveys were conducted in person and also posted on three Facebook pages designed specifically for regular tourists to Isla Mujeres and require permission to be admitted into these pages. Of the 163 respondents, twenty were in person and one hundred forty-two were online. For in person surveys, tourists were approached in the main tourism zone of downtown Isla Mujeres and asked to participate. They were either given a phone that was connected to the electronic version or paper copy of the survey depending on whether there was internet access or not. Although there are tourists who speak other languages outside of Spanish and English, like Portuguese, I did not interview them due to language barriers. However, I believe that I was still able to gain an insight of tourists' perceptions since the majority of tourists are Spanish and English speaking.

The second survey was focused on vendors (n=20) and restaurant owners (n=20) to gain an overall analysis of their concerns, awareness, needs concerning the ban. The restaurants and vendors were surveyed from the three areas of downtown (Hidalgo), La Gloria, and Punta Sur. The survey identified the most effective way for the government to announce updates of the ban as well as the preference of communicating the guidelines of the ban to business owners. Also, the survey provided new ideas to probe during interviews that concern how well owners understand the established rules for removing their single-use plastic products and whether or not they know where to purchase alternative products that are cost-efficient. Finally, the survey identified the current conditions and differences in communication between the government, vendors, and restaurant owners such as if the government has provided information them with information about the ban or not.

### ***Observations***

I conducted unobtrusive and participant observations to corroborate findings in surveys and interviews as well as to gain insight on the issue of single-use plastics on Isla Mujeres. An unobtrusive observation occurs when data is gathered by means in which direct elicitation of information from subjects of study are not involved (Lee 2000, 1). In other words, the researcher sits passively and records the activities of subjects, allowing subjects to behave in a normal manner without being disturbed by observer. Unobtrusive observations were conducted to observe how often locals use Styrofoam. They were done at a local store that is known as a key place to purchase Styrofoam for locals and restaurant owners. Although the customers were not aware of the

observations, the staff of the store were aware, for their permission was given to allow the observations to take place. A few days prior to the observations, one of the workers at the store explained that the majority of the people who came into the store bought Styrofoam throughout the day. When asked if she knew whether these people were restaurant owners or not, she confirmed that locals and owners came to purchase Styrofoam at this store.

Participant observations occur when the researcher participates in the activities of the group under study (SCERT 2015, 21). It is an ethnographic research method that aims to familiarize the audience with a general research problem (De Munck & Sobo 1998). The participant observations for this research took place in 1) beach clean ups and 2) ordering carry-out at restaurants, 3) Elige Bio selling. The first participation observation took place in beach cleanups in which I gained first hand experience on how tedious the task is and witnessed the large quantities of single-use plastics that cover the shorelines and beaches near the ocean. The second participation observation occurred while eating at restaurants and asking for carryout. These observations shed light on how often Styrofoam was given to customers by restaurants as carryout. For the third observation, I participated in promoting biodegradable products from Elige Bio-the only biodegradable store on the island that was created after the ban was announced in 2018. During this observation, I was able to identify the qualities of biodegradable products restaurant owners preferred as well as the products they needed for their businesses and how they began their transition process from single-use plastics.

## ***Method Analysis***

All interviews were recorded and transcribed after receiving consent from each participant. In the surveys, interviews, and observations, identities are de-identified and pseudonyms were only used in all formats of data such as field notes and interview coding. The software NVivo is used to code and analyze the transcripts, surveys, and observations.

## **RESULTS**

This section will provide the findings of the 40 interviews and 2 surveys regarding attitudes toward Styrofoam and the implementation of the ban of plastics and Styrofoam in Isla Mujeres, Mexico. I will first identify the heavy use of Styrofoam and attitudes toward a ban in the summer of 2018 before the government of Quintana Roo announced the ban of Styrofoam and plastics in October 2018. Second, I will analyze how attitudes and the use of Styrofoam has shifted after the ban was announced. Finally, I will identify the problems with the implementation of the ban and how social norms create these problems.

### ***Styrofoam Use in 2018***

Isla Mujeres is a beautiful island off the coast of Cancun, Mexico that attracts about two million tourists each year. From the beautiful sunsets at Playa Norte to the exciting diving site of Manchones Reef, Isla Mujeres is a place that gains its attractions from its captivating marine life and ecosystems. As in most other countries in the region, Styrofoam is heavily used here. In the summer of 2018, although Styrofoam had not yet been banned, the residents of Isla Mujeres were already taking steps to clean their

island and educate their community about environmental issues. For example, Accion Isla, a local environmental organization, organized several events such as environmental fairs, beach cleanups, and Plogging (running and picking up garbage) to promote environmental protection. Also, during a formal interview, a man explained that he had been cleaning beaches by himself since he arrived on the island twenty years ago and estimated that he cleans up a ton of garbage per year. Additionally, the government of Isla Mujeres has worked to clean up the island. It has organized teams to clean the streets every two weeks to prevent garbage from reaching the oceans and has placed recycling bins on beaches.

However, despite these efforts to clean the island and prevent pollution, the heavy use of Styrofoam and plastic within Isla Mujeres remained a significant challenge. Discarded Styrofoam floats into the oceans or becomes trapped in the mangroves on Isla. During an informal interview, one resident explained that Styrofoam typically is statistically underreported when beach cleanups take place on the beach or in the ocean, because it has already floated to sea, blown away, or broken into smaller pieces that people cannot see as easily as plastic items like straws, bags and bottles. In contrast, there is a large amount of Styrofoam from the mangrove cleanups, because it gets trapped in between the roots of the trees. For instance, in the cleanup done on the beach, there were no pieces of Styrofoam and thirty-four pieces of plastic. However, in the mangrove cleanup there were forty-four pieces of Styrofoam and one hundred thirty-six pieces of plastic. Similarly, another resident stated, "I find Styrofoam all the time. It's hard to find it here, because it's the same color as the shells and stuff like that.

It's all broken pieces. But once you start picking up Styrofoam, you see them. Because plastic caps and stuff like that is easier, because its always different colors like red and blue."

The amount of Styrofoam polluting the oceans and mangroves is one testament of how heavily Styrofoam is used on the island. The question then becomes, "How does the Styrofoam get into the ocean?" Styrofoam is distributed frequently on the island, particularly by restaurants. As one resident stated, "Almost every restaurant uses Styrofoam. They give customers a Styrofoam cup with a plastic lid, sauces in plastic bags, and plastic utensils just to put into a Styrofoam container." This garbage does not always reach the landfills on the mainland, because some tourists and locals litter along the streets of the island. During a formal interview, a woman who has lived on the island for eleven years described, "I would be driving on my motor and watch tourists throw their bottles and Styrofoam cups along the street." Another local explained, "I drive in my moto and see a family on moto. They will just throw the bottles on the ground right in front of me. They do not care." In addition to littering, garbage trucks are known to drop garbage throughout the island, because they do not have tarp coverings. As a result, garbage flies out every time the trucks turn a corner, which ends up in the oceans and mangroves.

Furthermore, I conducted observations to study how often locals use Styrofoam at a local store on the island that is known as a key place to purchase Styrofoam for locals and restaurant owners. Although , the staff of the store were aware of my research after I gained their permission to make observations, the customers did not

have any knowledge of my research. A few days prior to the observations, one of the workers at the store explained that the majority of the people who came into the store bought Styrofoam throughout the day, but people typically bought more Styrofoam between the hours of 8 AM and 12 PM. Therefore, the observations took place for two hours between 8:30AM and 10:30AM. During these two hours, a total of 26 people purchased Styrofoam (Table 1).

Time	# people who bought Styrofoam	# people who did not buy Styrofoam
8:30 AM-9:00AM	6	14
9:00 AM-9:30 AM	7	24
9:30 AM-10:00 AM	6	21
10:00 AM-10:30 AM	3	16

**Table 1-The results of the direct observations comparing how many people buy Styrofoam to how many people do not**

Moreover, the greatest producers of plastic and Styrofoam waste are restaurants, because the thousands of tourists that arrive on the island each day spend the majority of their time at these places. For example, Anthony is the owner of a bar and restaurant downtown that has been open for nine years, and he estimates that his restaurant fills at least 50 carryout orders per day. Similarly, Greg, the general manager of a bar near downtown explained that, “only Styrofoam cups are given to customers unless they ask

for a glass. Every time a customer orders another drink, he or she will be given a new Styrofoam cup.” As a result, restaurants shared different perspectives on whether they would transition from plastic to biodegradable products and how successful a ban on plastic would be on the island.

*Participant Observation: Beach Clean-up*

While walking down to the beach, one notices the litter of small pieces of plastic and bottle caps. It was not possible to take more than three steps before one would have to bend down and pick up another piece of garbage. Although the beach clean-up took place at eight o'clock in the morning, the sun was beaming down on everyone. The cleanup was tedious and frustrating, because the plastic pieces crumbled into smaller pieces when people tried to pick them up. There were many instances when people could not distinguish between a piece of plastic and a piece of shell or coral that belonged on the beach, because some natural materials looked similar to plastic. This attests to how animals cannot distinguish these same pieces in the ocean and consume them as a result. By the end of the clean-up the contents of one bag of trash included bottle caps, fishing mesh, doll's arm, plastic bottles, straws, three shoes, and fifteen pieces of Styrofoam. This was all found within one area on the beach. Participation in the beach cleanup indicates that Styrofoam is a clear environmental concern for the island.

*Participant Observation: Restaurant Observation*

The second participation observation occurred while eating at restaurants and asking for carryout. These observations shed light on how often Styrofoam was given to

customers by restaurants as carryout. For instance, each time a friend would ask for carry-out during a group dinner, he or she was given a Styrofoam container. One friend had only one small enchilada left that she wanted to take home. It was assumed that they would wrap it in a paper bag, but, instead, they placed it on a Styrofoam tray with Saran wrap covering it. Out of twenty restaurants observed, sixteen of them provided Styrofoam carryout. These observations made it evident that the restaurants' produced a high distribution of Styrofoam.

### ***2018 Restaurant Perceptions of Transitioning to Biodegradable Products***

Formal interviews were used to gain insights on the barriers restaurant owners face when attempting to remove Styrofoam from their businesses. Interviews were conducted with owners who use Styrofoam and those who use biodegradable material, and the account of the following four interviews with restaurant owners represent the perspectives of two businesses with biodegradable products and two with Styrofoam products.

#### ***Anthony***

Anthony is the owner of a bar and restaurant downtown that has been open for nine years. He estimates that his restaurant fills at least 50 carryout orders per day. As he explained the supply of take out, he stated, "So we do a lot of takeout. The big problem is that I don't have a secure supply of takeout stuff. We don't have a lot of space for storage, so we buy weekly. So we buy what we're going to need for the week." Anthony explained that his main concern is the accessibility of the biodegradable products, because his restaurant needs to replenish their stock weekly due to small storage space. Anthony then suggested a possible solution to his concern when he stated, "If there was a storage on this island that we could get (biodegradable) from and

we can make a phone call and have it delivered, because ever product I have more or less I go to Cancun once a week, and I do shopping in Costco only. If someone was on the island selling this stuff and they delivered, I'd buy it no problem. I wouldn't even think about it." In other words, the cost was not a main concern for Anthony; the convenience and accessibility of the product is the concern. He described how every owner he knows, including himself, buys Styrofoam on the island. If the products were being sold on the island, then he would not hesitate to use those products instead of Styrofoam.

### *Sam*

Sam is the general manager of a bar near downtown. At his bar, only Styrofoam cups are given to customers unless they ask for a glass. Every time a customer orders another drink, he or she will be given a new Styrofoam cup. When asked about his perspectives on Styrofoam, Sam stated, "I hate it. I want to do away with straws and Styrofoam. I would love to see Styrofoam banned. I think it would be great." This comment was interesting, because the owner of the bar has made it known that he is not interested in finding other products to use. Sam explained how Styrofoam is a clear issue on the island, because there are piles of it along streets. He is currently working on finding a way to convince his boss, but he needs the perfect alternative.

Although Anthony emphasized the concern of accessibility, Sam emphasized the concern of cost and functionality. Sam explained that the alternative cannot be too expensive and has to be able to keep drinks cold since ice melts fast on Isla Mujeres. Also, he mentioned that people have never questioned their use for Styrofoam. If more customers brought up the issue, then the boss may be forced to look at alternatives.

### *Selena*

Selena has lived on the island for fifteen years and owned restaurants here for 14 years. She has owned a total of three restaurants during her time on the island, but now she has just one. In contrast to Anthony and Sam's restaurants, Selena's restaurant uses biodegradable products. She has been known on the island for beginning a straw campaign in which her restaurant only has biodegradable straws and tries not to give away straws unless customers ask for them. She emphasized the importance of having her own restaurant, because, in the past, her partners were not willing to spend the money on the biodegradable products.

Also, Selena discussed how it was more difficult in the past to only purchase biodegradables, when she stated, "The first time I ever used recyclable containers, I think it was five years ago. It was too hard at that time. I could get one size and when it was out, it took one or two months to get in again. So they weren't realizable, but now it seems that they're more reliable." Currently, she uses biodegradable straws that can be reused for up to three months and plans to sell metal straws as well. She explained that she always tells her customers that they are trying to push it so that everywhere on the island will not give plastic straws.

Moreover, Selena provided some challenges that may arise during this research when she stated, "The issue and problem is going to be to convince the smaller restaurants on the island and perhaps some of the local people that first of all the problem of Styrofoam and to actually put that charge for their price for takeaway. That's what we're going to do. We're going to be purchasing them and charging like 15 pesos extra for takeaway which will pay for our to-go containers, because they aren't cheap." Selena outlines that it may become challenging to convince smaller restaurants to charge their customers extra for takeout, but she plans to do so in order to afford the biodegradable products. Therefore, for some restaurants it may be a cost issue which

means they need to be convinced that they can afford it as well as see a price comparison of the cost of Styrofoam on the island to the cost of biodegradable materials.

### *Ivan*

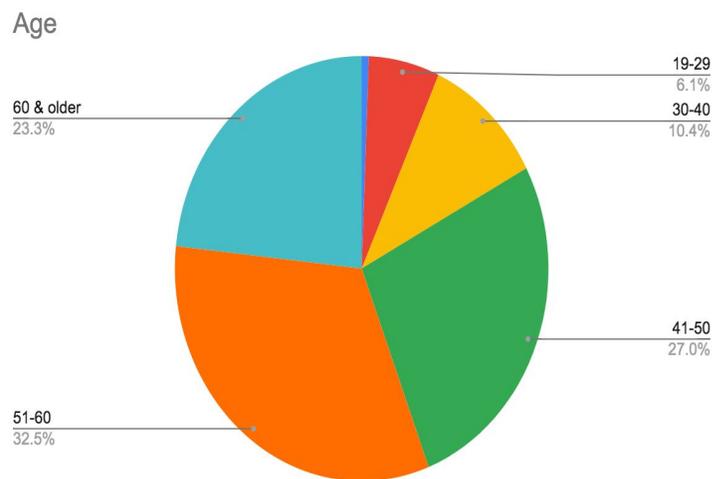
Ivan has a bar and restaurant downtown that has been open for three months. Similar to Sam's restaurant, Ivan's restaurant uses avocado straws that are one hundred percent biodegradable and takes one hundred eighty days to degrade. Ivan bought the avocado straws before opening his restaurant, because he knew that he had always wanted to implement biodegradable products. He explained that his bartender's girlfriend worked for the biodegradable company, so they were able to access the products easily. His restaurant uses two hundred fifty to three hundred straws per day for cocktails, because they only give straws for cocktail drinks and cut straws in half for margaritas. When asked how customers have reacted to his choice of biodegradable products he stated, "We let customers know its biodegradable, and people, sometimes, take the straws with them. People talk about it and promote our restaurant without us even asking them to." Interestingly, his restaurant does not charge extra for straws, because his business can afford these products without the extra charge.

### ***Tourist Perceptions***

The interviews indicated that the cost of biodegradable products is a concern of owners. As Selena suggested, owners can charge customers a few extra pesos for carryout. However, if customers do not agree with this new policy, then restaurants may lose service. A survey was used to gain an understanding of tourists' perspectives on environmental issues and the use of Styrofoam on the island. Surveys determine

variation in attitudes, knowledge, perceptions, demographic information, and behavior of study of population (LeCompte & Schensul 1999; 128.).

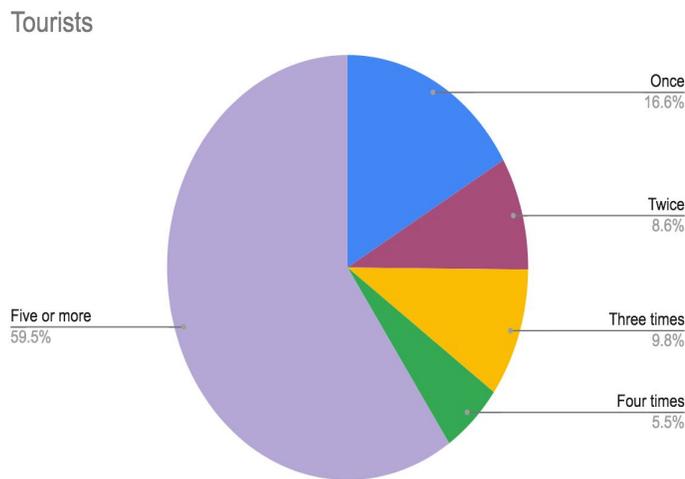
Of the 163 participants, 32.5% were 51 to 60 sixty years old; 27% were 41 to 50 years; 23.3% were 60 years old or older; 10.4% were 30 to 40 years old; 6.1% were 19 to 29 years old; and 0.6% were 18 years old or younger (Figure 1). The tourists forty-years old and older dominated. This may be due to the social media platform used to post the survey. Because there is not a designated page for tourists on Isla Mujeres on other social media platforms, Facebook was the only social media used, and the under-thirty crowd tends to use other social media platforms, such as Twitter and Instagram. Also, the majority of tourists who responded to the survey are frequent visitors to the island, and 59.3% having been to island five times or more (Figure 2).



**Figure 1.** Age of tourist respondents varied from 18 years old to over 60 years. A majority of respondents were forty years old or older.

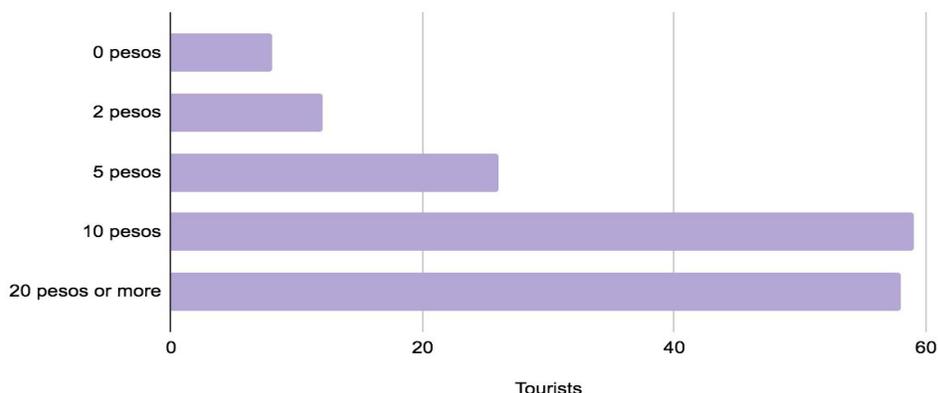
It was found that 135 out of 162 (83.3%) rated environmental concerns to be very important to them. This data shows that the group of tourists which Isla Mujeres attracts are very concerned about the environment.

Nevertheless, when asked, “If a restaurant required me to pay extra for biodegradable carry-out, I am willing to pay,” fifty-five people (34%) answered 20 pesos or more and fifty-eight people (36%) answered 10 pesos (Figure 3). This is important, because if cost is a concern for restaurant owners, then this data proves that a majority of tourists would be willing to pay extra, even up to 20 pesos, if restaurants transitioned to biodegradable carry-out products. By charging customers extra for carry-out, restaurants will have the ability to compensate for the deficit they may experience when purchasing biodegradable products that are a few pesos more expensive than Styrofoam.



**Figure 2.** Frequency of visiting Isla Mujeres varied among tourist respondents but the majority has visited five or more times

### Amount Tourists are Willing to Pay Extra for Biodegradable Carryout



**Figure 3.** This diagram shows that out of 162 tourists, 55 people (34%) will pay 20 pesos or more; 58 people (34%) will pay 10 pesos; 26 people (16%) will pay 5 pesos; 12 people (7.4%); and 8 people (4.9%) will not pay extra pesos if restaurants used biodegradable products.

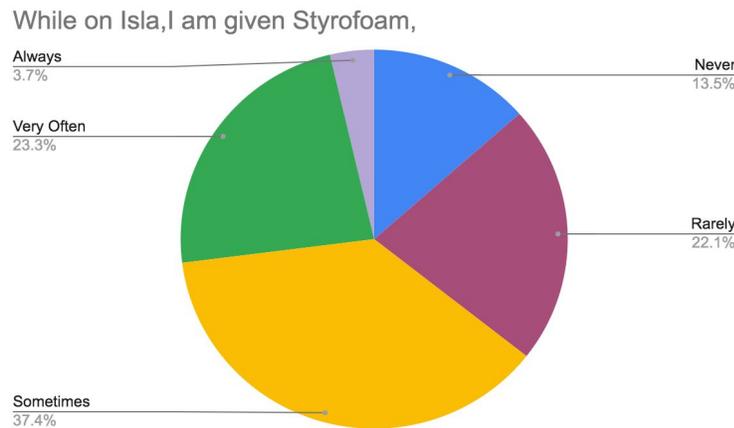
Similarly, the data collected from the survey shows that 82.6% of tourists would like to see Styrofoam banned from the island. Many of the comments posted at the end of the survey stated:

*“It should be prohibited it is detrimental to the environment.”*

*“Please get rid of it”*

*“I like carry-out, but I DON’T WANT STYROFOAM!”*

Therefore, tourists prefer that restaurants do not use Styrofoam, because they are aware of how harmful it is to the environment. This is important, because the island is very conscious about keeping tourists satisfied since its economy relies on the tourism industry. Also, when asked how often they received Styrofoam while on the island, 37.4% (n=61) of tourists reported sometimes and 23.4% (n=38) tourists reported that they receive Styrofoam very often (Figure 4). It is important to keep in mind that there were respondents who are daytrippers, so they may account for never receiving Styrofoam if they had a brief visit.



**Figure 4.** This diagram indicates a variation in how often tourists receive Styrofoam during their visits with 22.1% (36) rarely receiving; 13.5% (22) never; 37.4% (61) sometimes; 3.7% (6) always; and 23.4% (38) very often.

### **2018 Perceptions on Isla Mujeres Prior to Government Announcement**

Before the ban of single-use plastics was announced in October of 2018, restaurant owners and residents shared their perceptions on how well a ban of Styrofoam would be enforced on Isla Mujeres and whether people would comply. A few owners and store managers were in favor of ban, and believed it was the only way to successfully get rid of Styrofoam on the island. For instance, a manager of a restaurant with Styrofoam products, explained his support for a ban when he stated during an interview:

*If they may have imposed a rule tomorrow that everyone on the island had to sell recyclable and reusable, then everybody would be exactly in the same boat. We'd all have to purchase this. We'd all have to incur bigger costs, more costs. We would all raise our prices at the same time to reflect the change in the market. So there would be no winners and no losers. So that's another option, I would assume that on a small island like this if you could go to the president of the island and say 'hey there is an alternative way. Yes, its more expensive, but its available. We have 8 hour driver system where you can order at anytime; its gonna be there in an hour or two. And so there's no reason for anybody to say they can't get it because we're here to give it to you.*

However, the manager explained the prerequisites that would need to be set in place before the government imposes a law on the island. He identified the needs of restaurant owners that the government would need to address when he stated:

*And if you impose a ban on Styrofoam right now, we could supply everybody's needs and, yes there's a cost increase for everybody, but everybody encouraged it so it's not going to hurt anybody. It's not a competitive disadvantage. Everybody is affected by it." But, again, there needs to be a steady supply like its Coca-Cola, like it's like beef, like it's like fish. There needs to be a steady supply that comes to me, because we can't go chasing every product.*

Similarly, a restaurant owner from La Gloria proposed that the best way to remove Styrofoam from the island would be to "find another material that is similar to Styrofoam. Its function. It has to be able to keep the drinks cold, because it's really hot here and Styrofoam keeps the ice chill. The focus has to be on finding an alternative." The general manager of a restaurant who uses plastic described how the owner refuses to transition to an environmentally-friendly product. However, he believed if he can find an alternative that shares a few qualities with Styrofoam then he may be able to convince his employer. Another restaurant owner who used Styrofoam products on Hidalgo proposed an idea for how the government could hold tourists accountable for a possible ban, because he explained earlier in the interview that the cooperation of tourists would play a vital role in the success of the ban. He proposed:

*If they were to ban it all, they could easily put up a sign on both sides of the ferry port saying "Please support our environmental efforts, we don't want plastics and stuff like that and we appreciate you as well when you're going to the beach.." something like that. So you can do them at the ferry port, you can get to them coming onto the island, and you can get to them through Facebook. And these aren't very expensive campaigns either. Again, you want to be passive, you don't need to have people going around and handing stuff out. You just have to make it so that everyone is aware, and there's a one time cost maybe for putting up a*

*sign here and there or around the island. A little awareness campaign, is also good publicity for the island. We all win.*

In contrast, there were other owners who expressed their skepticism that people would comply and explained they would resist the ban by not removing their Styrofoam products. For instance, an owner near downtown was adamant about never removing Styrofoam from his business during a formal interview when he exclaimed, “I don’t care. I will never get rid of it. Who cares about the environment stuff. It’s cheap and works.” A resident explained that a ban would not be successful on Isla due to the norms of corruption on the island as he explained, “There is a lot of corruption here. A lot of corruption. There is corruption with the government and if you have money then they will not look. You can go to a restaurant and see the plastic, then say give me money and I will not see.” Similarly, an owner in La Gloria stated, “It starts with us. The people will keep paying and not seeing. They know they can keep paying the government and still use plastics.” It is important to recognize that those who were opposed to a ban on Styrofoam seemed to reject the ban more to their perceptions that it would be infeasible rather than rejecting it for the cause of protecting the environment.

### ***Plans for the Implementation of the Ban of Single-Use Plastics***

Although the ban on single-use plastic is a state regulation of Quintana Roo, the 125 municipalities are responsible for deciding the enforcement and regulation of the ban. Therefore, the government officials of Isla Mujeres have the authorization to implement the ban in the best way they see fit for the island and can differ from how another city, such as Tulum, regulates it. With the official law the use of plastic materials and utensils such as straws, plates, glasses, cups, trays, cutlery, among others and

derivatives of Styrofoam are prohibited in the state of Quintana Roo. The only exemptions from the prohibition are “the equipment and materials used for construction industry, goods packaging and products used for medical purposes” (“Aprueba Congreso Nuevo”). Plastic products must be removed in six months in the exclusion zones that include islands, keys, and vulnerable areas such as Isla Mujeres while the rest of the state has 12 months to enforce the prohibition. The 6-month probation period begins 30 days after it is published in the official newspaper for public knowledge. The official announcement was published on May 31, 2019 which means the 6-month period began July 1, 2019.

#### *Plans of Enforcement*

To understand the plans of the municipality of Isla Mujeres, I interviewed officials from the Ecology and Public Services departments since the prohibition is under their jurisdiction. When discussing how they propose to enforce the ban of single-use plastics, the Ecology Department explained, “The first people who should be brought together to talk about this are the restaurant and hotel owners, because they’re the ones who generate the most waste. And they have to be a part of how it gets solved.” He continued to explain how much waste they produce when he stated:

*All the islands have to do it in 6 months. Because the problem on the island with plastics is stronger than the other cities that are not islands. We have more people arriving as day trippers than we actually have residents on the island, and so the amount of plastic and waste goes up. A lot of times when we talk about plastic or waste a lot of times people talk about how “Aw the locals are so messy. All the locals are so dirty (\*he laughs). The truth is even if the local may not be as well educated about where to put their trash and they might leave on the street or whatever. Most locals, even if they wanted to-even if they wanted to make a full bag of trash here, they don’t have the money to buy enough things to throw away a full bag of trash. Like you have to buy the things to put in the trash*

*bag first. Right? But restaurants and hotels put 25, 26, 30 bags of trash every night. So they're the ones that produce the most. When the Pundicos, they keep like a tally of the trash, and in low season its 35 tons a day and in high season there's 60 tons a day. So its very clear that more tourists definitely and absolutely cause a pile of trash.*

One problem he expressed that he has encountered with discussing the ban with owners is that he cannot determine how to meet with them. He has set up meetings in the past with owners to educate them on waste management, and only two were present. However, he emphasized during the interview that the government main focus on implementing the ban would be through restaurants and hotels.

Furthermore, the sanctioning of the prohibition falls under the jurisdiction of Public Services. During the interview the Public Services official, he explained how the department does not have a sufficient amount of employees to inspect which businesses are complying with the prohibition. He described how the sanctioning will rely on the community of the island to hold one another accountable to law when he stated:

*If we catch them in flagrant. If we catch them like using plastics in that moment, then they can place the fine directly, if not there has to be an ordinance. And the fines, they're gonna be sure exactly how much the fine because it will depend on each case. But fines are based on UNAS-all capitals- and they're the unit of something. It's based on what minimum wage is. So every fine is 20,000 UNAS or 13 UNAS or 300 UNAS. The UNA changes every year, but it's based on what the minimum wage is so people are able to pay it off. It used to be a unit of minimum daily wage, but now it's more adjusted so that its more fair for people who do not have that much money and more for the people who do have more money. I think it's based on the municipal so the region.*

Also, both departments emphasized the municipality as well as the state pushes for companies and businesses to replace their plastic products with biodegradable alternatives. As a result, they plan to end the commercialization of the material on the

island, meaning that all the stores that only sell plastic will be required to work with biodegradable companies. The official of Ecology stated, “The only single use items that they should be legally able to sell once the law goes into effect are biodegradable ones.” Interestingly, the official of the Ecology department admittedly shared that he believed six months was not a feasible timeline to completely remove all plastic from the island and enforce the ban on businesses.

### ***Changes After Ban Announcement***

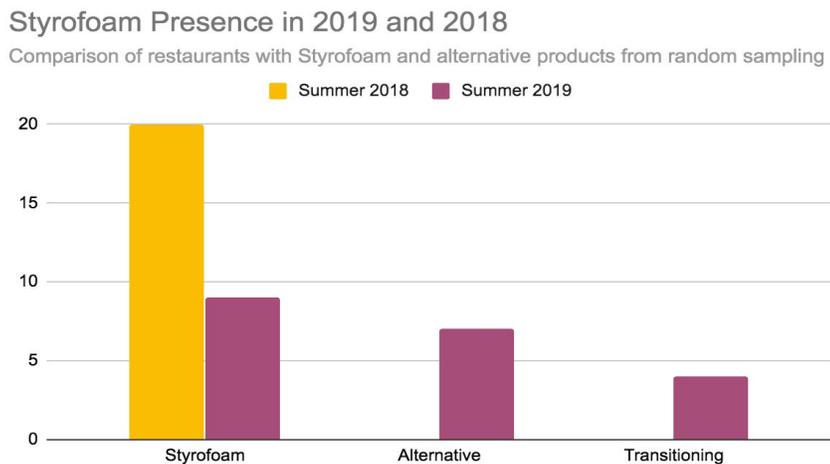
When I returned to the island in the summer of 2019, I found that there were many differences on the island in terms of the perceptions and behaviors of restaurant owners and vendors towards transitioning to alternative products. While there were similarities, there was still an evident shift in the concerns of restaurants that determined whether or not a business planned to transition to biodegradable products despite the ban.

### ***Restaurant Plastic Use (2018 vs. 2019)***

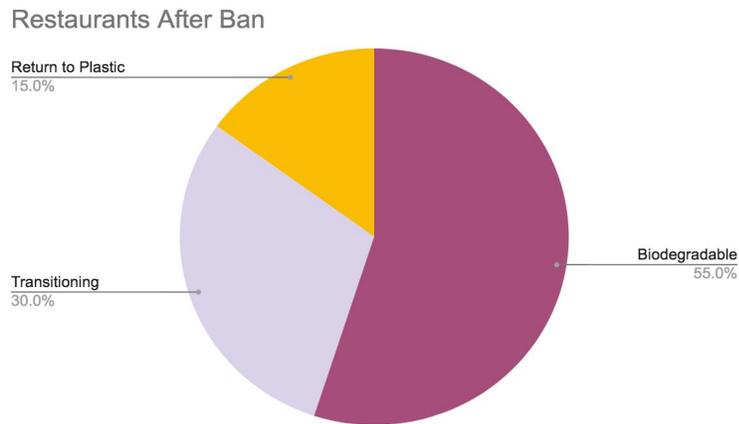
A second random sampling survey was conducted to compare the number of restaurants who continued to use plastic after the ban and compare the number found in the sample from the summer of 2018. This comparative analysis between the 2019 and 2018 random sampling surveys indicated that, following the ban announcement, less restaurants were using plastic and more were transitioning to biodegradable products. However, there were still more restaurants that used plastic than those who used alternatives. As Graph 1 indicates, all 20 restaurants of the 2018 sample survey used plastic, but in the 2019 sample only 9 used plastic, 7 used alternatives, 4

restaurants were transitioning to biodegradable products. The transitioning period for these sampled restaurants involved buying biodegradable products at a slow rate until they sold all of their plastic products and could restock their supply with alternatives.

Also, one of the most compelling findings when I returned in the summer of 2019 was that 15% of the restaurants who were transitioning to biodegradable products in 2018 had returned to plastic (Figure 6). Although 55% (n=11) restaurants had completely replaced plastic products with biodegradable alternatives, it was puzzling to understand why an owner would decide to stop the transition after the government announced a ban on single-use plastics.



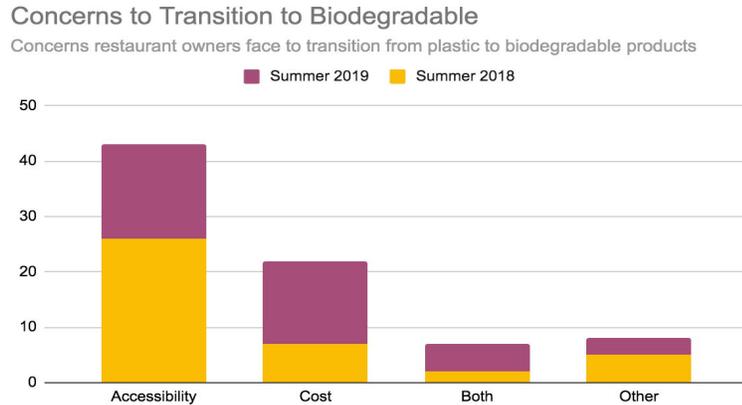
**Graph 1.** There were differences between the sample surveys conducted in 2018 and 2019. All restaurants used plastic in 2018. In 2019, 9 used plastic, 7 used alternatives, 4 restaurants were transitioning to biodegradable products.



**Figure 6.** After the announcement of the prohibition of single use plastics, 11 (55%) restaurants use biodegradable, 6 (30%) are transitioning to biodegradable products, and 3 (15%) restaurants from 2018 returned to plastic products

### *Restaurant Concerns*

To understand why restaurants were refusing or struggling to transition to biodegradable products after the 6-month probation began, I interviewed and surveyed vendors and restaurant owners. The survey indicated that the main concern to transition to biodegradable products remained accessibility (42.5%), but the concern of cost had increased (37.5%) since the summer of 2018. Figure 7 shows that in comparison to the concerns of 2018, cost has become a greater issue for owners and transitions after the ban has been announced. In 2018, accessibility was a main concern for 65% of restaurants compared to only 42.5% and for the concern of both, accessibility and cost, it increased from 5% to 12.5%. During interviews, it was identified that other concerns outside of accessibility and cost and represented as 'Other' in Figure 6 involves the concerns of functionality and aesthetic of biodegradable products.



**Graph 2.** There were differences in the concerns of restaurant owners and vendors between 2018 and 2019. Accessibility remained a main concern 65% (2018) and 42.5% (2019), but cost increased from 5% (2018) to 12.5% (2019).

Furthermore, during an interview with one of the restaurant owners who returned back to plastics, he explained his reasoning as:

*I know I had completely moved to biodegradable products last year at [Mario's bar], but I began to struggle financially and had to decide how I could cut back costs. I couldn't afford it anymore. And I am still trying to figure out everything. Then, when the ban was announced to be put in place the beginning of this year, then it wasn't I doubt it will be at this point. I haven't even heard any new news yet.*

Similarly, another owner disclosed that he does not believe the ban will be implemented at the deadline the government has proposed and explained how he would, "wait until it's serious before I make that type of commitment." Also, another significant change since the announcement of the prohibition is one of my participants from the summer of 2018 established a biodegradable business on the island. This has helped alleviate the problem of accessibility for restaurant owners since there was previously no store on the island to supply biodegradable alternatives. When asked what the main concern restaurant owners present to him when he approaches potential clients, Greg, one of the co-owners, described that they complain about the price and inform him that his

products are too expensive. He then explained that he informs them that customers prefer biodegradable products, because “I think the research you did last year.” However, cost continues to be a common reason for owners who decide not to work with Elige Bio.

To corroborate findings within the interview about the problems Elige Bio faces with potential buyers, I conducted a third observation of how Elige Bio sells their products. They met with a potential buyer who had previously tested their products before committing a partnership with them. This meeting was to address her concerns and preferences in their products. The owner tested Elige Bio’s small containers, large containers, and red and white paper for breadsticks. Immediately, she emphasized that she needed restock her smaller containers, because she had used almost all of the 100 containers within her first month of opening. She further explained that she did not want to place an order when their storage was empty, but Greg assured her that they would be able to deliver it to her if that did occur since they are on the island.

In contrast, she did not need to restock on large containers or the paper for breadsticks, because they predominantly use the large containers for entree takeout and her employees forget to place the bread in the paper rather than the containers. One of her concerns she shared was how sustainable the products would be in her storage space. She did not have a large space inside her restaurant, so she has to resort to putting supplies outside. She explained, “It is so hot and has no air out there. Will they go bad if they are out there? Because I don’t have much space inside.”

However, Greg informed her that the products could withstand those conditions since another client uses a similar storage space.

In addition to purchasing more small containers, the owner purchased straws, sauce cups, and stir sticks. She struggled to find the correct size for her cups, because the supply was either too small in width for frozen drinks or the correct width but too long for her cups. Also, only the smaller straws were wrapped in paper. She decided to begin with 100 straws to determine how quickly she uses them, and she bought the cheapest package that costs 100 pesos. The sauce cups, the price of the top and container was \$1.6 pesos per container or \$155 pesos per box, so she bought the box. Before she bought the stir sticks, she wondered if Elige Bio could imprint their logo on them since it was a preference of her business partner. Greg explained that he had previously searched for an imprint option but currently could not find one for biodegradable products.

### ***Vendors vs. Restaurant Owners***

While restaurant owners and vendors share similarities in their concerns to transition to biodegradable alternatives, they differ in many different ways that impacts how viable their businesses will be after the prohibition of single-use plastics is implemented and enforced. As Figure 7 indicates, social media is the primary source of communication used by 65% vendors and restaurants to be informed about the ban announcement of the government while the second source being family and friends was 17.5%. One difference between vendors and restaurant owners is their demographics. While all vendors (n=20) interviewed and surveyed were Islenos-born and raised on the

island of Isla Mujeres- only 15% (n=3) of the restaurant owners were Isleno. Most of the vendors operated a family business including the Islenos who owned restaurants. However, the foreign restaurant owners were businesses of one man or woman in which all of their employees nonfamilial. A majority of restaurant owners were from another country such as America and Argentina, or another city in Mexico. Also, restaurant owners and vendors differ in educational levels. All restaurant owners could read, but 25% of vendors were illiterate.

Furthermore, vendors and restaurant varied in their perceptions of the ban and the plans for its implementation. For instance, they differ in their perspective of the six month probation and how feasible it is for their businesses to remove all plastic by next year. Sixty-five percent of vendors were confident that they could remove their plastic in a 6-month time period while only 45% of restaurant owners shared the same confidence (Graph 3). During interviews, restaurant owners emphasized that they bought enough plastic to supply the year which they stored in their storage space. In contrast, vendors do not own a building or storage space, so they restock their plastic supply more frequently which accounts to why they are more certain to get rid of their supply within the six month period. Therefore, restaurant owners are more likely to experience more financial hardships, because they will lose more money if they are forced to dispose the products already purchased. One restaurant owner shared her sentiments regarding how other restaurant owners, including herself, will react to the six month time period when she stated:

*You can pass each and every restaurant and ask how many straws and plastics of takeaways they have. You will understand from that. No one is going to throw it out. As a business person, I will never do that even if I'm defending land and*

*everything. But still I'm not going to lose the money. I have to make a return first. And I'm talking about all the straws and plastics right now, but there are places where they use plates-plastic plates. What are they going to do? They are going to throw it? Yeah no, 6 months is really too short. But, if that happens? I am going to be the happiest person in the universe. But I think it's impossible.*

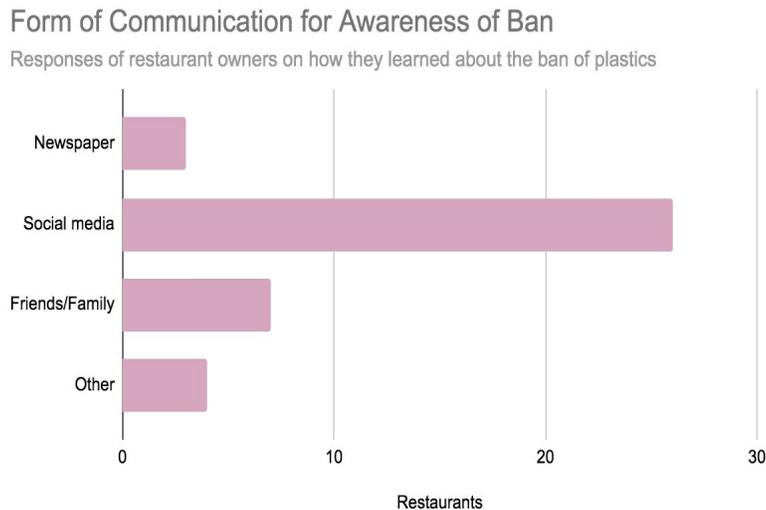
Similarly, another restaurant owner from Punta Sur expressed in a separate interview that if “the government requires us to throw all this plastic out then we have to buy more expensive products then that is money still. We are talking about money. It doesn't balance. It's not convenient. You need to make money off that to pass only biodegradable, and it's more expensive.” Only one owner out of the twenty interviewed explained how he would compensate for the cost difference between plastic and biodegradable products when he explained, “The cost is a fraction of the actual cost and the actual product of what we sell. But like I said, I can always move my prices up 5 pesos or put a direct charge on the takeout. I think it's a marketing thing. To be honest, I would love to.”

Because restaurant owners have buildings as opposed to vendors, they have taken advantage of their storage space and maintain a large supply of plastic to avoid frequent purchasing. However, this storage space has created an issue for owners during the six month deadline to remove all of their plastic, because they accounted for their supply to last at least a year. When a restaurant owner in La Gloria learned about the six month deadline and asked to identify potential challenges for owners he explained:

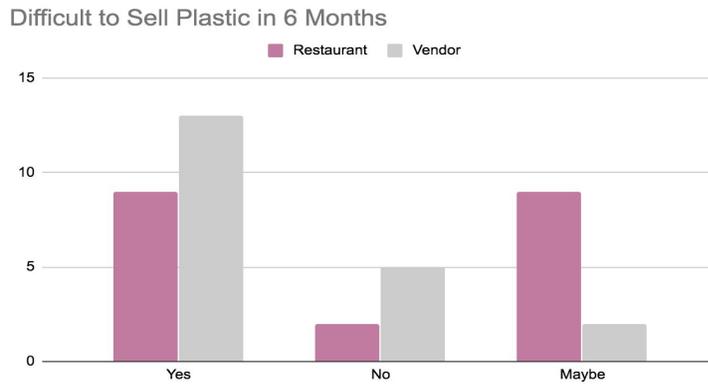
*6 months? It will not even happen in six years let alone 6 months. No. No. No. We have a stalk of plastic that I think we can survive with for the next four years. What am I going to throw them? Because that's an expense for me. So if you think about each and every restaurant that has the stalk of straws or plastic, whatever the plastic material is, they are not going to grab everything and throw it away, because that's money going away. If you sell something, you get back the*

*money. But you cannot just change (\*snaps fingers\*) like that. Unless otherwise you going to stop using plastic and you're going to do that and make it go. But still it doesn't work. That is too difficult.*

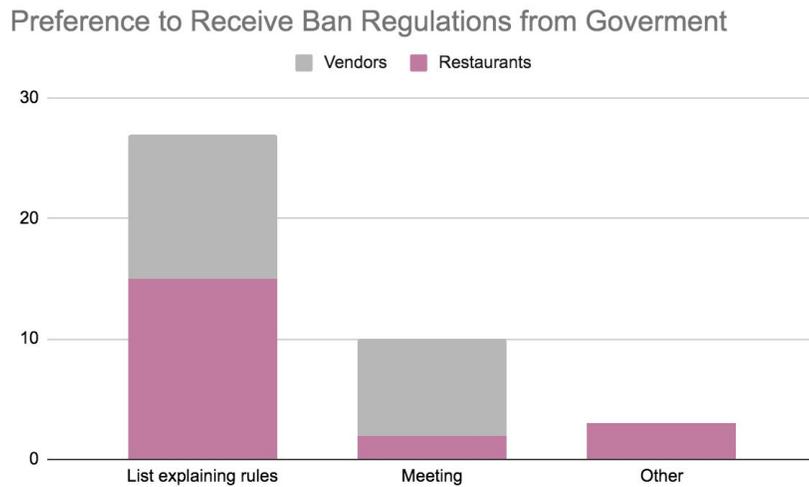
Moreover, because vendors and restaurant owners vary in educational levels, their preference for communicating with the government in regards to learning about the stipulations and enforcement about the ban differs. Only 10% of restaurant owners prefer a meeting compared to 40% of vendors preferring to meet instead of receiving a list (Graph 4). Because 25% of vendors are illiterate, they would not be able to read a list provided by the government. Thus, they would prefer a meeting rather than a list to fully understand the regulations regarding the ban of single-use plastics.



**Figure 7.** The way in which restaurant owners and vendors learned about the ban on single-use plastics. 65% learned through social media; 17.5% from friends & family; 7.5% from newspaper; 10% from other sources



**Graph .** The comparison of vendors and restaurant owners on how feasible it will be to get rid of all of their plastic in 6 months. 65% of vendors and 45% of restaurant owners answered 'yes'; 25% of vendors and 10% of restaurant owners answered 'no'; 10% of vendors and 45% of restaurant owners answered 'maybe'



**Graph 4.** The comparison of vendors and restaurant owners in their preference to receive information regarding the ban's regulations. 75% of restaurant owners and 60% of vendors preferred a list explaining the rules; 10% of restaurant owners and 40% of vendors preferred a meeting; only 15% of restaurant owners preferred 'other' mode of communication

### ***Anticipated Problems to Implement the Ban of Single-Use Plastics***

After interviewing, surveying, and observing the plans of implementation and perceptions of store managers, restaurant owners, vendors, environment activists, and residents, I have identified vital issues the government of the municipality will have to

address in order to successfully implement and enforce the ban of single-use plastics on Isla Mujeres.

### *Lack of Awareness and Miscommunication*

One of the main issues that arose during interviews and surveying is miscommunication between the government and community in terms of how they circulate information about the ban's regulations and sanctions. The survey of restaurant owners indicated that 45% had not received any information from the government. However, to corroborate this information, I asked this question during interviews with restaurant owners and found that 60% (n=12) of the restaurant owners complained that the government has not provided any information to their business. They followed updates through social media or discussing the ban with other business owners.

Also, there is only one biodegradable store on the island meaning that all other stores only supply plastic products. These stores are also the stores that a majority of businesses purchase their products from, because the alternative is a three hour trip, both ways, to Cancun. Therefore, it is vital that these stores are held accountable for ending the commercialization of plastics as they are the primary suppliers which the departments of Ecology and Public Services indicated that this was established in their plans of implementation.

However, interviews with store managers show that they believe their businesses are exempt from the ban indicating miscommunication between these businesses and the government plans. Therefore, they have not contacted biodegradable companies to

begin a partnership. The lack of biodegradable supply directly impacts the ability of businesses to transition to biodegradable alternatives. For instance, 80% of vendors claimed that they knew where to buy biodegradable products. However, interviews indicated that 95% of them were not aware Elige Bio was on the island, and they only knew companies existed in Cancun but were not aware of any specific vendors.

Similarly, a restaurant owner from downtown complained, “The plastic is in the stores. You have to cut off the plastic industry so then we will have to find alternatives. But the stores sell plastic, and everyone goes there and gets it. You can go to a store here and there is plastic everywhere. Is the government going to end the plastic industry? No. That is the problem. Not us.” Therefore, this miscommunication must be resolved immediately if the government plans to implement the ban in six months.

### *Biodegradable Requirements*

Another crucial problem the government will need to resolve is educating the community on the necessary requirements to properly manage the waste of biodegradable products. In order for biodegradable material to sufficiently degrade, they require an organic degradation of light, water, and oxygen (“Measuring Biodegradability”). During an interview with an environment activist on the island, she explained that biodegradable products “will not biodegrade in landfills, because artificial landfills lack the light, water, and bacterial activity that is needed to begin biodegradation.” Another activist, during a separate interview further explained the problems of biodegradation in Mexico, specifically, when she stated:

*And I think one of the big problems is that it says that you can't have single-use plastics, but you can biodegradable. But most biodegradable companies who tend to market biodegradable. We do not have an industrial composer anywhere*

*in the entire Mexico. They don't exist here. There are five in the U.S. So just switching everything to biodegradable does not work. Even if it is biodegradable and compostable if it goes into normal trash and landfill it has to break down and creates methane instead of breaking down to compost, because it has to break down with oxygen in order for it to make compost. So just banning plastic which is what the law isn't a full solution. If every single restaurant switches all of their plastic straws for avocado seed straws tomorrow, we haven't solved the problem. We painted it a different color.*

This interview highlights multiple issues surrounding the removal of plastic and replacement of these products with biodegradable products. The first issue that she identifies is the need for an industrial composer in Mexico. An industrial composer is how biodegradable materials can efficiently degrade into compost rather than methane. Because the state government is pushing businesses to replace their plastic with biodegradable products, it will have to create an industrial composer to manage this new material of waste. Otherwise, the biodegradable alternatives will break down into methane and continue to harm the environment. As discussed in the Portland ban of Styrofoam, the replacement of plastic impacts how well a ban of plastic will be implemented.

Secondly, the education of separating garbage is a problem the community of Isla Mujeres continues to face. The owners of Elige Bio, the only biodegradable business on the island, were not aware that their biodegradable products required their clients to separate from landfill waste, so they have not informed their clients of this stipulation. This is a problem, because if the biodegradable company is not even aware of these requirements, then the general public and their clients are not either and these products will continue to be misused. Also, as more restaurants transition to biodegradable products, they will be responsible for educating tourists about how to

correctly dispose of their biodegradable cups, plates, and straws. For example, during an observation of the beach, I noticed that there are separate trash bins for non-recyclables, recyclables, and organic material. However, I watched 16 tourists unknowingly place their biodegradable waste in the non-recyclables bin, 7 placed their waste in recyclable bin, and no one threw them in the organic bin (Graph 5).

Finally, Mexico has passed a federal law mandating that people separate their garbage. However, in Isla Mujeres specifically, Public Services has faced challenges with regulating waste management laws. For example, they have ordered the community to place their garbage out between 10PM and 11PM, because stray animals will tear open the bags if they place them out during the day. In order to regulate this new regulation, they have removed public bins to encourage people to place their waste at during that hour. However, as the official of Public Services explained, “this is a strategy that may work over time for the locals, but it doesn’t count for the fact that tourists are still walking around with trash in their hands and just put it somewhere.” This is an example of how the tourism-based economy impacts the laws passed on the island. When establishing a law, government officials have to take into account not only the actions of their citizens but of tourists as well.

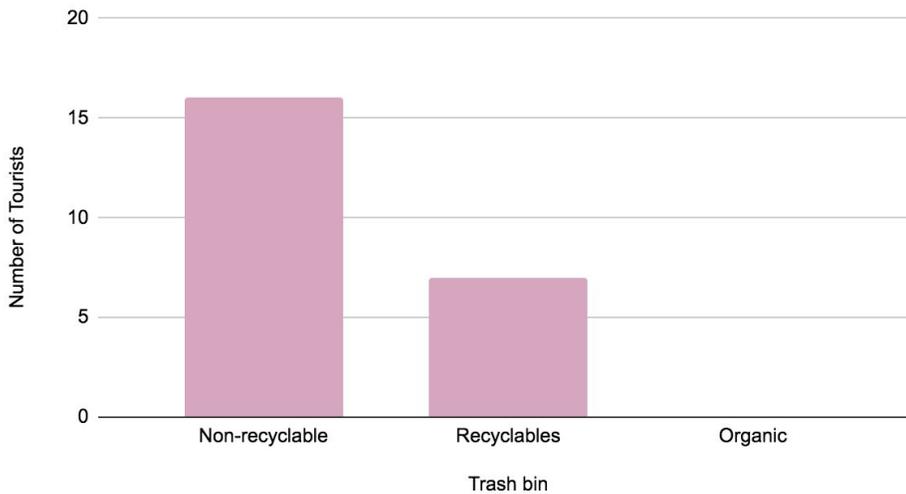
Furthermore, the municipality has not fully implemented the law, because they are continuing to establish other necessary formalities. For example, Public Services described:

*There’s still a catch up phase, because we don’t have separate organic and inorganic trucks yet and we also don’t have separate organic or inorganic pick up days yet. So right now, it really depends on the people, but by the first of August we want to really figure out if it’s going to be the two separate trucks or the two separate days and really have it fully enforced people separating their trash.*

However, there has been opposition to this law as one resident explained during an interview. He reported, “The government says separate your organic and inorganic trash, but the people say, ‘no.’ They will throw the trash together and do not separate. The man will come and say ‘pay me and I will not see it,’ so they keep doing it.” This report differs from how the government described the norms on Isla. The official of the Public Services described the culture as people will resist if “you try to tell them they shouldn’t do this or that. But if it’s a law that you cannot do this, they tend to be good and comply. No one actually fights the law that hard.”

Nevertheless another resident explained that, “You can tell them not to touch this and they will be like why and keep hitting it and say ‘ow’ but keep doing. It doesn’t matter. They know it is important, but they do not care. The government explains and tells the community, but they do not respond. They do not care to listen. When Chedruai got rid of plastic bags, people were like ‘Why?’” Therefore, in order for the ban on single-use plastics to effectively be implemented and enforced, the municipality of Isla Mujeres will first need to control and enforce the compliance to the federal law mandating people to separate their garbage. Otherwise, people will continue to disobey the law and place biodegradable products in conditions where they will break down into methane, further harming the environment.

### Disposal of Biodegradable Waste



**Graph 5.** The findings from the observation of tourists disposing their biodegradable waste. 16 tourists placed their waste in the non-recyclable bin; 7 tourists placed their waste in the recyclable bin; 0 placed their waste in the organic bin.

### *Existing Plastic Plastic Issues*

To effectively implement the ban of single-use plastics on Isla Mujeres, the government must tackle the normative use of plastic that continues to create resistance to the new law. The normative use of plastic alongside the norms of the island will create a difficult task for the government to implement, regulate, and enforce the removal of single-use plastic from the island.

One vendor explained in an interview that the “culture is never going to change, because they don’t care.” During the interview, he described how people become apathetic towards environmental regulations, because the elders do not believe these affect them. A restaurant owner from La Gloria emphasized that, “The government alone is not going to work out. It has to be something by the population for the population, for the place.” According to this owner, the government must gain the

support of the community before it can implement the prohibition of single-use plastics. If the sanctioning of the ban relies on people denouncing others, then the support of the community must be a priority of the government to enforce the ban.

Another restaurant owner from downtown proposed a possible reason for the lack of support from the community support when she stated, “I think [the government] will have a hard time, because of the lack of culture and education on the importance of why you need to stop using plastic.” This was a common theme across interviews in which people tied the lack of support from the community to the culture of the island and a lack of understanding the importance of environmental regulations.

Furthermore, as the date for implementation of the ban continues to change, the more people doubt whether or not it will actually go into effect. When it was first announced in October 2018, the goal was to have it set by the beginning of 2019 (. However, it was never enforced nor were any updates released by the government. As of December 2019, stores continue to sell only plastic products with the exception of biodegradable garbage bags. Similarly, other plastic issues continue to exist such as grocery stores and supermarkets replacing plastic bags with new bags that use a plastic covering. Also, residents have complained that these bags, meant to be reusable, cannot be used after three times.

The lack of awareness regarding the importance of the ban has created difficulties for restaurants, vendors, and stores to transition to biodegradable products. For example, one store manager described how he attempted to sell a biodegradable cups and containers made of coconut that was very similar in quality to Styrofoam.

However, he reported that people refused to buy those products and continued to purchase the cheaper plastic and Styrofoam merchandise. Therefore, he had to discontinue his supply of those biodegradable products since he was not making a profit and losing money. This experience is shared by many other managers and owners. The government must address the concerns of these businessmen since they are the primary target for enforcing the new law. If the government does not create programs or campaigns to help businesses transition to more expensive products as they remove their plastic, then many businesses will face financial hardships and either refuse to comply to the law or comply and lose their businesses.

### **CONCLUSION: PRACTICAL SUGGESTIONS**

The findings from interviews, surveys, and observations indicate that although there are many problems the government must address before it can successfully implement and enforce the ban, it is a feasible task. One of the primary issues with the structure of the ban is the time period required for sensitive areas, such as Isla Mujeres. Both the government and community of Isla do not believe six months is enough time to implement a law that creates a dramatic shift to the lives and businesses on the island.

Secondly, the government must continue to find a way to incorporate tourists into their plans since they hold a strong community on the island and will play a vital role in denouncing those who do not comply with the law. Also, effectively enforcing the law that requires people to separate their garbage will have a direct impact on how successful the replacement of biodegradable alternatives will be for the island. Tourists, residents, stores, vendors, and restaurant owners must all be educated on how to

dispose of biodegradable material and provide the necessary conditions for it to organically decompose, starting with developing an industrial composer in Mexico.

Finally, if the municipality of Isla Mujeres plans to hold restaurants and hotels accountable for the ban first, then they must address their concerns and improve communication with them. Restaurant owners and vendors be informed first about any updates regarding the law. Campaigns or support programs must be established to assist businesses in transitioning to biodegradable alternatives. Also, they must provide more suppliers for alternatives on the island, beginning with the stores that only sell plastic. It is difficult for owners to remove their plastics when they cannot buy any new products to replace them with. If restaurants cannot remain in business after the ban, the tourism-based economy will be negatively impacted. Therefore, the government and owners must work together to remove all single-use plastics from Isla, and they must create an awareness campaign that gains support from the rest of the community for everyone to feel responsible for upholding the new law and sanctioning wrongdoers.

## **IMPLICATIONS AND FUTURE RESEARCH**

This research was constrained by time, because I could only conduct it for eight weeks. Therefore, I could not continue my research on whether or not the ban was implemented in January. However, I have remained in contact with many of my participants who have informed me that the waste separation law continues to be discussed and not enforced. An extension of this research will be to study how the law requiring people to separate their garbage is enforced and its effect on the

implementation of the ban on single-use plastics. Also, my research only focused on the process of implementation on a municipality level which limited my access to federal affairs and engagements. Future research would be to study the ban from a federal lens by interviewing members of the Congress of Quintana Roo or the Secretary of State who is responsible for the publishing of the prohibition.

Moreover, the major supermarket on the island that is the primary supplier of plastic continues to only sell biodegradable garbage bags and replaced plastic bags for produce with paper bags, but it still continues to sell plastic cups, straws, plates, among other materials. Another potential study would be to investigate how stores end their business connections with the plastic industry. This study can be restricted to Isla Mujeres or studied at a state level in which one could investigate how the government of Quintana Roo plans to remove the plastic industry from their entire state with this ban in place.

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