Creating Replacements for Single-Use Plastics in the Cuenca Soup Kitchen

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Authors:
Lali Berelashvili
Samantha Braun
Cal Lebak
Colette Webster

Advisors: Esther Boucher-Yip, Gary Pollice

Sponsor: Cuenca Soup Kitchen

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ABSTRACT

The Cuenca Soup Kitchen aims to be an environmentally conscious operation by reducing plastic waste. Through interviewing volunteers and observing their operations, we found that plastic bags used to package rice, produce, salt, and sugar lead to high plastic waste. We developed processes for creating reusable bags from single-use bags for the rice and produce and identified how to reuse plastic water bottles for salt and sugar. These recommendations will save the Cuenca Soup Kitchen over $900 per year as well as prevent them from using over 18,200 single-use bags per year.
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Environmental issues are a growing global problem. The rising global temperature affects the natural environment as well as community health. Consequences include food scarcity, lack of access to clean water, and deteriorating natural habitats (Rossati, 2017). Over 99% of peer-reviewed scientific literature about climate change agrees that human activity is the main cause of this problem (Lynas, 2021). One large contributor is the use of single-use plastics. Their easy accessibility and low price make them desirable to individuals and businesses, despite their toll on the environment. These single-use plastics make up 40% of the plastic produced annually, and after their short utilization period, spend hundreds of years in landfills (Parker, 2021). They pollute the land and seas (Barnes, 2019), release toxic gases into the air (Verma, 2016), and contaminate food and water with microplastics (Rahman et al., 2021). Fortunately, organizations globally have started implementing environmentally conscious practices to mitigate these negative effects. The Cuenca Soup Kitchen in Cuenca, Ecuador, is one of these organizations.

The Cuenca Soup Kitchen provides food kits to local families in need. They currently serve over 750 individuals every month, providing them with basic foods and essential household items. This service aids their recipients; however, the process generates harmful waste. The Soup Kitchen aims to mitigate this, as they aim to help both the community and the environment. They have made progress on their mission to be eco-friendly since their establishment in 2017. They distribute reusable, biodegradable diapers, reusable egg cartons and tote bags that the recipients return. They plan to distribute reusable menstrual pad kits as well. The Soup Kitchen, however, also has to consider their budget when reducing their environmental impact, as to not disrupt their mission of helping local families in need.

Early in our communications with the Cuenca Soup Kitchen, we determined that their biggest source of waste was in their use of plastic bags. Because of this, we decided on a goal of reducing their single-use plastics. We achieved this goal through three objectives: assess the current sustainability of practices at the Cuenca Soup Kitchen, identify best practices used by similar organizations, and develop solutions to replace single-use plastics in the Cuenca Soup Kitchen. We achieved these objectives through observation, participant observation, semi-structured interviews with stakeholders and similar organizations, case study analysis, and surveys.
RESULTS

We found that the largest source of plastic waste within the Cuenca Soup Kitchen was the single-use plastic bags used to individually package items they purchased in bulk. These bulk items include rice, produce, salt, and sugar. Each recipient gets a food kit with around 4.4 pounds of rice separated into two separate bags, a bag of produce, and a bag of sugar or salt, in addition to other pre-packaged items. The distribution of these kits occurs every two weeks to around 175 families, amounting to nearly 750 people. Therefore, the Soup Kitchen uses approximately 700 single-use bags on these bulk items at every distribution, amounting to around 16,800 plastic bags per year. We concluded that it was necessary to replace the plastic bags with an eco-friendly alternative.

We also found that these plastic bags were unpopular amongst volunteers because they are inefficient to work with. Tying each bag takes time and is strenuous on the fingers of the volunteers. Additionally, sharp produce, such as plantains, often tear through the bags, requiring repackaging. We determined that our ideal alternative should be more efficient, along with being eco-friendly.

We researched and interviewed similar organizations that have implemented environmentally friendly, reusable products in place of single-use plastic bags. An interview with Beyond Hunger, a food pantry located just outside of Chicago, Illinois, revealed that reusable bags have been an efficient replacement to their larger bags, but recipients were less likely to return them without an incentive. While observing the Cuenca Soup Kitchen, we determined that most recipients return the reusable egg cartons and cloth bags, indicating that this would not be a limitation for the Soup Kitchen. Beyond Hunger told us that paper bags are not a great alternative, as they have a weight limit and often rip with bulky items. Through case study research, we found that the Community Action Food Bank in Washington addressed similar sustainability issues. They received help from students at Washington State University who created reusable bags for the pantry from textile waste. We determined that a reusable item would be the most beneficial replacement for single-use bags.

Since budget is a major concern for the Soup Kitchen, we needed to consider that our solution be cost-efficient. Based on the results of our data collection, we decided to create a solution that repurposes waste into more durable and reusable packages for food. This means the materials are free and rescue plastic waste from the community that would otherwise end up in landfills.

RECOMMENDATIONS

Based on our findings, we recommend that the Cuenca Soup Kitchen replace the single-use bags for rice and produce with reusable bags made from repurposed plastic bags and to replace the single-use bags used for the salt and sugar with reused plastic water bottles.

The repurposed plastic bags are made from rescued plastic bags within the community. Ironing these single-use bags fuses them together, creating a thicker and more durable material. This material is then used to create reusable bags that can hold produce or rice. Produce bags have a drawstring closure made of braided plastic, while rice bags have a sewn-on zipper to ensure no rice spills out. We prototyped multiple designs of this bag to create the simplest and most durable version. We tested these bags for strength and durability and found that they hold around 15 pounds more than standard plastic bags, on average. These bags are also longer lasting than standard plastic bags. They
are cheap, with the only cost being a one-time cost of $0.20 for each zipper. Since they are easy to make, the volunteers at the Soup Kitchen could make them, or the Soup Kitchen could create a program in which recipients learn to make these bags themselves.

In addition to the repurposed bags, we recommend that the Cuenca Soup Kitchen use plastic water bottles to store and distribute salt and sugar. The volunteers would simply use a funnel to refill empty plastic bottles with salt or sugar. Water bottles are made from PET plastic, which is safe for reuse for food once cleaned with a solution of either dish soap or bleach with water. This system is completely free for the Soup Kitchen, apart from the one-time purchase of the funnels.

Both recommendations are a logistical improvement, since filling the repurposed bags and bottles is faster and easier than the old methods. Closing the drawstring, zipper, or twist bottle top is easier on the hands of the volunteers, and also allows the recipients to reuse these containers. All costs of these implementations are minimal and will be offset by the Cuenca Soup Kitchen’s savings from eliminating single-use bags. We have estimated that these changes allow the Cuenca Soup Kitchen to avoid using over 18,200 plastic bags per year, and save them over $900 every year, enough money to take three additional families from their waitlist and feed them for an entire year.
1 INTRODUCTION

The world is currently faced with urgent environmental crises that bring about cultural, societal, and environmental impacts. Environmental problems are abundant: levels of greenhouse gases in the atmosphere are high, the global temperature is rising exponentially (Thompson, 2010), and millions of species are facing extinction (Tollefson, 2019). The resulting weather events, decreased air quality, and increasing spread of disease affect community health (Rocque, 2021). Organizations and individuals must prioritize environmental sustainability to curb these crises.

The Cuenca Soup Kitchen in Ecuador is an organization that has dedicated itself to implementing environmentally sustainable practices, such as replacing plastic items with sustainable alternatives. Reducing plastic waste is a large part of being sustainable, though obstacles become apparent when attempting to do so. Changes must be both environmentally and financially sustainable. Further, we aimed to minimize disruptions to their daily operations while implementing these changes, otherwise, the commitment to becoming environmentally sustainable may interfere with their goal: “to provide food to those most in need”. The Cuenca Soup Kitchen wanted to reduce plastic waste without increasing expenses or disrupting their services.

The Cuenca Soup Kitchen has worked on going green for several years. One of the biggest advancements they have made is distributing food kits in reusable cloth bags, which their recipients return every two weeks. They also distribute reusable diapers and menstrual pads, reducing the amount of plastic that their recipients use. However, the organization still relies on single-use plastics. Some of this single-use plastic comes from the food distributors. In other cases, such as the salt, sugar, and rice, the Soup Kitchen buys the items in bulk and volunteers portion them into single-use plastic bags every week. Our focus was to introduce a more sustainable system of packaging and distributing these food items.

Thus, the goal of this project was to find financially responsible and easy-to-implement strategies for reducing plastic waste in the Cuenca Soup Kitchen. In the background chapter, we explore the necessity of implementing environmentally sustainable practices and detail the effect of plastic waste on the environment, along with discussing actions taken by other organizations. We also discuss Cuenca’s waste management and give a brief overview of the Cuenca Soup Kitchen. To achieve our goal, we assessed the operations and sustainability practices used by the Soup Kitchen. We identified practices used by similar organizations. Finally, we prototyped and tested solutions and received feedback from stakeholders of the Soup Kitchen. These objectives allowed us to deliver viable alternatives to single-use plastic within the Cuenca Soup Kitchen. In the methods chapter, we describe our research design to meet our objectives. We specify what methods and forms of data analysis we used to achieve each objective, including observation, interviews, and document analysis. We discuss the results of our data analysis in the findings chapter. The final recommendations chapter compares our solutions with the previous single-use plastic packaging used by the Cuenca Soup Kitchen.
2 BACKGROUND

Waste reduction is crucial when working towards a more sustainable future. Accumulation of non-biodegradable waste, including single-use plastics, is extremely harmful to the overall health of humans and the natural environment (Verma, 2016). In this chapter, we contextualize the need for organizations to adopt sustainable practices by discussing the harms of plastic waste. Next, we highlight four existing solutions to this problem in relation to food distribution. Finally, we discuss waste management systems in Cuenca, along with a brief history of the Cuenca Soup Kitchen.

2.1 ENVIRONMENTAL SUSTAINABILITY

In recent years there has been a shift in worldview, as people globally move towards creating a more sustainable world. Individual attitudes and values regarding environmental sustainability have greatly changed within the past few decades. A report by the Pew Research Center conducted over the span of five years found that concerns over climate change increased in most countries (Poushter & Huang, 2021). In the same report, half of the countries surveyed listed it as the number one threat to their country in 2018, overtaking concerns about nuclear attacks, cyberattacks, and rising powers of influence from other countries. These concerns continue to grow as climate change worsens and the need for environmental sustainability increases.

Changes in legislation accompany this growing concern. The UN Environmental Program website reports that there has been a 38-fold increase in environmental laws globally since the 1970s, including over 1,000 environmental agreements between countries (United Nations, 2019). Lawmakers focus on regulating pollution, carbon emissions, and plastic waste as these are the greatest threats to environmental sustainability (Fleming, 2020). These three threats are often linked together: plastics cause a large majority of pollution, as over 80% of marine pollution is plastic (Thushari & Senevirathna, 2020) and over 79% of plastics litter landfills (Geyer, 2017). This pollution leads to increased carbon emissions, further threatening the Earth.

2.2 PLASTICS

Plastic is an inexpensive, versatile, and durable material, making it a favorite among manufacturers. However, this embrace of plastic has led to billions of tons of harmful material littering the Earth. The majority of plastics cannot biodegrade and fewer than ten percent of all plastics produced are recycled as of 2017 (Auta et al., 2017). It is currently estimated that there are at least five billion tons of plastic waste in the oceans (Figure 1) and landfills (Barnes, 2019). Further, production of plastic required 6% of the global oil supply in 2018. Scientists predict this number will reach 20% by 2050 (Rhodes, 2018).

Figure 1: Plastic litters the beach on Freedom Island, Philippines (Daniel Muller, 2017)
Plastic decomposition varies greatly depending on the composition. Plastic bags, which are made from high- and low-density polyethylene resin, take around twenty years to decompose. Plastic bottles on the other hand, which are made from polyethylene and polystyrene, can take up to four hundred and fifty years (Chamas et al., 2020). The decomposition process can even be upwards of a thousand years for some plastics. A long lifespan could justify these numbers, but forty percent of plastics produced every year are single-use only (plastic bags, plastic straws, et cetera), meaning they are used once before disposal. These plastics accumulate (Figure 2) and spend hundreds of years in landfills (Parker, 2021). For example, plastic bags have an average working life of twelve minutes (New York Department of Sanitation, 2018). However, they take an average of twenty years to decompose (Chamas et al., 2020). They litter the Earth and contribute to air pollution. They release toxic gases when exposed to strong sunlight (Verma, 2016), which pollutes the air and ends up in water and food, ultimately posing a threat to human and animal health. The amount of toxic gas increases as more single-use plastic accumulates, further damaging air, food, and water quality.

Moreover, common plastics contaminate the environment with miniscule pieces of plastics, called microplastics. Due to their size—defined by the Ocean Service as fewer than 5 millimeters, they are incredibly difficult and costly to separate from other materials (Rahman et al., 2021). Microplastics contaminate water and food sources, leading to ingestion by humans and animals. The risk of microplastics contaminating water and food increases as single-use plastics become more dominant in everyday lives. Research on the effects of microplastics in the human body is limited, though groundbreaking studies reveal new information every day. Rahman et al. conducted a study on microplastics in February of 2021, revealing that ingestion of microplastics leads to oxidative stress, increased risk of cancer, and neurotoxicity.

2.3 ALTERNATIVES TO SINGLE-USE PLASTICS

To find solutions for the issue of single-use plastics, we must investigate sustainable alternatives. This section will discuss examples of alternative materials and methods that are successful in the food distribution process, including their benefits and drawbacks.
2.3.1 ALTERNATIVES TO PLASTIC PACKAGING IN FOOD DISTRIBUTION

One of the largest sources of plastic waste is packaging, a majority of which comes from the food supply industry (Accorsi et al., 2014). Plastics are often preferred in the industry due to their resistance to humidity and water, ability to withstand stress, and low cost (Accorsi et al., 2014). Figure 3 shows examples of food packaging, highlighting that most of it is plastic. Distributors consistently choose plastic over other materials to distribute their food, creating plastic waste at the start of the supply chain. Plastic packages allow for longer periods of transport without damage to the food or packaging. Plastics are also weather resistant, protecting the food through transport in extreme conditions. Overall, plastic provides great protection at a low price. However, these plastic packages are often single-use, and people discard them as soon as they consume the food (Accorsi et al., 2014). This short utilization period cannot justify the time these plastics spend in landfills.

One successful strategy to reduce plastic packaging is to replace it with biodegradable materials (Figure 4). Popular alternatives include bioplastics, paper, and cloth. Bioplastics are often made from corn flour or starch, cellulose, or polylactide (Peelman, 2013). Some bioplastics can biodegrade whereas others simply decompose quicker than plastics. Limitations to using bioplastics include cost and availability. Bioplastics can cost anywhere from 20-100 percent more than single-use plastics, and lack of widespread production limits their availability (Song, 2009). Further, functionality of bioplastics can vary greatly. Some materials used to make bioplastics, such as soy protein isolate, are more susceptible to moisture damage and have poor mechanical properties (Accorsi et al., 2014). Organizations also commonly use paper and cloth to reduce plastic waste. Restaurants across the United States have started using paper straws over plastic, and bagging take-out orders in paper bags (Su, 2015). Manufacturers have started producing bulk items in cloth bags over plastic (Song, 2009). The cloth bags are reusable, and they have a longer utilization period before people send them to either a recycling facility or landfill. The cloth must be recyclable, such as cotton, silk, or wool. When properly recycled, both paper and cloth are great alternatives to plastic.
2.3.2 RETURNABLE FOOD PACKAGING

A returnable packaging approach can reduce the amount of plastic waste generated in the food distribution process. This process, known as “reverse logistics”, entails returning products back to their location of origin (Gardas et al., 2019). The packaging used in this process must be durable enough to serve its purpose multiple times. Glass is one example of a sufficient material because it does not retain odors, can hold any type of food, and the food can be seen through the container (Carey, 2021). Thus, glass jars—and other sustainable materials with the aforementioned properties—are great reusable alternatives. Some companies have implemented returnable packaging for shipments of large products; however the process works effectively on a more personal level as well (Gardas et al., 2019). In the food distribution industry, packaging can be returned to the place of origin after it has served its purpose, ensuring it is reused or recycled. Returnable food packaging cuts down on large amounts of single-use containers. Non-profits around the United States have successfully implemented reusable packaging. Carey (2021) provides just a few examples of the many organizations that utilize returnable packaging:

• Usefull, a non-profit in Boston, Massachusetts, provides coffee cups to organizations and campuses that people can return and reuse.
• Go Box in Portland, Oregon, provides returnable takeout containers to restaurants, food carts, cafes & grocery stores.
• GreenToGo in Durham, North Carolina, provides durable takeout containers to members who download their app. Customers can pick up and drop off these reusable containers from participating restaurants.

Possible limitations to the use of returnable packaging include cost and inventory management. An organization must invest in reusable and durable forms of food packaging if they plan to utilize this method (Gardas et al., 2019). This creates a large cost upfront, however the savings generated from returned goods outweighs the costs (Silva et al., 2013). Customers may also find it inconvenient to bring containers back for reuse (Coelho, 2020). Since this process relies heavily on consumers returning the packaging, organizations must put a system in place to ensure materials are returned.

2.3.3 ZERO-PACKAGING GROCERY STORES

Some grocery stores in Europe adopted a zero-packaging model, as depicted in Figure 5. Beitzen-Heineke et al. interviewed some of these new stores about their operations in 2017 and found that they offered a variety of items including: dry grains, dairy products, fish, deli meats, shampoo, soap, and fresh produce. These stores do not necessarily have power over the packaging of the food before it gets to them. Many buy in bulk from a supplier and do their best to
reuse or recycle as much of the waste as possible. Where they can eliminate waste, however, is between them and the consumer. The most common way these stores operate is using reusable containers, which the customer brings back every time (Beitzen-Heineke et al., 2017). One study compared the differences in waste between a zero-packaging store and a normal grocery store. When the same thirteen items were purchased at both stores, the study found that the normal grocery store produced 132 more grams of plastic in the form of 34 pieces of waste (Salkova & Regnerova, 2020).

While the idea of these stores seems appealing, there are a few drawbacks to the zero-packaging model. This includes the need to produce a system in which the customer pays only for the weight of the food they buy, excluding the weight of the container. Other limitations include potential food waste, inconvenience for customers, a smaller variety of products available, hygiene considerations and food safety issues that may arise from customers bringing their own container (Marken & Hörisch, 2020). The most cited drawbacks from customers at zero-packaging grocery stores include limited food options and longer wait times in stores (Salkova & Regnerova, 2020).

### 2.3.4 Alternatives to Plastic Bags

Another large source of plastic waste is plastic bags, many of which come from the food industry. Around 5 trillion plastic bags are produced worldwide per year and recycle fewer than one percent (Ali et al., 2021). While people may focus more on reusable bags as a solution to this problem, sustainable disposable options also exist. When comparing plastic bags, paper bags, and bioplastic bags, each type of disposable bag has its own pros and cons. Ali et al. (2021) conducted a study asking twenty-one professionals in the field of sustainability to rank the importance of different criteria, then asked them to rate plastic, bioplastic, and paper bags in each of those categories. The researchers assigned numerical values for each type of bag that refer to how well that bag fits the criterion, with lower numbers being better. This data determined that bioplastic bags were the best, followed by paper and then plastic. Plastic bags ranked best in the criteria that most directly affects the user (weight and cost), however, which is likely why people still choose them. But while plastic bags have the best functionality compared to paper and bioplastic, the detrimental environmental effects of plastic bags give them the worst ranking overall. Some stores may have chosen paper bags as their go-to replacement because of their biodegradability and comparative cheapness, but researchers have found that proper recycling is crucial for paper bags to truly be sustainable. The third option is bioplastics, which are completely biodegradable and still hold the beneficial traits of plastic bags. Their production also has minimal negative impact on the environment (Karan et al., 2019). The largest barrier to the use of bioplastic bags is that no one widely produces them yet, making these bags difficult and expensive to obtain (Ali et al., 2021).

### 2.4 Environmental Sustainability Efforts in Cuenca

Countries worldwide, including Ecuador, are attempting to be more sustainable in an effort to curb environmental impact. Articles in the 2008 constitution of Ecuador recognize the right of a person to live in a healthy environment free of pollution, as well as the rights of Nature as an entity (Tanasescu, 2013). Ecuador is a leader of environmental regulations and protections, being one of the first nations to legally recognize that Nature itself has its own rights. As a result, legal action can be
taken against any person or organization that acts against the best interest of Mother Earth (Berros, 2021). Regardless, there is still a lot of progress to be made in achieving sustainability in Ecuador. For example, 70% of Ecuadorians said they believed recycling was essential, though only 16% of them were aware of waste management facilities, programs, or initiatives (Negash et al., 2021).

2.4.1 WASTE MANAGEMENT IN CUENCA

Over 140,000 tons of waste are disposed of per year in Cuenca. Currently the waste disposal in Cuenca is managed by a company called Empresa Municipal de Aseo de Cuenca, also known as EMAC (EMAC, 2021). They separate the waste into three categories: organic waste, recycling, and trash (EMAC, 2021). Organic waste, which makes up over 60% of the waste collected, is transported to the El Valle composting plant. Recyclables in Cuenca include metals, paper, cardboard, and both soft and hard plastics, which EMAC brings to any of the 250 local licensed recyclers (EMAC, 2021). EMAC also collects trash, including any solid waste that does not fall into the other two categories, and brings it to the Pichacay landfill (Tanasescu, 2013). Further, according to the National Program for the Integral Management of Solid Waste, people only recycle 5% of waste, while 25% is recyclable (EMAC, 2021). This suggests that people do not properly dispose of recyclable materials, even when programs are in place to allow them to do so.

2.4.2 CUENCA SOUP KITCHEN

The Cuenca Soup Kitchen is a private non-profit organization located in Cuenca, Ecuador. The Cuenca Soup Kitchen’s website explains that their original mission in 2017 was to provide lunches for Venezuelan refugees, though their recipients’ demographics have since expanded. Since the COVID-19 pandemic, they have shifted their function to providing meal kits instead of hot meals. Despite their name, their operations now resemble those of a food bank or pantry. They also provide basic necessities such as soap, toilet paper, menstrual hygiene kits, and clothes. Currently, the Cuenca Soup Kitchen supports more than 750 people each month with these supplemental kits (Figure 6), giving them out to 175 families every other week. The Soup Kitchen hopes to expand the amount of people served, as there are hundreds more on their waiting list.
Unfortunately, the Cuenca Soup Kitchen’s essential services generate plastic waste that contributes to the environmental crisis. Not only do they buy food in plastic packaging, but they then repackage some of it into single-use plastic bags for distribution. Serving 750 families per month accumulates a lot of plastic. As the organization grows, the amount of plastic packaging will continue to grow with it. Finding alternatives to single-use plastics can reduce this negative impact on the natural environment.

The Cuenca Soup Kitchen has taken steps in addressing the issue. Some initiatives they have taken include providing reusable, biodegradable diapers, providing reusable bags for food kits, and having recipients reuse their egg cartons to be refilled each distribution day. They also plan to launch a program distributing reusable menstrual hygiene products soon. These are wonderful steps that have surely made a great difference. Yet the Soup Kitchen still needs to do work to maximize their sustainability, including addressing the use of single-use plastics and implementing eco-friendly alternatives.
3 METHODOLOGY

The purpose of this project was to reduce single-use plastics in the Cuenca Soup Kitchen. We developed three objectives to accomplish our project goal:

1. Assess sustainability of current practices at the Cuenca Soup Kitchen
2. Identify best practices used by similar organizations
3. Develop solutions to replace single-use plastics in the Cuenca Soup Kitchen

In this chapter we discuss how we gathered data to achieve these objectives. We also explain why we chose these research methods, as well as limitations to data collection. Appendix A includes a Gantt chart outlining our timeline used to complete these methods.

3.1 ASSESS CURRENT SUSTAINABILITY OF PRACTICES OF THE CUENCA SOUP KITCHEN

In order to determine potential areas for change in the Soup Kitchen, we wanted to understand the current operations and practices. We used observation, participant observation, and semi-structured interviews to gain a comprehensive understanding of all facets of the Soup Kitchen. Research design limitations can be found in Appendix B.

3.1.1 OBSERVATION

We observed how the Soup Kitchen prepared (Appendix C) and distributed food kits (Appendix D). This allowed us to understand their activities and needs. We received photos, videos, and notes of the packaging and distribution of the food kits provided by Desmion Dizney, a co-director of the Cuenca Soup Kitchen.

We conducted observations and took notes while volunteers packaged food kits. We also observed recipients receiving their kits. Additionally, we took notes recording how many participants returned the reusable bags and egg containers the Soup Kitchen had given them in previous weeks. This data can be found in Appendix D.

3.1.2 PARTICIPANT OBSERVATION

Participating in the activities of the Soup Kitchen gave us greater insight into how implementing changes may affect the volunteers. This method of observation included immersing ourselves in the operations of the Soup Kitchen by taking on the role of one of the stakeholders (de Munck & Sobo, 1998). We participated by volunteering in a variety of activities at the organization, including packaging and distributing the food kits. We took notes on our experiences and analyzed those to see where the Soup Kitchen has strengths and weaknesses in terms of efficiency (Appendices E-H).
3.1.3 SEMI-STRUCTURED INTERVIEWS

Interviews are a great way to collect data directly from the community where research is being conducted. Semi-structured interviews allow for honest communication; an established rapport creates a comfortable environment where participants feel encouraged to share their experience (Beebe, 2014). Specific, predetermine questions are asked yet the interview is not probing or intrusive, leading to in-depth answers from the interviewees (Beebe, 2014).

We mostly learned the practices of the Soup Kitchen through observation and participant observation, but we also gained insight through our interviews. We chose to interview volunteers due to their first-hand experience with the operations. They have been consistently working with the Soup Kitchen and had invaluable experience to share with us. We interviewed six volunteers from the Soup Kitchen. Five of these volunteers were North American expats chosen by Desmin based on who she thought would be most helpful. The Soup Kitchen’s only Ecuadorian volunteer was also chosen, since he had been working with the Soup Kitchen for years and could offer more insight to any cultural issues that could occur. Our goal was to learn about which practices generated the most plastic waste. We encouraged interviewees to lead the conversation, though key topics were covered including: essential services, areas of inefficiency or high waste, and previous changes (successful or unsuccessful). with volunteers took place in the Soup Kitchen on the day of packaging food kits. We took recordings with consent of the interviewees, and later transcribed these interviews. A full set of sample interview questions can be found in Appendix I. Transcribed interviews can be found in Appendices J-O.

3.1.4 SURVEY OF RECIPIENTS

We sought to understand the level of plastic waste in the community, specifically with the people that come to the Cuenca Soup Kitchen. We surveyed the recipients as they checked in at the Soup Kitchen to receive their food. We asked how many plastic bags and bottles they use per week to gauge the level of plastic waste in the community. Surveys allowed this process to be quick yet efficient. To ensure that language barriers did not cause confusion, we received help with conducting the survey from the bilingual staff. The survey results can be found in Appendix P.

3.2 DETERMINE PRACTICES USED BY SIMILAR ORGANIZATIONS

Restaurants, food pantries, and similar organizations have worked to find new ways to be sustainable throughout the years. We wanted to learn ways that these organizations have become eco-friendly, to evaluate their ideas and consider them for the Cuenca Soup Kitchen.

3.2.1 SEMI-STRUCTURED INTERVIEWS
Organizations around the world have conducted sustainability endeavors. Semi-structured interviews helped us gain insight on these innovations. As opposed to regular interviews, semi-structured interviews consist of more open-ended questions to leave room for discussion, allowing us to receive a larger caliber of information. We interviewed Beyond Hunger, a food pantry located in a suburb just outside of Chicago, Illinois, due to their similarities to the Cuenca Soup Kitchen. They offer take-home food kits similar to those of the Soup Kitchen, and experience similar limitations of physical space and financial constraints. They also aim to incorporate eco-friendly practices in their organization. The CEO of Beyond Hunger, Michele Zurakowski, agreed to an interview about sustainability within the organization, along with financial restraints and general challenges. The interview guide can be found in Appendix Q, and a summary of this interview can be found in Appendix R.

Sustainability practices conducted by similar food pantries are likely to be cost-efficient and feasible to implement. Additionally, successful implementation of these methods in other organizations suggests plausible success within the Cuenca Soup Kitchen.

3.2.2 CASE STUDY ANALYSIS

In addition to interviews, we also used case study analysis to determine best sustainability practices used by other organizations. We researched organizations that distributed food at a scale similar to that of the Cuenca Soup Kitchen. We used in-depth academic research to determine how well proposed solutions performed, and any feedback the author(s) of the research had. We researched a sustainability project conducted by students at Washington State University. This project aimed to reduce plastic bag use in a food pantry, similar to the Cuenca Soup Kitchen. Analyzing how different organizations have incorporated environmental sustainability into their business allowed us to consider a wide variety of solutions.

3.3 DEVELOP SOLUTIONS TO REPLACE SINGLE-USE PLASTICS IN THE CUENCA SOUP KITCHEN

We aimed to create a solution to replace single-use plastics. In this development we continuously tested and evaluated our solution to make sure it could be implemented successfully. To do this we consulted those who had the firsthand experience with what we were trying to do.

3.3.1 SEMI-STRUCTURED INTERVIEWS

Volunteers of the organization’s services, along with the management, were consulted on potential changes to any current practices. These groups provided insight on whether the suggested changes fit with the Cuenca Soup Kitchen’s mission statement. Further, they explained how they believe those changes would impact them personally; we looked for positive or neutral impacts and worked towards refining any ideas that were met with hesitancy. Interviews began with an explanation of our ideas for potential changes. We then asked questions about their personal feelings toward these changes and how the changes might impact the function of the Soup Kitchen.
We again used semi-structured interviews to gain insight from the management and staff of the Cuenca Soup Kitchen. These interviews began with explaining our ideas for potential changes. Volunteers were then asked questions about how the changes may affect inner workings of the organization. All these interviews were conducted inside the Soup Kitchen. These interviews varied in length, depending on how many changes were proposed. The data collected from these interviews was categorized into positive, neutral, and negative responses. We then drew conclusions from the interviews to determine whether our suggestions should be considered for implementation. Appendix S contains an interview guide for gaining feedback from stakeholders.

### 3.3.2 PROTOTYPING

We prototyped multiple bag designs to decide which would be the best alternative to single-use bags. We prioritized that making the bags would be simple and quick for the volunteers, but also that the bags were strong enough to hold pounds of rice and produce. We tested different materials, thicknesses, shapes, and methods of closing the bags. Prototypes were shown to Soup Kitchen Volunteers to get their opinions as to how useful these bags would be. We also tested our water bottle cleaning procedure to ensure that it cleaned the bottles and that the bottles would be dry in a reasonable amount of time. Finally, we tested the time required to fill all these bags and bottles to ensure our recommendations were quicker than the Soup Kitchen’s current practices, since this would be beneficial for the volunteers.
4 FINDINGS AND ANALYSIS

In this chapter we describe our findings about the Cuenca Soup Kitchen, as well as findings on sustainability practices in similar organizations.

4.1 ASSESSING SUSTAINABILITY OF PRACTICES AT THE CUENCA SOUP KITCHEN

We first assessed the current operations of the Cuenca Soup Kitchen, including areas of efficiency and inefficiency in relation to sustainability.

4.1.1 SINGLE-USE BAGS ACCOUNT FOR THE MAJORITY OF WASTE

We identified the highest waste areas in the Soup Kitchen through observation. We also found practices that were already zero waste and required little or no alterations, such as their model of distribution. They distribute food kits in reusable bags, so this was not an issue to address. However, the Cuenca Soup Kitchen currently buys rice, sugar, salt, and produce in bulk and then repackages them into individual plastic bags (Figure 7), which uses 700 single-use plastic bags per distribution. Over a year, the cost of these bags totals over $900.

In our interviews, we asked six volunteers about plastic waste within the Soup Kitchen. Five of the volunteers believed that single-use plastic bags generated the most waste. Three of these volunteers specified that the plastic bags for rice and produce were the culprit. The volunteers also spoke about the previous sustainability changes, such as biodegradable diapers and reusable menstrual pads. All six volunteers were in favor of these changes and believed that sustainability within the Soup Kitchen was an important goal to achieve. All of the volunteers acknowledged that the Soup Kitchen had made great strides in environmental sustainability so far but would love to see a change in the use of single-use plastic bags. Transcripts of these interviews can be found in Appendices J-O.
4.1.2 SINGLE-USE BAGS ARE INEFFICIENT

We assessed the efficiency of the Cuenca Soup Kitchen, since inefficiency may lead to wasted resources. We also wanted to streamline the distribution and packaging process by eliminating any areas of inefficiency. We found that the organization operates in an assembly line fashion, with a few volunteers at each station. The volunteers also move around to stations as needed, creating a dynamic system. The stations include: packaging food and packing take-home kits (Figure 8) on Tuesdays and checking in recipients and distributing the kits on Fridays.

The system of distribution is generally efficient, though some areas slowed down the process. Desmion Dizney and Bill O’Brien, our sponsors from the Cuenca Soup Kitchen, revealed that tying the plastic bags that contain the rice, salt, and sugar is time-consuming and not ideal. A volunteer agreed that the bags were inefficient since they take too long to tie and often tear. This interview can be found in Appendix I. We later learned that tying these bags is repetitive and strains the finger joints of the volunteers (Figure 9).

4.1.3 REUSABLE ITEMS ARE RETURNED

An interview with a volunteer (Appendix K) revealed concern that reusable bags would not be returned to the organization. Both Desmion and Bill shared this concern and stated that it has been a challenge in the past. Our data showed that out of the 88 recipients who were served at the kitchen that day, 17 were first time recipients and had no reusable items to return. Seventy-one were returning recipients. Out of these 71, 10 did not return their reusable bag, with seven of them bringing another bag to carry their food, two receiving a new bag, and one being turned away. 14 of the recipients did not return their reusable egg carton, with nine of these 14 bringing their own carton and five receiving new cartons. Two people returned multiple egg cartons, having forgotten to return them two weeks prior. This data can be found in Appendix D.

The outlined data suggests that the majority of recipients do return their reusable items. A large portion of those that do not return bags bring their own reusable bags instead. This suggests that Cuencanos are open to using returnable and reusable items.
4.2 IDENTIFYING BEST PRACTICES USED BY SIMILAR ORGANIZATIONS

We researched and interviewed similar organizations in order to determine successful implementation strategies for sustainable practices.

4.2.1 USING REUSABLE PACKAGING

In a similar project conducted by students from Washington State University, students made reusable bags for their community food bank out of textile waste. According to the Food Bank Director, elimination of disposable shopping bags saved their food bank $3,000 a year. This food bank also worked with around 700 recipients, comparable in size to the Cuenca Soup Kitchen (Salusso, 2018). This finding supports our idea that repurposed bags would save the Cuenca Soup Kitchen money in the long-term. It also suggests that repurposing community “waste” is a successful way to be environmentally sustainable without increasing budget or disrupting services.

Beyond Hunger, a food pantry located just outside of Chicago, Illinois, has implemented reusable bags while experiencing exponential growth, from serving around 100 people a month in 2008 to over 40,000 people in 2021. Their growth suggests that reusable bags are a solution to single-use bags on both large and small scales; this is important to the Cuenca Soup Kitchen since they also aim to expand their outreach. To ensure that the reusable bags are brought back, Beyond Hunger offers encouragement in the form of one extra item per bag. These extra items are usually items received through donations. This suggests that reusable bags are most successful when recipients are incentivized to bring them back. However, Beyond Hunger still faces the issue of not finding a suitable replacement for plastic packaging for their produce and similar goods. They had considered alternatives, with the most promising of them being paper bags. They found, however, that paper bags are not durable enough for their needed use. This interview was not able to produce any new ideas for the Cuenca Soup Kitchen but was helpful in eliminating other ideas through Beyond Hunger’s years of experience.

4.3 CREATING SOLUTIONS TO REPLACE SINGLE-USE PLASTICS IN THE CUENCA SOUP KITCHEN

We found that single-use plastic bags are responsible for the majority of plastic waste in the Cuenca Soup Kitchen. We aimed to find alternative storage solutions that reused plastics from the community.

4.3.1 PLASTIC BOTTLES

The Cuenca Soup Kitchen distributes salt and sugar in small plastic bags. Each recipient receives one of these bags, either salt or sugar, every two weeks. We prototyped washing and filling plastic bottles and found that they are a viable alternative to plastic bags. These bottles can be
reused, thus keeping them out of landfills while reducing the number of plastic bags used at the Cuenca Soup Kitchen. There was an initial concern that reused plastic bottles may not be food safe, since there is a popular belief that chemicals can leach out of the bottle into its contents. However, several organizations and researchers have disproven this claim. Plastic bottles are made from polyethylene terephthalate (PET). A study on PET bottles found there is not an amount of leaching that occurs that could cause harm (Borde et al., 2016). Additionally, the United States Federal Drug Association (FDA) has stated that PET plastic is safe to reuse for food purposes as long as it is properly cleaned (U.S. Food & Drug Administration, 2022), which simply requires soaking the bottles in warm water and dish soap.

4.3.2 REPURPOSED PLASTIC BAGS

We looked to find alternatives that the Cuenca Soup Kitchen could use to store and distribute rice and produce, as they used single-use plastic bags for this. According to a 2017 study conducted by the New York Department of Sanitation, single-use plastic bags have an average lifespan of twelve minutes. The use of single-use bags in the Soup Kitchen is a large area of waste. We found a method to create reusable plastic bags, referred to as repurposed bags, from single-use plastic bags, through testing and prototyping of different methods. We discovered through research and prototyping that there are options to make reusable bags from single-use plastic bags.

We prototyped a reusable bag made from fused plastic fabric (Figure 10). To make this bag, we cut single-use bags to the desired size and layered them on top of each other, placing wax paper on top. We ironed it until the plastic layers fused together, which created the fabric of the bags. To seal it into a bag shape, we placed wax paper inside and ironed the seam until it fused. We then either cut small slits in the top of the bag to weave a drawstring through or sewed on a zipper, depending on the type of closure we needed. Instruction for this process can be found in Appendix T. It took an average of 3 single-use bags to make each repurposed bag. Strength testing showed that these repurposed bags with four layers of plastic can hold an average of 37 pounds. This number correlates heavily with the thickness and fusion of the bottom seam. Greater attention while ironing the seams increases the weight that the bags can hold. For comparison, strength testing on single-use plastic bags found that they can typically hold around 20 pounds. Anecdotal evidence suggests that repurposed ironed bags function for up to 5 years. We considered the safety of this method. Single-use plastic bags are made from high density polyethylene (HDPE). According to the FDA’s guidance for industry, this plastic is FDA approved for food contact. The
material safety data sheet of HDPE states that fumes can be released at 300 degrees Celsius, while its melting point is only 120-150 degrees Celsius. Therefore, ironing plastic bags together will not produce toxic fumes.

Through our research we also found that plastic yarn, commonly referred to as “plarn”, is used as fabric. Plarn is made from strips of plastic bags, which are cut and tied together. This is then crocheted or knitted in the same manner as fiber yarn. There were several patterns online for creating “plarn” bags (Figure 11), which we hoped to apply to the Soup Kitchen. However, we found that this method can be time consuming. Crocheting a single plarn bag can take upwards of two hours, not including the time it takes to make the plarn itself. The number of plastic bags needed to make one plarn bag varies, depending on the size and strength of the plastic bags. The minimum is generally 30 bags whereas the average is 45 bags. There is little research on the lifespan of “plarn” bags, but anecdotal evidence suggests they have an average lifespan of 3-6 years, depending on the frequency of use.

Our survey results also showed that the majority of the Soup Kitchen’s recipients use between 3-6 single-use plastic bags per week, however results ranged from 1-20 bags. This includes all uses, such as shopping bags and trash bags, as well as any other miscellaneous uses. The Soup Kitchen could ask recipients to donate their plastic bags in exchange for a one-time incentive. Volunteers at the Soup Kitchen could then iron them into the reusable bags, or they could have recipients make the reusable bags themselves with their own bags.
5 RECOMMENDATIONS AND CONCLUSION

In this chapter, we explain our recommendations to replace single-use bags with repurposed bags and plastic bottles. We detail how these solutions would benefit both the Soup Kitchen and the environment.

5.1 USE REPURPOSED BAGS AS STORAGE FOR RICE AND PRODUCE

Single-use plastic bags are inefficient and wasteful. We suggest that the Cuenca Soup Kitchen replace them with repurposed plastic bags (Figures 12-14). These repurposed bags are a favorable alternative for numerous reasons. Primarily, they reduce single-use plastic in the Soup Kitchen. Recipients can bring the bags back so the volunteers can reuse them for the next week’s distribution. On top of that, they take plastic bags out of the community since the plastic bags would otherwise end up in a landfill. Even the wax paper used in the ironing process is reusable. These repurposed bags are also more durable than single-use bags, and withstand harsh weather (i.e., rain, wind). They’re stronger than single-use bags, since they can hold an average of fifteen more pounds. Additionally, if any severe rips or tears do occur, a scrap piece of plastic can be fused over it to patch the hole. Further, the repurposed bags are inexpensive to make and eliminate the need for the Soup Kitchen to buy new bags, ultimately saving them money. They can make repurposed bags with single-use bags collected from recipients and volunteers. The Kitchen would only need to purchase wax paper and zippers. With a price of $0.20 per zipper, the money saved from no longer buying bags more than covers this cost. The Soup Kitchen would not lose money if recipients did not return them, compared to reusable tote bags. These repurposed bags also use drawstrings and zippers, which speed up the packaging process. Volunteers do not need to tie them, an inefficiency that occurred with single-use plastic bags.
We recommend the ironed bags over plarn bags because they require less time and skill to make. Plarn bags also have holes, as most crocheted items do, and thus would only work for larger items such as produce. The Cuenca Soup Kitchen is also limited in storage and would likely not have space necessary to store the amount of plastic bags needed to make plarn bags.

Instructions for making repurposed bags were presented as an infographic (Figure 21 in Appendix T), as well as a video that can be found on YouTube (Appendix U). An infographic and video were chosen so volunteers could have visual aids while they made the bags. Visual aids ensure that the volunteers are making the bag correctly with each step, making the process much easier. Volunteers may prefer to learn from a video or from written instructions, hence both the infographic and video were created. Instructions are written in English, as volunteers at the Cuenca Soup Kitchen are mainly American and Canadian expats.

5.2 REPURPOSE PLASTIC BOTTLES FOR SALT AND SUGAR

We recommend that the Soup Kitchen reuse empty plastic water bottles to distribute salt and sugar to their recipients. As previously discussed, plastic bags and plastic water bottles account for a large portion of plastic pollution. They are only used for a matter of minutes, but the plastic will last decades. In an ideal world, laws would limit the production and use of these bottles, but realistically we are a long way from that. Repurposing and reusing these water bottles can be a great way to help reduce plastic waste.

Currently, the Cuenca Soup Kitchen transfers salt and sugar from bulk packaging into smaller plastic bags. We propose that plastic bottles be used in place of the smaller plastic bags. A funnel helps the salt and sugar pour into the bottle (Figure 15), and then a volunteer can screw the lid shut. Transferring these items into plastic bottles would be not only environmentally conscious, but also easier and faster for volunteers, and cheaper for the Soup Kitchen. As stated in one interview with a volunteer, it is common for Cuencanos to
reuse such items for food storage, so it would not be an adjustment for them. Additionally, when a salt or sugar bag is opened by the recipient, the bag becomes useless for storage. Comparatively, the plastic bottles tops make the bottles convenient for storage and reusable to the Soup Kitchen. Finally, the use of plastic bottles would eliminate the need to tie plastic bags which, as multiple volunteers stated, is time consuming and becomes painful. As previously stated, plastic bottles are safe to reuse as food storage as long as they are probably cleaned.

5.3 COMPARISONS OF RECOMMENDATIONS

Table 1 compares the current packaging practices of the Cuenca Soup Kitchen to our proposed solutions based on packaging, cost, convenience for volunteers, convenience for recipients, and total single-use plastics per distribution. All numbers are based on the assumption that the Cuenca Soup Kitchen distributes 175 kits every two weeks, which reflects their current practices. As the Soup Kitchen grows, these numbers would grow with it.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Before</th>
<th>After</th>
</tr>
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<tbody>
<tr>
<td><strong>SALT AND SUGAR</strong></td>
<td></td>
<td></td>
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<tr>
<td>Packaging</td>
<td>1 single-use bag per family every two weeks</td>
<td>1 reusable bottle per family every month</td>
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<tr>
<td>Cost</td>
<td>$546/year</td>
<td>Free</td>
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<td>Convenience for volunteers</td>
<td>Easy to fill</td>
<td>Easy to fill</td>
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<tr>
<td></td>
<td>Hard to tie</td>
<td>Easy screw-on top</td>
</tr>
<tr>
<td>Convenience for recipients</td>
<td>Light and easy to carry</td>
<td>Light and easy to carry</td>
</tr>
<tr>
<td></td>
<td>One opened cannot use for storage</td>
<td>Can be reused easily for storage</td>
</tr>
<tr>
<td>Criteria</td>
<td>Before</td>
<td>After</td>
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<tr>
<td>----------------------------------------------</td>
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<tr>
<td><strong>Total single-use plastics per distribution</strong></td>
<td>175 plastic bags</td>
<td>0 new single-use plastics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rescues 175 water bottles total from single-use</td>
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<td><strong>Packaging</strong></td>
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<td></td>
</tr>
<tr>
<td>2 single-use bags per family every two weeks</td>
<td></td>
<td>1 reusable bag per family per every two weeks</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>$252/year</td>
<td>One-time $0.20 cost per zipper</td>
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<tr>
<td><strong>Convenience for volunteers</strong></td>
<td>Easy to fill</td>
<td>Easy to fill</td>
</tr>
<tr>
<td></td>
<td>Hard to tie</td>
<td>Simple zipper</td>
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<td>Takes approximately 30 seconds to fill</td>
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<td></td>
<td>the two bags (one serving)</td>
<td>the one bag (one serving)</td>
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<tr>
<td><strong>Convenience for recipients</strong></td>
<td>Light and easy to carry</td>
<td>Light and easy to carry</td>
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<tr>
<td></td>
<td>Once opened cannot use for storage</td>
<td>Can be reused easily for storage</td>
</tr>
<tr>
<td><strong>Total single-use plastics per distribution</strong></td>
<td>350 plastic bags</td>
<td>0 new single-use plastics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rescues 1000 plastic bags total from single-use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2 used per bag, 500 bags)</td>
</tr>
<tr>
<td>Criteria</td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>PRODUCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>One single-use plastic bag per family every two weeks</td>
<td>One repurposed bag per family every two weeks</td>
</tr>
<tr>
<td>Cost</td>
<td>$103.68/year</td>
<td>Free</td>
</tr>
<tr>
<td>Convenience for volunteers</td>
<td>Easy to pack</td>
<td>Easy to pack</td>
</tr>
<tr>
<td></td>
<td>Big enough for bulky items</td>
<td>Big enough for bulky items</td>
</tr>
<tr>
<td></td>
<td>Must tie each bag</td>
<td>Easy use of draw string to close</td>
</tr>
<tr>
<td>Convenience for recipients</td>
<td>Easy to carry</td>
<td>Easy to carry</td>
</tr>
<tr>
<td></td>
<td>Produce often rips through bag</td>
<td>Produce does not tear bags</td>
</tr>
<tr>
<td>Total single-use plastics per</td>
<td>175 plastic bags</td>
<td>0 new single-use plastics</td>
</tr>
<tr>
<td>distribution</td>
<td></td>
<td>Rescues 2000 plastic bags total from single-use (4 used per bag, 500 bags)</td>
</tr>
</tbody>
</table>

Table 1: Table comparing current vs suggested practices for salt and sugar, rice, and produce

5.4 CONCLUSIONS

Our solutions would save the Cuenca Soup Kitchen a total of $901.68 every year, with the only cost to them being the zippers, which, at $0.20 each, would have a one-time cost of $100 for 500 bags, enough for the Soup Kitchen to have one set to fill while the recipients have the others. This would prevent the use of 18,200 single-use plastic bags per year, and rescue 3,000 single-use grocery bags and 500 plastic bottles from landfills. The money saved with this plan is enough to feed three additional families for an entire year. Our recommendations will greatly reduce single-use plastics within the Soup Kitchen and provide many financial and logistical improvements.
There is still always more progress to be made. Future projects could tackle reusing or eliminating the packaging that their bulk products come in, or helping the Soup Kitchen implement their plan of distributing reusable menstrual pad kits. We wish them the best of luck in all their future endeavors and look forward to seeing them make the world a little brighter—and a little greener.
REFERENCES


Salkova, D., & Regnerova, O. (2020). Methods of eliminating waste from food packaging as a globalization tool. SHS Web of Conferences, 74. https://doi.org/10.1051/shsconf/20207404025


## APPENDIX A: GANTT CHART

(Shown in Table 2)

<table>
<thead>
<tr>
<th>Objectives and Methods</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess Current Practices of the Cuenca Soup Kitchen in Relation to Sustainability</td>
<td>1/10</td>
<td>1/17</td>
<td>1/24</td>
<td>1/31</td>
<td>2/7</td>
<td>2/14</td>
<td>2/21</td>
</tr>
<tr>
<td>Observation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant Observation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Structured Interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determine Practices Used by Other Organizations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Structured Interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Document Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outline Possible Pathways for Change and Get Feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Structured Interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Gannt chart for objectives and methods
APPENDIX B: RESEARCH DESIGN LIMITATIONS

Our research had a few limitations that may have affected our results. Our interviews and surveys were limited by sample size. We conducted six interviews specific to the Soup Kitchen, all with volunteers. Out of these six interviews, five were conducted with expats from the United States and Canada, and only one was conducted with a local resident originally from Cuenca. This was likely enough to gain insight into the volunteers’ thoughts on our project, however the perspective was skewed towards non-native residents. Although the Soup Kitchen has only one local Cuencan volunteer, it may have been beneficial to interview more locals. Additional interviews with other organizations also would have helped us gain a broader perspective.

The survey results may have also been limited by the sample size. The Soup Kitchen serves approximately 175 families during each distribution cycle. On the date that we conducted the survey, 70 responses were recorded from the 88 recipients that showed up. If we were able to survey more people from the total population of recipients, we could have produced a higher confidence level.

APPENDIX C: OBSERVATION OF PACKAGING KITS (FEB 1)

The following was written after Sam Braun’s observation at the Cuenca Soup Kitchen on Tuesday, February 1st.

Every other Tuesday volunteers come to the Cuenca Soup Kitchen to package the food kits. There were around 15 volunteers, and all but two were from the United States. The other two were Ecuadorian. The photo on the right (Figure 16) shows all of the items that go into a food kit. All of the food besides the eggs and produce for the week (this week was plantains and potatoes) are put into the reusable fabric bags. The items that come in bulk are the rice sugar and salt (recipients receive either sugar or salt and it alternates). Those plastic bags were filled and tied ahead of time by another set of volunteers. The process used to fill the reusable bags was an assembly line. The reusable bags are passed down the line and people add whichever item they are stationed at. The last step is adding the soap and toilet paper and the woman who did that would then tie the bags with what they call the “SuperMaxi tie” which secures the bag but makes it easy to open. The bags are then piled in the back “garage” area where the bags will be distributed on Friday. Another group of people who are stationed in the garage then have their own smaller assembly line for the produce, which all goes into the multicolored plastic bags. The produce comes directly from the farms and is extremely dirty. When one volunteer opened a large bulk bag of potatoes the room was filled with dirt/dust. The pile of those bags goes right next to the reusable one.

Figure 16: Contents of a food kit distributed by the Cuenca Soup Kitchen
(as pictured to the right). The entire process only took around an hour and over 100 bags were filled. During this process we also had two members of the team (Cal and Colette) helping in the assembly line for participant observation while Desmion pulled volunteers out of their stations to be interviewed by me; all of which likely slowed the process a bit. The volunteers were all extremely invested in the work they do there and most of them donate more of their time, money, and expertise from previous lives in addition to these packaging days. It is a close-knit group of volunteers: people brought many baked goods to eat during the process and then the majority of them went out to lunch afterwards and invited us along. Desmion described their relationship as a second family.
APPENDIX D: OBSERVATION OF DISTRIBUTING KITS (FEB 4)

(Notes shown in Table 3)

This sheet represents data taken during Sam Braun’s observation of kit distribution on Feb 4. For each recipient it was recorded if people brought back their reusable bag, egg carton, and any additional notes.

<table>
<thead>
<tr>
<th>Recipient #</th>
<th>Bag</th>
<th>Egg Carton</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td>#</td>
<td>brought cardboard carton</td>
</tr>
<tr>
<td>6</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

X = item was returned

= item was not returned

* = recipient was new

# = other (see notes)
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>x</td>
<td>x</td>
<td>child's bday</td>
</tr>
<tr>
<td>9</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>x</td>
<td>#</td>
<td>brought cardboard carton</td>
</tr>
<tr>
<td>11</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>x</td>
<td>#</td>
<td>brought cardboard carton</td>
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<tr>
<td>15</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>x</td>
<td>#</td>
<td>brought own plastic carton</td>
</tr>
<tr>
<td>17</td>
<td>x</td>
<td>x</td>
<td>put eggs into brought plastic bag</td>
</tr>
<tr>
<td>18</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>x</td>
<td>x</td>
<td>child's bday</td>
</tr>
<tr>
<td>22</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>x</td>
<td>x</td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>26</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td><strong>count error</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>x</td>
<td>#</td>
<td>brought own plastic carton</td>
</tr>
<tr>
<td>29</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td>returned neither item. they emptied the Soup Kitchen bag's contents into their backpack to avoid taking a new bag but they did receive new egg cartons</td>
</tr>
<tr>
<td>33</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>x</td>
<td>x</td>
<td>brought 2 egg cartons back - a result of forgetting to do so two weeks prior</td>
</tr>
<tr>
<td>36</td>
<td>x</td>
<td>x</td>
<td>brought 2 egg cartons back - a result of forgetting to do so two weeks prior</td>
</tr>
<tr>
<td>37</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
they emptied the Soup Kitchen bag's contents into their backpack to avoid taking a new bag

child's bday

stated that their egg carton had broke (which is probable) and they emptied the Soup Kitchen bag's contents into their backpack to avoid taking a new bag but did receive egg cartons

received new egg cartons
<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
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<td>58</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>x</td>
<td>#</td>
<td>brought own plastic carton</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>60</td>
<td>x</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>x</td>
<td>they emptied the Soup Kitchen bag's contents into their backpack to avoid taking a new bag</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>x</td>
<td>was denied food. According to Miguelito she had received previous warnings to return items</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td>x</td>
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<td>67</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
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<td>68</td>
<td>x</td>
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<td></td>
</tr>
<tr>
<td>69</td>
<td>*</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>70</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
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<tr>
<td>71</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>x</td>
<td>#</td>
<td>brought own plastic carton</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>brought own plastic carton</td>
<td>stated they came for their mother and was not aware of needed returns - they emptied the Soup Kitchen bag's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
contents into their backpack to avoid taking a new bag but they did receive new egg cartons

| 75 | x | # | brought own plastic carton |
| 76 | x | x | 76 and 77 was picked up by same person but was for two families? |
| 77 | x | x |
| 78 | x | x |
| 79 | x | brought a large trashbag and emptied kit’s contents into it |
| 80 | x | x |
| 81 | * | * |
| 82 | # | # | food kits for 25 people (see general notes) |
| 83 | count error |
| 84 | * | * |
| 85 | x | x |
| 86 | x | brought plastic bag to empty kits contents into |
| 87 | x | x |
| 88 | x | x |
| 89 | x | brought nothing |
| 90 | x | x | child’s bday |
We were instructed to leave by Desmion and Bill at this point but a few extra stragglers had yet to come.

Non-Specific Observation Notes

- If a carton was brought that wasn't one of two provided types, the same container they brought was filled and returned to them.
- For children's bdays donors provided gifts and a cake.
- A number of people brought their own plastic bags to store things.
- Michael's Bagels had donated pastries for the day and they were bagged into paper bags and distributed to recipients first come first serve.
- According to Des, Dunkin Donuts also typically donates food.
- Bag appeared heavy and difficult for some to carry.
- "Traditional" women commonly used scarves to wrap around their body and hold bag on their back.
- 25 food kits were provided for an organization that provides support to families who unofficially work at feria libre.
- All 25 bags were returned by woman who picks up food in her truck.
- Egg cartons are not used. Instead, whole pallets of eggs were given.
- There were 22 new people to come to the Soup Kitchen (number from check-in not this data).
- Some people were missed in data collection due to a variety of factors, but this data accounts for the large majority.
Miguelito was very strict with those who did not return items

many people had their own additional bags (backpacks, tote bags, purses, etc.)

Table 3: Observation notes of how many beneficiaries returned reusable items

APPENDIX E: COLETTE’S PARTICIPANT OBSERVATION (FEB 1)

Two volunteers were in the backroom with the shelves full of rice bags. They were placing bags of rice into the reusable cloth bags and piling them on a table in the doorway.

A few volunteers (including Cal and myself) were then taking the bags one at a time, and adding more small bags of lentils, salt, and other food items down the line. We then placed the bags on a table in the other doorway for the next volunteer to add soap, a roll of toilet paper, and possibly other items. I (Colette) also participated with this next volunteer by placing the bars of soap in each bag and then tying them. The bags were handed to me very quickly to be tied. They used a “SuperMaxi” tie by putting your hands through each bag handle, grabbing the opposite handle and pulling them through each other, twice. Desmion said that when plastic bags are tied this way, they can be untied and reused rather than having to rip the bags open. In the case of the cloth bag, it ensured that they were tied securely.

After the bags were tied, they were passed into the next room, where the produce was and stacked (Figure 17). The produce was not put into the cloth bags that I was tying, but were instead kept aside to be given out separately in plastic bags.

I found it to be effective how they had each step in the “assembly line” in different rooms, physically separated with tables in the doorway for bags to be placed on. I was also surprised by how quickly the process moved. All the bags were filled and stacked in under an hour, I believe. Sam completed 3-4 interviews in the time all the bags were filled.

The cloth bags were filled with the individual bags of rice, about 4 pre-packaged small bags of lentils/grains/etc, a small bag of salt, toilet paper, bar of soap, possibly a few other small items. They ended up being decently heavy, especially for something that has to be carried quite far by some people, which made me very aware of the fact that the packaging materials had to be lightweight.

Figure 17: Food kits ready for distribution
- Everyone knew exactly what they were doing, there was no lag time where people figured out what they were doing between getting there and starting

- Everyone knew everyone and they were very friendly

- There were four “stations”, one in each room
  - Back room with (2?) people putting rice into the bags and putting them on the table
  - Middle room/hallway that I worked in- there was a row of bags of grains lined up on the tables, and then salt and margarine. We would take a bag and go down the line, putting one of each grain in it, and then place it on a different table. When the boxes or quintales were empty, whoever took the last one out replaced it. 4 people
  - At the next table, one person put a roll of toilet paper and two soaps into each bag
  - Handed it to one person who tied it “supermaxi knot” and placed it in a pile in the garage
  - Outside people were loading the produce into plastic bags and putting them in a separate pile, I didn’t fully see this process

- People chatted while working in our room. They talked about politics and current events and seemed very comfortable with each other, and seemed to agree on their political opinions

- Bags were slightly heavy, not too bad but after filling them for about half an hour my arm started to ache a little

- Definitely limited by space, everything was very cramped, but they were making it work
APPENDIX G: SAM’S PARTICIPANT OBSERVATION (FEB 4)

The following was written after Sam Braun’s participant observation at the Cuenca Soup Kitchen on Friday, February 4th.

When at the Soup Kitchen I simultaneously performed observation and participant observation. The purely observational data I collected is in Appendix D. This day was the first time we were able to see the distribution of kits due to COVID restrictions and this distribution is only done biweekly so we had to maximize our time. My role in the distribution was to fill the egg containers (Figures 18 & 19) as people came and returned them. There were two types of containers that have been provided to the recipients; a plastic 15 egg container and two plastic tubs commonly used in take out here in Cuenca (they hold 6 eggs each). Each person gets 12 eggs which come from large “pallets” of eggs that are stacked on the side of the wall to begin (shown in the images above). As people came they would first give us (me and Miguelito) their bag and egg containers. We would then give them the pre-packaged reusable bags with the plastic bag of produce inside. We would also give them a set of eggs. I tried to have two packaged up at all times so the people would not have to wait to receive them. There was a very specific way of packaging the eggs in the to-go containers to allow them to all fit (three on bottom and three on top) which Miguelito taught me. If people came with a container that was not one of the two standard ones I filled the same container they gave me. Some of the plastic containers returned were slightly crushed or dented but still usable. They also were not particularly clean - not so much to be a health concern especially since you don’t eat the outside of the egg. But they were dirty enough that you would not feel comfortable getting it from the store. Many people came with kids - this is likely because it is currently summer here and the kids do not have school. Everyone who came was very grateful. I watched one family eat a pastry that was donated as soon as they got their food and Desmion said it may have been because they have not eaten recently and were extremely hungry.

Additionally, the Soup Kitchen did everything possible to go the extra mile for their recipients. Figure 20 shows packaged pastries donated by a local bagel shop. Before recipients were allowed to get their food me, Colette, Des, and Smith (the financial manager) packaged all of the pastries into individual
paper bags. There was not enough for everyone, but it was still a kind treat. On the bottom left you can see some of the birthday kits provided. The Soup Kitchen tracks the birthdays of all the children who come to the kitchen. For every distribution day, if a birthday comes in the next two weeks, volunteers (who Desmion calls their Abuelitas) buy a gift and a cake to give to the kid. Most families who come to the Soup Kitchen cannot afford these things, but Desmion says that it is important that every child is celebrated. Overall it was an amazing experience and I got a lot of insight into how the distribution is done.

APPENDIX H: PARTICIPANT OBSERVATION OF FILLING RICE BAGS (FEB 17)

Sam and Colette participated in filling rice bags to be distributed to recipients. We joined two regular volunteers in filling single-use plastic bags for over an hour. The initial process included scooping rice from large bins using a measuring cup, placing a plastic bag over the measuring cup, and tipping it to ensure all rice is dumped into the bag. The bags are then tied and placed into a bin to be distributed the following week. This process took approximately 1 minute for 2 pounds of rice.

We then tested our zippered bag design by filling it several times. The process entailed scooping rice in the same measuring cups, but the rice had to be poured into the bag rather than tipped. Our repurposed bags each fit 2 pounds of rice, and the process took around 35 seconds; the repurposed bags reduce both the amount of bags used and time spent filling them.

APPENDIX I: INTERVIEW GUIDE FOR VOLUNTEERS

Invitation: You are invited to participate in an interview regarding your experience at the Cuenca Soup Kitchen. This interview is part of a larger research project conducted through Worcester Polytechnic Institute.

Purpose of Research Study: The purpose of this research is to help the Cuenca Soup Kitchen reduce plastic waste in an effort to become more environmentally sustainable. This research will be published.

Nature of Interview: The interviews will be conducted in a semi-structured, semi-formal manner. Researchers will ask specific, predetermined questions but encourage participants to share any experiences they feel are relevant. Questions will be focused towards the operations of the Cuenca Soup Kitchen and waste generated at the organization. Interviews may take around 30 minutes per person.
Confidentiality: Information collected from interviews will be anonymous. Names and other identifiable information, such as age or address, will not be shared nor recorded.

Participation in this research study is completely voluntary. Refusal to participate will not result in any penalty to you, and you may decide to stop participating in the research or skip any questions at any time without penalty.

We encourage you to ask any further questions you may have about the research before we begin. For more information about this research or about the rights of research participants, or in case of research-related injury, contact:

Lali Berelashvili
Samantha Braun
Cal Lebak
Colette Webster

at: gr-soupkitchen-c22@wpi.edu

Gary Pollice:
gpollice@wpi.edu
Esther Boucher-Yip:
efboucher@wpi.edu

Interview Guide

Questions for volunteers:

● Describe your typical day at the Soup Kitchen.

Questions for Recipients:

● Describe a typical interaction with the Soup Kitchen.

General questions:

● Can you tell us about the current services that the Soup Kitchen provides?
● What are some of your favorite services here at the Soup Kitchen? Your least favorite?
- Where do you think the biggest areas of inefficiency are in the Soup Kitchen?
- Where do you think the most plastic waste is produced in the Soup Kitchen?
- How do you think the Soup Kitchen has improved in the past couple of years?
- What are the most essential services the Soup Kitchen provides to its users?
- Do you think that the Soup Kitchen is an environmentally friendly operation?
  - If yes, please provide some examples as to how.
  - If not, why do you feel this way?
- Do you have any suggestions as to how the Soup Kitchen could become more green?

Invitación: Le invitamos a participar en una entrevista sobre su experiencia Cuenca Soup Kitchen. Esta entrevista forma parte de un proyecto de investigación más amplio realizado a través del Instituto Politécnico de Worcester.

Propósito del estudio de investigación: El propósito de esta investigación es ayudar al Cuenca Soup Kitchen a reducir los residuos de plástico en un esfuerzo por ser más sostenible desde el punto de vista medioambiental. Esta investigación será publicada.

Naturaleza de la entrevista: Las entrevistas se llevarán a cabo de manera semiestructurada y semiformal. Los investigadores harán preguntas específicas y predeterminadas, pero animarán a los participantes a compartir cualquier experiencia que consideren relevante. Las preguntas se centrarán en el funcionamiento del comedor social de Cuenca y en los residuos generados en la organización. Las entrevistas pueden durar unos 30 minutos por persona.

Confidencialidad: La información recogida en las entrevistas será anónima. Los nombres y otra información identificable, como la edad o la dirección, no serán compartidos ni registrados.

La participación en este estudio de investigación es completamente voluntaria. La negativa a participar no supondrá ninguna penalización para usted, y podrá decidir dejar de participar en la investigación u omitir cualquier pregunta en cualquier momento sin penalización.

Le animamos a que haga cualquier otra pregunta que pueda tener sobre la investigación antes de que empecemos. Para obtener más información sobre esta investigación o sobre los derechos de los
participantes en la misma, o en caso de lesiones relacionadas con la investigación, póngase en contacto con

Lali Berelashvili
Samantha Braun
Cal Lebak
Colette Webster

en: gr-soupkitchen-c22@wpi.edu

Gary Pollice:
gpollice@wpi.edu
Esther Boucher-Yip:
efboucher@wpi.edu

Guía de entrevistas

Preguntas para los voluntarios:

- Describa su día típico en el Cuenca Soup Kitchen.

Preguntas para los beneficiarios:

- Describa una interacción típica con Cuenca Soup Kitchen

Preguntas generales:

¿Puede hablarnos de los servicios actuales que ofrece el Cuenca Soup Kitchen?  
Cuáles son algunos de sus servicios favoritos? ¿Los que menos le gustan?  
¿Dónde cree que están las mayores áreas de ineficiencia en el Cuenca Soup Kitchen?  
¿Dónde crees que se producen más residuos de plástico en el Cuenca Soup Kitchen?  
¿Cómo crees que ha mejorado el Cuenca Soup Kitchen en los últimos años?  
¿Cuáles son los servicios más esenciales que presta el Cuenca Soup Kitchen a sus usuarios?  
¿Cree que el Cuenca Soup Kitchen es una operación respetuosa con el medio ambiente?  
Si la respuesta es afirmativa, facilite algunos ejemplos de cómo.
Si la respuesta es negativa, ¿por qué lo considera así?

¿Tiene alguna sugerencia sobre cómo el Cuenca Soup Kitchen podría ser más ecológico?
APPENDIX J: INTERVIEW TRANSCRIPT WITH VOLUNTEER #1

Sam:

Perfect. All right, that’s just going to be- it’s going, alright. So um, is it- , it’s great to meet you. So if you can describe a typical day here, what you do, are usually doing the awesome role of tying the bags?

Interviewee 1:

Oh, now we kind of usually... I’m back in the back room where we...where we end up, we do the two bags.. Two pound bags of rice. Then we have all the other dried bags. So we kind of work in an assembly line. So we kind of just plug and play wherever we’re needed to be. So we kind of work that assembly line with the dry goods first. Then we do like the papers and cleaning products, the paper products and soap and then we turn the bag over to the folks that are basically stocking up and getting ready and they have the eggs and the vegetables bags that have already been prepared. So we kind of plug and play wherever we’re needed.

Sam:

Yeah, that’s awesome. Great. And where do you think the most plastic waste is produced throughout the process?

Interviewee 1:

Well, we’ve eliminated a lot of it. Especially with the bags, because we used to use all plastic bags throughout the whole process for both the dry goods as well as the vegetables. Now we’re only using vegetables just because they’re kind of dirty and nasty. So we use plastic bags for that, but everything else is the cloth bags. We did that because we had some of our folks donate to buy enough bags to basically switch them out. So when the people come to pick up their goods on Friday, they return back from last week’s last pickups and we get some new back. Eventually those will probably get dirty and trashed out but we might be able to get at least a week, you know, a year to two years out.

Sam:

Awesome. And then, how-
I should stop, I'm sorry. And then the other thing is the plastic bags that the dried goods come in. There's plastic bags in there, and that's because we really haven't been able to find another way to do it. I mean, so that's the other thing, is things that are packaged or pre packaged in plastic.

Sam:

Exactly. So that's kind of like why we're here. The goal of our project, and why Bill and Des brought us on, is to help make everything here more sustainable. And we're really wanting to focus on the plastic because you guys have done a lot of work otherwise. But so one thing we've come up with is we've been able to make these bags out of just your regular plastic bags.

And you can iron them together and make them just like thicker plastic and then it's just like a drawstring bag. Here, you can see it if you'd like.

Interviewee 1:

Yeah no it looks terrific.

Sam:

Do you think you would see these being used or do you see any issues with those possibly being used for different things here or what do you think?

Interviewee 1:

The thing I could think most of all is possibly the rice. Because we actually take that from the larger, the 100 pound bags and repackage that. The things that are already pre-packaged, the lentils and the peas and the beans, that I don't see any- but the rice is definitely possible. We could even, if they were big enough, could use them for the vegetables. You know, and I don't know if we are looking at these as far as them returning them as well?

Sam:

I think that would be that would be looking forward

Interviewee 1:

I mean, that would be optimal.
Sam:
I mean, that’s definitely optimal. I know you guys had some issues having people bring back the reusable ones as is.

Interviewee 1:
Yes. So if we start asking them to bring more and more things back, that’s going to be problematic. That’s just not something that the culture here thinks about.

Sam:
That’s what we are thinking, also we’ve talked with a food pantry in the US as well, and they’ve had similar problems, so we’re working on some ways to improve that. But with these, I mean, the issue with plastic bags is they last way past our lifetime. If they bring them back, amazing, but also um what it takes to make these is just plastic bags and an iron, so worst case, all the goods were free. So worst case, if they don’t bring it back, it’s not the end of the world.

Interviewee 1:
Right, right right right. I mean, you’re at least making a dent in the process.

Sam:
Exactly

Interviewee 1:
I worked for Pepsi for about 16-17 years, as well as a couple of other bottled water companies. And the challenge, because we were always the evil giant because we were using plastic bottles, was trying to get to the point where we had basically a plastic bottle made out of as much recycled material- even potentially food products. Like for example we could, we had oils that we were using, but the problem is they turn yellow and people don’t want to drink water out of the yellow bottle. It’s perfectly fine, it’s not leaching into the product. But it looks bad because it gets exposed to sunlight. So, anyways, I didn’t mean to digress...

Sam:
No, that’s great information. Another idea, similar actually to that topic, is seeing possibly more for the salt and sugar because that comes in bulk as well. Possibly cleaning out different like plastic water bottles and being able to use those. What do you think about that? Do you see any problems with that? These are all just ideas so please, any flaws?

**Interviewee 1:**

No, no I don't see any issues. The biggest thing would be, we’d have to, you know, developing the process to be able to fill them. Making sure that the water bottles are dry enough, because sugar and salt would be a disaster if it starts-and wasteful, but yeah, we could use. I don't think there'll be a hesitancy, but one thing that I've noticed in the many years I've lived here now is the Ecuadorian people are pretty resilient about reusing products themselves. They usually go through - I mean if you walk around the street, you will see people that are going to the recycle bins and through trash bags, and actually pulling materials that they use in their own home for that they sell from a recycle stand port. So it’s more of a matter of cost. And they do it not necessarily environmentally. But they are concerned because they can get plastic containers free if they go through somebody's trash.

**Sam:**

That’s good. Yeah, I mean that works.

**Interviewee 1:**

So I don’t think there would be any hesitancy on our clients. You know, our families, if we use things like that, because they’re already doing it on their own.

**Sam:**

That's a great point. Yeah. Amazing. And then more on a personal level. How many plastic water bottles would you say you use in a week?

**Interviewee 1:**

None.

**Sam:**

Great. That’s the goal
Interviewee 1:

None. Trying to think of anything I do. Glass? Yes. Not true. Not true. I do buy agua con gas. The sparkling water. And I do have I do because that’s the only plastic bottle I think that I buy. Now wine bottles, that’s a different thing. But that’s glass. I recycle everything.

Sam: That’s amazing. And then same question, how many like plastic bags do you use in a week?

Interviewee 1:

Well, I don’t use any of the bags at the grocery store. Because I take my own bags my own my reusable bags, and you probably know they do charge now for the- they were doing it free for COVID, now they kind of got off. Yeah, I’m sure the stores will get back to it but they were charging for plastic bags. If you didn’t bring your own returnable bags. Yeah. So as far as bags the only thing I can think of is the trash bag. Is my blue recycle bag and the black trash bag. But as far as the others, I don’t use any bags. I do pick up my returnable bags to the stores.

Sam:

Awesome, that’s great. I mean most of the people from our school have been doing that too. And then, do you have any ideas of what you think the Soup Kitchen could do here to become more like green or eco friendly or anything like that?

Interviewee 1:

….because we really have been thinking about everything we could possibly do. Um, I’m struggling right now. I’m sorry. I can’t think of anything off the top of my head because I’m thinking so many things

Sam:

No that’s okay. You guys have tackled so many things, like the reusable diapers. Those are amazing to have.

Interviewee 1:

We’ve been doing that, we’ve also been trying to do the menstrual pads. Because our thing is, we’re trying to teach them. Sometimes it’s not even necessary but we’re trying to teach or show what to give our folks an idea of what might be able to be used differently than they thought about. Like they said about the diapers and the menstrual pads but I can’t think of anything at the top of my head, I’m sorry.
Sam:

No that’s a good thing I mean you guys have done a lot.

Interviewee 1:

The only other thing that I can- the toilet paper thing- there's really not much we can do. We give them toilet paper, the soap. And one thing we did do for the longest time and maybe we should think about this, I'm sorry I just thought of something. We did package soap, we got soap in multipacks like three bars of soap cause we would give them a bar of bath soap. We used to take them out and we used to put them in a separate plastic bag but I'm thinking that's another thing that we could potentially find a way to do to avoid the plastic bag in the wrapper. I don't know I'd have to think about that. Explore that one. But even the boxes that we use, that the goods come in, like the cooking oil, I take those cause I run a shipping business. So I take the boxes and I use them for boxes that are getting shipped out and so we kind of do our own recycling.

Sam:

Yeah, awesome. Thank you. It was great talking with you here. Well I’ll let you get you back to the assembly line.

APPENDIX K: INTERVIEW TRANSCRIPT WITH VOLUNTEER #2

Sam:

Alright, so that's just gonna be going. Um, so yeah, that's awesome. What have you been doing with the menstrual pads? How was that process worked?

Interviewee 2:

Well, um, first we had to find patterns.

Sam:

Yes.

Interviewee 2:
So there's a wealth of the stuff on the internet. And then I had to find the, the fabrics that would work that we could get here, Because we didn't want to import stuff from the US. And so I tried out a couple of different things. One of the useful things is that they make a lot of masks here, and they use this anti-fluid material. Oh, so it's, it's incredibly impermeable. Yeah. And so I can, I can use that as the outer layer. So there it doesn't leak. And so I came up with a combination of fabrics, we got two layers of diaper material. That's because a lot of people still use cloth diapers. Two layers of diaper material, two layers of flannel. And then on the giant size we use also one layer of terry cloth, all of which is pure cotton and available here. Yeah, it's super, super cheap.

Sam:

Good.

Interviewee 2:

Yeah. So the, the sanitary pads come out with the with layer of impermeable on the bottom. And then we have to use, uh, I'm using regular snaps because they have these plastic snaps here. Oh, my God, trying to get them open and closed. Yeah. You know, I don't want to see some woman fighting with her underpants.

Sam:

Not the problem you need in the bathroom.

Interviewee 2:

So we're just using regular snaps, which I'm not thrilled about. But, but it's what we can get Yeah. And so with all that, it costs anywhere from like, 30 cents to about 52 cents per pad depending on the size.

Sam:

That's amazing.

Interviewee 2:

Yeah. And so we're making these, these kits, they come in a plastic box. And they have, we're thinking six pads each, you know, and the women get to choose what size they need. Perfect. And also three pairs of underwear because a lot of people don't have underwear here. You know, I mean, they can
cover themselves, but you know, underwear’s a nicety, so, so the underpants are necessary to hold the pads in place. And so they’ll be able to use, and also a little bag so they can carry an extra pad with them. And it’s also the impermeable material, so that they can put the used one inside, and it won’t leak all over. Yeah. So, and then the box is, they can use that to soak the pads. Because if you soak them for a day or two, then they clean more readily.

Sam:
That’s amazing.

Interviewee 2:
And that, you know, they don’t have to use something from their food pantry to do so. So we’ve tried to think of everything.

Sam:
Yeah, sounds like you did. That’s amazing.

Interviewee 2:
So, you know, obviously there gonna be some women who are, you know, I need them for seven days. And some people are here for like, three. So we’re trying to make it so that we can mix and match. Yeah. And, and also, Des has found out that the gel diapers that we use, yeah. That the guy is also working on gel sanitary pads. Oh, but there is one thing that I’m not crazy about with those, is that it takes a day for them to dry.

Sam:
That’s a long time considering when you’re...

Interviewee 2:
Yeah, and especially if it’s during rainy season. It takes like three days to dry. Yeah. And I’m hoping that these won’t be as problematic as the gel ones. Yeah. That they’ll dry more quickly. Yeah. So anyway, that’s, I mean,
Sam:

It sounds cheap and easy to make, still. Did you guys hear I hear? Do you have volunteers making those? Or how are you guys producing them?

Interviewee 2:

Well, what we're doing right now is having volunteers cut them out. And then I have a friend who's a seamstress. And she got evicted from her house because, you know, business fell off. And so I think I'm gonna hire her to actually make them great, yeah. That will give her you know, a place on debt. Yeah. Let her feel like she's part of something. Oh, yeah. And she's, she's Ecuadorian. So yeah. Supporting community. Awesome. Yeah. Thinking that will work out nicely.

Sam:

Awesome. All right, and then more specific with the Soup Kitchen. So what does your typical day here look like at the Soup Kitchen?

Interviewee 2:

Well, we just do it, you know, four times a month. So two days are devoted to filling the bags and I work in the dry products department with the pre bagged. And so it takes very little time actually. It's surprising, yeah, about an hour to fill all the bags, and then another 20 minutes to do the setup. And so we went through that really quick. And then I come again on Fridays, to help with the distribution. And then I deal with the eggs. We have these new, not very great egg containers that they're supposed to bring back every time, these plastic things. But they're not wonderful. I wish we could get the kind that you use for camping. Yeah, oh. Those would be really great. Because they're nice and sturdy. And they can really take some beating. Yeah. And these are more fragile. And because sometimes they come back so dirty, it's like, Oh, yeah. They got like old cooking oil, poured on them, because, you know, no one has any space. Yeah. Yeah, so you use what you've got. And you don't refrigerate the eggs normally. So they're hanging out where everything's happening. I'm really surprised that all these people have kitchens. Because a lot of places don't. And the plumbing is, you know, like, you'll have a row of six rooms, and then down at the end, you'll have a communal washroom. So, you know, a lot of things that we really take for granted. Yeah, aren't simply aren't available to these folks. Like, I've run into beggars before. And I'm like, Do you have a kitchen? They're like, No. So you have to give them ready to eat stuff, not stuff that we give out, which has to be cooked. Yeah. And especially like peas and beans. Yeah, I mean, a cylinder of gas costs 2.50 $3. Now, and usually they don't have hot water. So it's mostly for cooking. Yeah. But I mean, these people, you know, where are they going to scrape up three bucks?

Sam:
Yeah, that's a lot for just one thing.

**Interviewee 2:**

Yeah. And the cylinder usually lasts at least a month. But if you're cooking peas and beans, from start, you know how long that takes? Yeah. And they don't have, you know, like these people have nothing. They have a pressure cooker. Yes. So I've been agitating to switch from, for instance, peas to there's pea flour. Oh, yeah. Which cooks it instantaneously. It makes it delicious soup. Oh, wow. So, you know, these are the sorts of things you have to think about. Yeah. **What's gonna work to them?** Yeah. And it'll make the most of their limited resources. Yeah, of course. So one thing we've kind of been looking at is there's a lot of plastic bag use when you're packaging like the rice and the salt and vegetables as well.

**Sam:**

A few things we have come up with, I just want to like talk through them with you. That's all right. So one is cleaning out and reusing plastic water bottles. To put the salt and the sugar more specifically in. The plastic can be reused, which I didn't think it was, contrary to popular belief. So possibly putting them in there instead of a new bag. Do you have any thoughts? I mean, please, any feedback? Good or bad is very helpful. We're still exploring all these.

**Interviewee 2:**

So yeah, I mean, the little Inka cola bottles, you get these little guys. You know, it's like, what is it? Five, six ounces? Maybe? Yeah. And that would probably be good for, you know the bag once it's ripped open? Yeah, it's open. Yeah. And especially in the rainy season, you're going to have like a glob of salt. Yeah. And that would be an excellent idea for the and then plus, you don't have to tie it, tying it is such a pain. Yeah, so we got, you know, if we're able to get a bunch of soda bottles. That'd probably work really well. I don't know that... We have a problem with them bringing the stuff back. Yeah. And so, but if it's recycled already. Yeah. I don't feel quite as bad. Definitely. Yeah, I just don't know where we'd get a source of that. There's some, I used to work with right pickers in India. And there's a recycling depo near me, a family that works on recycling. I could see if they have... You know, yeah. Could be a source for us. They'd be like two cents a bottle. Yeah.

**Sam:**

That'd be awesome. Yeah. And then the other thing we're working on is actually we're able to make these bags here. You can see it if you want. They're made out of...all it's all made out of is plastic bags. And then it's like a drawstrings you can cinch it Yeah. To store I think we are unsure of how well be for Salt and Sugar may be a bit too fine. But possibly exploring this for the rice or the vegetables, like many different sizes. All it takes to make these is an iron. Yeah, and the bags. Um, how do you think
these would work? And then also, this is something we've been looking for either volunteers to make or seeing about...

**Interviewee 2:**

Getting some of our clients to?

**Sam:**

Yeah, exactly.

**Interviewee 2:**

Interesting idea. Like I say, a lot of stuff comes back really dirty. Yeah. And, you know, the benefit of using the clean bags is that you know, you know, there's no contaminants so that that's my major concern.

**Sam:**

That's a great point.

**Interviewee 2:**

And then trying to get them to return them. Oh, my God. I mean, we're getting really tough now. It's like, if you don't have your bag, you don't get any food. And, you know, it already costs them money to come here on the bus. Yeah. Sometimes they just walk. And you know, I realized that their life is hell. One of the things we're trying to do is gradually outfit them with decent backpacks, to carry the stuff, yeah. You know, a lot of times they just say, “I don't want to take the bag, just put it in my, in my backpack.” But their backpack. Really sad. Because it costs $10 and they last for a very short time. Like I look at your backpack. And think oh, don't you want to leave that here?

**Sam:**

I mean, that's a good point, like that has lasted and will last for years, but they don't have the money to make a big purchase.

**Interviewee 2:**
Yeah, Terry Pratchett makes a really good point about he's a novelist. And he talks about how, you know, this guy gets $35 a week. And he would like to buy a good pair of boots, but a good pair of boots cost $70. And he just can't do it. So he buys crappy pair, which self-destructs in less than a year. And so he's caught in this rat race of trying to buy a pair of boots that will last him for years and years. It's much easier for the rich to cope than the poor because they're condemned to these poor choices.

Sam:

Exactly, yeah. And then last question I have for you is how many plastic water bottles and or plastic bags would you say you're using a week?

Interviewee 2:

Oh, me personally? Yes. Well, no plastic water bottles. Good. Yeah, we recycle everything. Amazing. And we take our own bags to the store. Great. Although every so often, you know you do get stuck. Yeah, definitely. But I wash them and reuse them. Yeah. So like all my Ziplocs, I wash them and reuse. Oh, they probably get at least six years. Yeah, at least.

Sam:

I mean, those things are lasting forever. So it's good. Yeah.

Interviewee 2:

Yeah. I get the good kind, you know. So me personally, and then, like, we do use new trash bags. That says, you know, you got to pull them out. But you have to use something

Sam:

That's unavoidable. Yeah.

Interviewee 2:

So I mean, sometimes I'm like, "Oh, I have no plastic bags." Yeah. You know, like, I want to send home something with my maid.

Sam:
Exactly.

**Interviewee 2:**

So I would say that actually I throw out... Well, the one the raw chicken comes in.

**Sam:**

Yeah. There's nothing to do with that one.

**Interviewee 2:**

The one the raw meat comes in because we have to cut them open because they tie them, we can't get them open. Yeah. So yesterday, I went to the market and I got chicken, and two different kinds of meat. There were three bags. They're not the big ones. Yeah. Skinny plastic. Skinny ones that don't have handles. So that's three right there. But that doesn't happen all that often. The ones that the fruit and vegetables come in, I use it again and again. Yeah. I mean, that's good.

**Sam:**

That's the goal. We want that so yeah. Well, that's all I have. Thank you so much for your time. We really appreciate it.
APPENDIX L: INTERVIEW TRANSCRIPT WITH VOLUNTEER #3

Sam:
Alrighty, so I think I introduced myself earlier, but I’m Sam, again

Interviewee 3:
I’m [Interviewee 3]

Sam:
Nice to meet you. Um, so, to start: what do you think the... where do you think the most plastic waste is produced here, in the Soup Kitchen?

Interviewee 3:
In here?

Sam:
Yes.

Interviewee 3:
Probably the plastic bags. They’re all over.

Sam:
Yeah.

Interviewee 3:
Yeah. Yeah. But they do have lands here where they go
Sam:

Yeah, that’s good. That’s awesome. And then what do you think the biggest areas of inefficiency are in the Soup Kitchen currently? Where it gets clogged or there are a lot of things going on? I mean, you guys have a great set up going. I’m loving it, you guys are flying through those

Interviewee 3:

Yeah, this is like my third or fourth time here so I don’t know if I can speak to that accurately or not. But um, it’s like a conga line everybody doing their own thing. I would say its reasonably efficient.

Sam:

That’s good. I mean, that’s ideal. Awesome that’s great.

Sam:

So some of the things that we’re looking into is changing some of the packaging. So one thing is for the salt and the sugar, you know, those come in big bulk and are put into small bags. And we were considering possibly using clean plastic water bottles to put those into, like using a funnel, putting them in there, and so we can repurpose that plastic instead of using a new one. What do you think about that? Any concerns with that?

Interviewee 3:

No, no. They do something like that with the egg cartons. You know, you bring your egg carton and we give you the eggs to go. But I don’t see why you couldn’t do that with plastic bottles. I guess they would give you smaller bottles and you would wash them out the next day.

Sam:

Exactly.

Interviewee 3:

Yeah, recycling those sort of things makes sense.

Sam:

Yeah. The next concept we had is we learned with like plastic grocery bags you have, you can make this type of fabric with them and you’re able to make these bags. Like they’re like a drawstring type of
bag that you can close. We’re considering possibly using this for the rice and/or the vegetables. The benefits of this are, it’s 100% plastic bags, you just use an iron and that’s it. What do you think about those?

**Interviewee 3:**

That sounds like a good idea. Yeah I think this is a work in progress, you should try this.

**Sam:**

Yeah, everything is going to be trial and error

**Interviewee 3:**

You’ve got a lot of people like here, back home I mean, I’m from Minnesota..

**Sam:**

Oh awesome, I’m from Chicago so right near there

**Interviewee 3:**

Okay, so they had a fairly aggressive recycling program. We set out, and we think they would recycle and leave. We’d like to see that change. That’s a big thing

**Sam:**

Yeah, that’s a big thing. And then, how many plastic water bottles, and how many plastic bags would you say you personally use in a week?

**Interviewee 3:**

A week, okay yeah. So we go to..pretty close to.. We live in a buena vista area. It’s about six blocks. And we use plastic bags and they throw them up like partially and I’ll do mine. Jeez, we use probably ten maybe more. And then that goes out the trash and recycling. This goes into a canyon somewhere
I’m sure. So yeah, we do uh.. My wife drinks a lot of diet coke. Somebody takes those. We put that out early morning. Somebody takes that. Plastic bags.. […]

Sam:
Yeah I mean those are hard. Same in the States, its an issue everywhere

Interviewee 3:
Yeah I mean you’re either killing a tree or clogging up something somewhere

Sam:
Yeah, its inescapable

Interviewee 3, referring to repurposed bags:
Look at these bags, they’re so nice

Sam:
Exactly, yeah. This is what we’re kinda thinking. Our thought process is to possibly replace the rice bags and vegetable bags. Um, all it takes is an iron to make these. And they cinch up, they cinch up like this and hopefully reusable or if not at least its repurposing

Interviewee 3:
So would you just put the raw rice in there?

Sam:
That’s what we’re thinking, but we’re still figuring it out

Interviewee 3, referring to plastic bags of rice:
Yeah because you see..
Sam:

Yeah, so many plastic bags... we’re trying to find ways to be more sustainable.

APPENDIX M: INTERVIEW TRANSCRIPT WITH VOLUNTEER #4

Sam:

So to start off, where do you think the biggest areas of inefficiency are in Soup Kitchen? I mean, that flew by, I don't think there's anything necessarily inefficient about that. But are there any areas that you see kind of clogging up, or things like that?

Interviewee 4:

Inefficiency? Probably storage, places to organize the space, we’re limited and the design the way the... So trying to find the ideal to create almost like a, they call the assembly line type of process. Yeah, this is probably one of the biggest challenges.

Sam:

Yeah. Awesome. All right. And then where do you think the most plastic waste is produced in the operations here?

Interviewee 4:

Of course, it's going to be the bags. Yeah. It's gonna, it's gonna be the bags. Until we, of course, find some way to reuse, recycle, streamline again, but the problem is mostly the durability, because just because you get a bag or can find a bag. It has to be very, very durable and washable if possible.

Sam:

Exactly, your food products. Gotta make sure it's all clean. Yeah, awesome. Um, and then so things that we are considering is possibly some ideas to solve that problem. First thing we are considering is using and cleaning plastic water bottles since something that is just everywhere and possibly using those more for the sugar and salt since they’re more of a thinner thing? What are your thoughts on that? Please? These are...we're very early in this, any positive, negative?
Interviewee 4:
Using what?

Sam:
Plastic water bottles.

Interviewee 4:
Okay. Okay.

Sam:
So being able to clean those out. And then like with a funnel, fill them with how much salt and sugar just we're repurposing the plastic instead of having a new one.

Interviewee 4:
Yeah, that yeah, that sounds good, we had talked a little bit about that from a logistical standpoint, not only for rice and sugar. They all come in bulk. Yeah, a lot of the grains, they come in bulk. So at first we were talking about, I know you've seen those big rain barrels.

Sam:
Yeah.

Interviewee 4:
So we were, we were kind of going over that idea, kind of using the blue type rain barrel. But maybe have one of the locals put some type of release on it. So like with this bag, yes. Go over dump the whole bag of rice. You could fill it up. Yes, yeah, as many bags as you want. And then just let it come instead of scooping and trying to find something you just let it run almost like a funnel thing.

Sam:
That would be great. That’s super… awesome. And then second idea is doing something possibly with these, plastic bags are a problem everywhere. Okay. So by ironing different multiple plastic bags together, you can make kind of a fabric that’s a lot more durable.

And yeah, totally hold that. So we’re considering possibly we can make like, these are drawstring bags that can cinch. And all it takes to make them is an iron. So they’re pretty simple to make. I mean, I just did these together last night in like an hour, but we were in a zoom meeting at the same time, I was multitasking. But um, so what do you kind of think about these? And like, do you see any issues or things that would go with them that you should be considering?

Interviewee 4:

So how many how many layers of bag did you have to use to make this?

Sam:

These two are…we used three bags… folded over so there’s six layers of plastic.

Interviewee 4:

Six layers of plastic, and I guess have you done, kind of, simulated maybe like hand washing them with a wet towel or something?

Sam:

That’s one thing we haven’t done that we definitely need to, the cleaning.

Interviewee 4:

I wonder if it starts breaking?

Sam:

Exactly. That’s a big thing.
But no. Oh, I love this, I definitely love this. Yeah, I guess the strain, I’m thinking in terms of the little ones. The strings make...this more efficient and cheaper. Because if you try to do any type of zipper...maybe, velcro.

Sam:

Oh, Velcro could be cheap too. Yeah, but zippers, we looked at those. Immediately, we're like that is absurdly expensive.

Interviewee 4:

But what were we thinking for the content, rice, something that could stream out or something that would just sit at the bottom?

Sam:

Rice, vegetables... We're thinking either rice and/or the vegetables or we can make them in all sizes. So even if that was for the salt and sugar as well. That one we were a bit more nervous about, the finer grain, it could come out through the top. But, and even just the fabric in general is just you can make easily just a big sheet of fabric. And there's a lot of things that possibly participants could even do with that.

Interviewee 4:

Yes, it's cool. Actually, it'd be cool to teach the locals how to take some of their bags and make something similar.

Sam:

Exactly, yeah. And it's also if they want to sew with it too, it's very easy to like, they can use a sewing needle if that's something they want to learn too.

Interviewee 4:

So it's just ironed, what type of...would you have to coat it with something?

Sam:
No. So all it is, is you need a hard surface, like piece of wood. We've been using the granite countertops in our kitchens. And then you put a piece of parchment paper down, the plastic bags, then another piece of parchment paper then you just iron it. And then you can reuse the parchment paper as well. They just...plastic bags just fused themselves together to make this. Yeah, and then this is just braided strips of plastic. But yeah, the seal as well is just ironing the ends. One thing we were talking about actually, yesterday, we were here as well. And we had our first mockup of these and it held a pound of sugar. No problem. We were honestly kind of surprised with the durability...with the drawstring. Yeah. So we were pleasantly surprised by that.

Interviewee 4:

So when you do the wiping if there's any issue that maybe we can look at doing some type of like, lacquer over the top once we're finished for the weather and on the inside.

Sam:

Oh, that'd be great. Yeah. So well...the last thing is, I mean, do you have any suggestions of any more ways you're trying to make this Soup Kitchen more green? I mean, you guys have done pretty much anything, more than we could even think of, between the diapers, bags, the menstrual products, but is there anything else that you've been thinking about?

Interviewee 4:

No, I think the issue is always the same with us. This is definitely great. But even on some level, we could use a local...locally, but maybe using the, um, bags that the potatoes come in. Yeah, what we've been doing of course is people take them and use them for their garden, gardening stuff, whatever. But, they're pretty huge. Yeah, we can figure out some way to maybe even use those when they come in to create something like that.

Sam:

Definitely, we were trying to mess around with those in the very beginning, but that's a different type of plastic. But that's also still something we don't want to rule out because you guys have a large supply of those and that's prime fabric right there. Yeah.

Interviewee 4:

And other than that, nothing, I guess we keep saying we streamline stuff, but I think it's more...not only like, the bags and stuff is making the system more streamlined. And you know, you notice in the back
we got the bands you know, we put the different quintales and everything that we need on there. But when it comes to the salts, the sugars, if we can figure out a way to just dump bulk.

**Sam:**

That would speed it up so much, that would be amazing, yeah.

**Interviewee 4:**

And you know, with these, I guess the only thing that I would think of is, unless we're still doing something like scooping, is the size of getting your hand and the scoop in here.

**Sam:**

Yeah. That’s a good point.

**Interviewee 4:**

Yeah, love it. Yeah.

**Sam:**

Well that’s all we have. Thank you so much for your time.
APPENDIX N: INTERVIEW TRANSCRIPT WITH VOLUNTEER #5

Sam:
So to start off, what do you think are the biggest areas of inefficiency right now in the Soup Kitchen?

Interviewee 5:
Inefficiency?

Sam:
Inefficiency.

Interviewee 5:
Plastics? Yeah. It takes forever to open the bags up, they tear, and I just hate seeing them.

Sam:
Yeah, exactly. Um, so things that we are considering to try and help solve this problem is...first is trying to repurpose plastic water bottles, more for the salt, sugar, the rice might be too thick. But possibly like cleaning those out and like, with the funnel, filling those instead of doing the smaller bags. Do you see any issues with that? Or if you have any?

Interviewee 5:
No, there's actually all these guys that make just about everything down here, one of the things that they make is for actually, killing a chicken. So it's got this long neck, wide like this, but they put the chicken's neck through it and like break the neck at the top, they'd be perfect for filling water bottles. Or, almost anything because it's got a big wide mouth. Yeah, so funnels are so tight. Yeah, this is nice and big.

Sam:
Yeah, that’d be awesome, definitely something to look into. And then our other idea is creating reusable bags out of plastic bags, here if you'd like to see.
Interviewee 5:

Yeah, I saw that when I walked in.

Sam:

What we’ve discovered is that, yeah, you can make a pretty durable fabric out of everyday plastic bags by just ironing them together. And then so there’s no... it’s all recycled material. Do you see any issues or possible things that we should be considering with these?

Interviewee 5:

No, I mean, we actually get them, the rice comes in the big bags that’s this material. So yeah, we do have a sort of a source for some of it too. Yeah. So yeah, no, I like these. As long as they don’t leak. And I don’t see how rice is gonna escape that.

Sam:

Exactly. Yesterday we were here. And we had, it was like a very rough prototype we even made before these two and it held a pound and a half of sugar. No problem. So we were very pleasantly surprised at how well that was working.

Interviewee 5:

Yeah, so I mean, these put plastic to work, rather than throwing it out...

Sam:

Exactly. We know also, there’s been some issues trying to have people bring back the reusable things, I know you have the egg cartons, and then also the bags, obviously. How have you seen that going so far?

Interviewee 5:

I mean, they're, they're pretty good. I mean, Hearts of Gold staff and Miguel, Miguelito are pretty hard on him when they come in, you know, in this kind of ways, you can be hard on somebody, yes. They're...and they've been doing a reasonable job. We knew that there was going to be when Gary and Barbara and Pam and I decided to do the bags if we can get a good price—we knew there would be breakage. Yeah, that they tear. That's why we bought 500. But so far, it hasn't been a huge bump, just a minor one. And it's about there's only two kinds of errors, right? There's training errors, and there's
hiring errors. And so for us, it’s a training error. If we’re not teaching them enough at the beginning that you need to bring this stuff back, that this is important. You know that, every time somebody doesn’t bring something back, that’s food somebody else doesn’t get. We just need to be better at that. And I think that’s our...I like to take the blame for that ourselves.

Sam:
That makes sense.

Interviewee 5:
I think we’ll get there.

Sam:
Yeah. And then, and I know you guys don’t put, necessarily, food products directly into them. But have you guys had issues with them coming back, like really dirty or washing them? How does that work?

Interviewee 5:
That’s gonna be the trick with the vegetable bags. You know, that’s sort of why we haven’t gotten to those in a cloth bag. Because we do those in a way...I don’t know if you saw those, the potatoes...

Sam:
Oh my god. Yeah, that was a dust cloud.

Interviewee 5:
It’s a dusting. And today was about, a little worse than most. We’ve had it worse than that, but that’s about as bad as it gets usually. But that dust, it just gets in everything. I’ve spent been three days blowing potato dirt out of my nose.

Sam:
Oh my gosh. Yeah.
Interviewee 5:

But I mean, this. This group is family for us.

Sam:

Yeah. It seems like an awesome group. Yeah, it's been great to be a part of it. Um, and then also, kind of separate: how many plastic water bottles and/or plastic bags do you personally usually use within a week?

Interviewee 5:

You know, in a week I think we might get—cause they do all the garbage in these plastic bags...

Sam:

Yes. Because they're gonna need plastic bags for that.

Interviewee 5:

We're probably going through four or five a week at home. And they're all going to garbage. Yeah. But we reuse as much as we can. We have, you know, shopping bags that are cloth. Yeah, we take ‘em with us when we go most of the time, but like you forget.

Sam:

Yeah.

Interviewee 5:

At the beginning, we were terrible. We probably had, I don’t know twenty or thirty of them in the house.

Sam:
That's good. Awesome. Yeah. Awesome. And then, is there anything else here that you think the Soup Kitchen could do to possibly become more green outside of, you know, the plastic use?

Interviewee 5:

I think the main thing that I'd love to see us transition into- and that we're working on-is to have more programs, to, you know, get as good chicks and stuff so people can have a reliable source of eggs. And you know, help them plant on what little bit of land they might have. And to really try to encourage people who are coming to the program, maybe they just need to find a way to come up with some programs like making these [the bags] that they could do. And they can make all sizes and so

Sam:

Yeah, that’s what we’re hoping because I mean, you can make a big sheet of fabric and from there, it's practically free materials for them. So if there's something they can do with that.

Interviewee 5:

Yeah, they could go you could go the feria libre and you could get as many of these bags as you wanted. I mean, there's people trying to get rid of them-when Nancy [volunteer] isn't using them for her nefarious purposes, her yardwork. Yes.
There is one Cuencano who volunteers at the Cuenca Soup Kitchen, referred to here as Volunteer #6. He has volunteered at the Soup Kitchen for the past few years, making and distributing kits. He volunteers every day of packaging and distribution, highlighting his dedication to the Cuenca Soup Kitchen. His input was vital to our project because he knows and cares greatly about the Kitchen. Also, it was important to get a Cuencano’s input on our ideas.

When asked about the areas of plastic waste, this volunteer stated that it was certainly the plastic bags. He emphasized the rice and produce, which are distributed in bags every two weeks. He stated that the Cuenca Soup Kitchen is a very environmentally friendly place, but if there is one area of improvement it would be the bags. He stated multiple times that it was these two areas: the rice and the produce. Everything else has been made environmentally friendly, he said. He explained how they have replaced the food kit bags with tote bags, which recipients sometimes bring back.

Volunteer #6 was shown both the plastic bottles and repurposed bags. He preferred the repurposed bags over plastic bottles because he thought the plastic bottles would be too hard to fill with salt and sugar. He was enthusiastic about the repurposed bags, detailing how many plastic bags it would save.
APPENDIX P: SURVEY OF PLASTIC BAG RESULTS

Survey Question:

1. Más o menos, ¿cuantas fundas de plástico usas en una semana?
   (Roughly how many plastic bags do you use per week?)

Results:

A total of 70 responses were recorded, with answers ranging from 1-20 bags per week. The majority of recipients claimed to use between 3-5 bags on average. (Raw data shown in Table 4)

<table>
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<th>Amount of Bags</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>12</th>
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<td>People who Responded</td>
<td>1</td>
<td>3</td>
<td>21</td>
<td>14</td>
<td>18</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4: Survey data of plastic bag use for participants

Note: These responses include all uses of plastic bags, including shopping bags, trash bags, and miscellaneous uses. Answers are approximate.

APPENDIX Q: INTERVIEW GUIDE FOR ORGANIZATIONS

Invitation: You are invited to participate in an interview regarding waste management systems and sustainability practices. This interview is part of a larger research project conducted through Worcester Polytechnic Institute.

Purpose of Research Study: The purpose of this research is to help the Cuenca Soup Kitchen reduce plastic waste in an effort to become more environmentally sustainable. This research will be published.

Nature of Interview: The interviews will be conducted in a semi-structured, semi-formal manner. Researchers will ask specific, predetermined questions but encourage participants to share any experiences they feel are relevant. Questions will be focused towards the operations of the Cuenca Soup Kitchen and waste generated at the organization. Interviews may take around 30 minutes per person.
Confidentiality: Information collected from interviews will be anonymous. Names and other identifiable information, such as age or address, will not be shared nor recorded.

Participation in this research study is completely voluntary. Refusal to participate will not result in any penalty to you, and you may decide to stop participating in the research or skip any questions at any time without penalty.

We encourage you to ask any further questions you may have about the research before we begin. For more information about this research or about the rights of research participants, or in case of research-related injury, contact:

Lali Berelashvili
Samantha Braun
Cal Lebak
Colette Webster

at: gr-soupkitchen-c22@wpi.edu

Gary Pollice:

gpollice@wpi.edu

Esther Boucher-Yip:

efboucher@wpi.edu

Interview Guide

Questions for local organizations:

- What does “sustainability” mean to your organization? What do you think of when we say the word?

- How important is it for your organization to “go green”? Has your organization taken any steps to be more sustainable?
  - If so:
    - What has been the biggest challenge in implementing sustainable practices?
What resources has your organization utilized to “go green”? How did you hear of these resources?

Which resources were the easiest to work with (i.e., easy to implement, low cost)?

○ If not:

What do you think is the biggest reason for hesitancy towards going green (i.e., budget, time-consuming, etc.)?

Are there any resources you know of that you would recommend to another organization trying to implement sustainable practices?

APPENDIX R: BEYOND HUNGER INTERVIEW

Beyond Hunger is an organization located just outside of Chicago, Illinois whose main function is that of a food pantry. They started over 40 years ago with minimal budget and resources. Then in 2008 they expanded rapidly due to the increased need during the recession, serving around 100 people a month with a forty thousand dollar yearly budget. Since then they have grown exponentially adding additional programs and services to help people in need. They now have a budget of over three million dollars and serve over forty thousand people in 2021. They are an impressive example of a food pantry’s growth and have overcome many obstacles over time, and the lessons they learned can help the Cuenca Soup Kitchen grow.

Originally Beyond Hunger used a client choice model to distribute food, meaning that the pantry was set up similar to a grocery store for participants to travel through. However due to the recent COVID-19 pandemic they had to adjust to a drive through model where participants received prepackaged boxes instead. To their surprise they learned that people preferred this method. This model is the same as the Cuenca Soup Kitchen (except participants walk up instead of drive). This is good because it reinforces the way in which the Cuenca Soup Kitchen currently handles operations.

Beyond Hunger receives their food from a wide variety of sources. Most of their non-perishable foods come from food banks designed to provide food to food pantries. Their perishables however are much easier to buy and also come from local donations. Local grocery stores and bakeries work with them to provide food that can no longer be sold but is not yet bad. One way Beyond Hunger inspires food donations in their toughest financial season (the spring) is through a challenge they started with the local school district where schools compete to see who can receive the most donations. The winning school then gets a trophy and their picture in the local newspaper. Finally, they also do a lot of work with local congregations for monetary donations, food donations, and volunteers.

While Beyond Hunger has a similar endeavor for sustainability as the Cuenca Soup Kitchen, they face many of the same issues. Beyond Hunger’s gathering of food from grocery stores and bakeries is sustainable in itself as it reduces the amount of food waste created. They have also provided reusable bags to all of their clients and encourage people to bring them back by offering one extra item per bag, and this program has been successful. The “extra” items are usually extraneous items they receive
through donations that they may not have enough for everyone. In our interview Michele stressed that the use of incentives has been very helpful for them. They additionally use the municipal compost system to dispose of any bruised/unsusable foods they receive as well as cardboard. Despite all of these efforts, Beyond Hunger still faces the same main sustainability struggle as the Cuenca Soup Kitchen - plastic food packaging. The use of plastic bags is easy, cheap, and common - and they have not yet found a good solution.

Beyond Hunger attributes the growth of their operation to the sense of community and the growth of their budget. Michele stated that they needed to “find the money first then grow the program”. They have been successful in applying for grants. Additionally, they receive large monetary donations from large corporations, local governments, local businesses, congregations, and individuals. Many large companies will match donations of their employees to the organization of their choice.

Finally, Beyond Hunger has faced the struggle of space constraints. Many years ago, they had an architect who was a volunteer do an analysis of the facilities to make the most efficient use of the space. As they have grown they have looked to the community to share space, such as schools and congregations.

APPENDIX S: INTERVIEW GUIDE FOR STAKEHOLDERS

Invitation: You are invited to participate in an interview regarding your opinions on potential changes within the Cuenca Soup Kitchen. This interview is part of a larger research project conducted through Worcester Polytechnic Institute.

Purpose of Research Study: The purpose of this research is to help the Cuenca Soup Kitchen reduce plastic waste in an effort to become more environmentally sustainable. This research will be published.

Nature of Interview: The interviews will be conducted in a semi-structured, semi-formal manner. Researchers will ask specific, predetermined questions but encourage participants to share any experiences they feel are relevant. Questions will be focused towards the operations of the Cuenca Soup Kitchen and waste generated at the organization. Interviews may take around 30 minutes per person.

Confidentiality: Information collected from interviews will be anonymous. Names and other identifiable information, such as age or address, will not be shared nor recorded.
Participation in this research study is completely voluntary. Refusal to participate will not result in any penalty to you, and you may decide to stop participating in the research or skip any questions at any time without penalty.

We encourage you to ask any further questions you may have about the research before we begin. For more information about this research or about the rights of research participants, or in case of research-related injury, contact:

Lali Berelashvili
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Cal Lebak
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at: gr-soupkitchen-c22@wpi.edu

Gary Pollice:
gpollice@wpi.edu

Esther Boucher-Yip:
efboucher@wpi.edu

Interview Guide

Questions for recipients:

- One way the Soup Kitchen may change is though (explanation of suggested change). How do you think that (suggested change) would impact the Soup Kitchen’s functions?
- Would you feel comfortable using (current service) if it were (suggested change)?

Questions for staff and volunteers:

- How do you think (suggested changes) aligns with your mission statement?
- How do you think (suggested change) would affect the upper-level workings of the organization (i.e., management)?

Is there anything about (suggested change) that you are particularly hesitant about
How to Make: Repurposed Rice Bags

Step 1: Flatten and Cut Bags
Flatten and straighten both bags as best as possible. Cut off the bottom seam and handles. Cut ONE side seam of bag.

Step 3: Iron Bag
Place wax paper over the folded bag. With iron on cotton setting, iron across the wax paper. This process typically takes 3 minutes.

Step 5: Iron Middle Seam
Place a folded piece of wax paper in the middle of the fabric, and wrap the fabric around it. Place a piece of wax paper on top and iron the middle seam only, as depicted by the dashed line.

Step 7: Final Touches
Remove wax paper from inside the bag, and cut top to be as straight as possible. Sew zipper on top edge. You now have a repurposed bag!

Step 2: Refold Bag
Unfold one bag. You should have one long piece of plastic as shown below. Refold the bag in half such that all markings are now on the inside.

Step 4: Fuse Both Bags
Unfold the second bag from step 1, and place your fused bag in the middle as shown below. Place wax paper over the bags and iron as you did in step 3. When finished, flip bag over and place wax on other side. Iron again.

Step 8: Iron Bottom Seam
Fold bottom of bag over itself, as shown below. The fold will become the seam. Ensure wax paper is NOT in the folded portion. Cover the entire bag with wax paper and iron over the bottom seam only, as depicted by the dashed line. Do not iron the rest of the bag. Flip bag over and repeat on other side. Iron bottom corners of bag.

Tips
- Do not place iron directly on plastic bags
- Rips can be patched by ironing plastic over the rip
- Wax paper can be reused to make multiple bags
- Using more than 2 plastic bags will result in a thicker fabric
- Paying extra attention to corners and seams will help prevent tears and rips

Figure 19: An infographic on how to make the rice bags was delivered to the Cuenca Soup Kitchen
APPENDIX U: LINK TO VIDEO OF BAG INSTRUCTIONS

https://youtu.be/Hclnihsfy2A