



# WPI

## FACILITATING THE DEVELOPMENT OF A WOMEN'S RECYCLING COOPERATIVE IN CAPE TOWN, SOUTH AFRICA

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

**Submitted on:**

December 12<sup>th</sup>, 2019

**Submitted by:**

Katherine Martin

Nicholas Rath

Shane Villafana

Charlotte White

**Submitted to:**

Professor Melissa Belz, PhD

Professor Thidinaleni Tshiguvho, PhD

Cape Town, Project Center

In Cooperation With

Blue Sky Recycling

This report represents the work of four WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review. For more information about the projects program at WPI, please see: <http://www.wpi.edu/Academics/Projects>

## Abstract

---

Like many countries today, South Africa faces systemic gender inequality. Many women not only face discrimination at home, but also struggle to find job opportunities to provide for themselves and their families. This project aimed to empower women by assisting Blue Sky Recycling, a local business in Philippi, Cape Town, to create a women's recycling cooperative. After conducting interviews with local cooperatives, we developed weekly workshops for the cooperative members to train them on how cooperatives function. Our group found that the key aspects of successful cooperatives are trust between members, open communication, and an understanding of business operations. Cooperatives can empower their members and communities, improving living conditions and alleviating widespread poverty.

## Acknowledgements

---

We would like to acknowledge the numerous people who were crucial in helping us complete our project in Cape Town, South Africa.

- Professor Melissa Belz, our IQP advisor
- Professor Thidi Tshiguvho, our IQP advisor
- Professor Scott Jiusto, the co-director of our project site
- Professor Gbeton Somasse, the co-director of our project site
- Blue Sky Recycling, our sponsor
- Gershwin Kohler, founder and director of Blue Sky Recycling
- John McKerry, the daily operations manager of Blue Sky Recycling
- Bronté Moeti, employee of New Earth Projects and one of the cooperatives' founding members
- Juliana Lakey, employee of Blue Sky Recycling and one of the cooperatives' founding members
- Thandiwe Munde, employee of Blue Sky Recycling and one of the cooperatives' founding members
- Jonathan Fortuin, employee of Blue Sky Recycling and one of the cooperatives' founding members
- Our various interviewees and workshop attendees
- The community of Cape Town

Thank you all for assisting us in completing our project and making our time in Cape Town a truly memorable experience.

## Executive Summary

---

### Background

In the poverty-stricken townships of Cape Town, South Africa, living conditions are less than ideal. Unemployment rates are extremely high, especially among the female population as women are often discouraged from holding jobs. Severe overcrowding and the high cost of waste management combined with unemployment means that most residents are unable to properly dispose of their waste. Therefore, the societal norm is for waste and recyclables to be mixed and dumped into the streets. Not only is this detrimental for the health and well-being of the residents, but it also has a significant impact on the environment.

Our sponsor, Blue Sky Recycling, is a company based in Philippi, Cape Town, that works to combat unemployment and waste management issues. They provide job opportunities by purchasing and collecting waste from thousands of informal waste pickers who find recyclables left in the streets and bring them to Blue Sky to be properly processed. This business provides income to thousands of people and incentivizes the community to work to clean its environment. Gershwin Kohler, the founder of Blue Sky, wishes to create more job opportunities for underprivileged women and increase their community engagement through the recycling industry.

Mr. Kohler wants to achieve this by establishing a women's recycling cooperative. The cooperative model is ideal

because it promotes equality and inclusivity. Although cooperatives have a high failure rate in South Africa, Mr. Kohler hopes to ensure the cooperative's success by acting as a supervisory figure in its early stages. He hopes his initial funding, support, and mentorship will help the cooperative grow and develop into a self-sustaining enterprise. Mr. Kohler has tasked the team with developing a cooperative structure suitable for the group. This project was designed to assist Blue Sky with facilitating the start-up of this women's recycling and upcycling cooperative.



**Figure 1: Philippi township in Cape Town.**

## Objectives

In order to achieve our goal, our team has addressed the following objectives:

1. Assess Blue Sky's current operations and business goals
2. Determine the most effective member structure to promote the long-term sustainability of the cooperative
3. Establish a feasible business model and constitution to register the cooperative as a legal entity
4. Determine profitable materials for upcycling, methods to process materials, and markets for reselling upcycled products

## Methodology

The team conducted a semi-structured interview with the founder of Blue Sky Recycling, Gershwin Kohler, and the operations manager, John McKerry, to learn about their current operations and personal goals for the cooperative. We also met with the women selected to be the founding members of the cooperative to learn about their skills, expectations, and concerns.

In order to gain insight on different cooperative models, we conducted semi-structured interviews with four successful cooperatives operating in Cape Town: Cape Carpenters and Woodworkers, Customer Owned Cooperative, Thinana Recycling Cooperative, and the Brewer's Co-op. We used online research to examine additional cooperative models. The team also reviewed online interviews from cooperatives in Cape Town, namely the Fingerprint Cooperative in Elsies River. We

conducted weekly training sessions with the members to provide them with background information on cooperatives necessary to make business decisions. The team also offered the members recommendations based on insight gained from other cooperatives.



**Figure 2: A picture from our third training session featuring one of the founding members, Bronté Moeti (far left), and three cooperative members.**

The team used online research to learn about the cooperative registration process and obtain the legal documents necessary for registration. We worked with the founding members in weekly meetings to complete the forms and establish a constitution outlining the cooperative's structure. The team examined the different choices made by each of the cooperatives we interviewed for the constitution elements and

analyzed the advantages and disadvantages of each option. We used this information to provide recommendations to the cooperative members.

Finally, we investigated the feasibility of establishing an upcycling branch to maximize profits. The team visited public and private markets around Cape Town to examine upcycled goods produced by other businesses. We conducted semi-structured interviews with these upcycling businesses both at markets and via email to learn more about the upcycling industry. We emailed public and private markets around Cape Town to determine the cost of renting a trading stall. We also investigated the costs of selling online through e-commerce markets and personal websites.

## Discussion & Recommendations

We found that Blue Sky will support the start-up of the cooperative by providing it with funding in its early stages. Mr. Kohler will continue supporting the cooperative until it breaks even and begins netting profits. This support will include securing a workspace, providing start-up capital, securing stable prices and markets for materials, and providing on-going mentorship. Because many cooperatives fail due to a lack of long-term support, we believe this partnership is incredibly important in ensuring the cooperative's success. However, if the cooperative requires additional funds in the future, we recommend it apply for grants from the Black Economic Empowerment program and the Isivande Fund, a program that provides financial assistance to businesses run predominantly by women.

Through our interviews of local cooperatives, we found that there are many elements necessary to achieve success. These elements include a thorough understanding of the cooperative model, obtaining substantial funding, developing business and leadership skills, forming strong interpersonal relationships, providing incentives to work hard, and gaining a thorough understanding of the industry in which the cooperative operates. Incentivized payment systems, training, and strong interpersonal relationships were the most frequently discussed elements for success. We recommend the cooperative run interactive training programs and provide handbooks teaching new members about the cooperative structure and basic recycling processing.

Many cooperatives claimed that mutual trust and respect among members is one of the most important aspect of a successful cooperative. A cooperative can only operate successfully if all members have equal power and work together. During our workshops, we promoted these values by encouraging the founding members to lead group discussions and make important business decisions. This allowed everyone to bond and raised interest in starting the cooperative. Our team recommends that the cooperative stay welcoming to new members and empower new members through mentorship and skills training. Furthermore, partnering with the women of Sizakuyenza, a women's shelter neighboring Blue Sky, can provide the women with job opportunities to change their lives and will provide the cooperative with dedicated new members.

When forming the cooperative's constitution, we reviewed the advantages and disadvantages of having a Board of Directors, selling member shares, and requiring entrance fees. A Board of Directors can speed up decision-making but does not allow every member to vote on each issue. Member shares can increase capital but can potentially lead to inequality if members own very different percentages of shares. Entrance fees can reduce the number of applicants but ensure potential members are serious about the cooperative. Our team also reviewed different options for incentives and grounds for dismissal in order to motivate members to work hard. Some incentives include bonuses and pay systems that rewards a higher level of work. Grounds for dismissal can include stealing, not participating in work, or not attending meetings.

Through investigating the upcycling industry, we learned that some options for upcycling require low investments and are easy to make, such as art and houseware goods while other upcycled goods require a much higher level of investment to produce. The team assessed the feasibility of investing in an on-site recycling system per the request of Bronte Moeti, one of the cooperative's founding members. We used a website called Precious Plastic to research the system and obtained quotes on machine costs. The system can be used to melt down plastic into new forms using molds. Three different machines can be used to process plastic: an extrusion machine, an injection machine, and a compression machine. These systems range from approximately R40,000 – R60,000.

Upcycling would be beneficial for the cooperative to begin using once they are well established and a fully functioning business. Low-investment options should be pursued initially to gain familiarity with the upcycling industry. The cooperative should wait until it has a steady flow of profits before investing in an on-site recycling system. The cooperative should also network with other upcycling companies and organizations to learn more about the upcycling industry and methods of production.

The team hopes the cooperative members find the information in this report useful. We believe our recommendations will help members form a self-sustaining and long-lasting cooperative that will have a significant impact on the Philippi community through job creation and environmental remediation. We hope that members experience the benefits of the cooperative model and can teach their communities how it can be utilized to reduce poverty and promote equality for society's most disadvantaged groups.



## Authorship

<b>Section</b>	<b>Writer(s)</b>	<b>Editor(s)</b>
Abstract	Rath	All
Executive Summary	All	All
Introduction	White, Martin	Rath
Background		
Inequality, Poverty, and Unemployment in South Africa	White	Rath
Economic Empowerment Through Cooperatives	White	Rath
Gender Inequality in Cooperatives	White	Rath
Causes of Cooperative Failure	White	Rath
Keys to Success for Cooperatives	Rath, Martin	Rath, Villafana
Status of Cooperatives in South Africa	White	Villafana
Waste Management in South Africa	Villafana, Martin	Villafana
Benefits of Upcycling	White	Villafana, White
Blue Sky Recycling	Martin	Martin
Methodology		
Objective 1	Martin	All
Objective 2	White	All
Objective 3	Villafana, White, Rath	All
Objective 4	White	All
Results and Discussion		
Blue Sky Recycling's Operations	Villafana, White	All
Variations in Cooperative Structures	Rath, White	All
Training Workshops and Member Meetings	Martin, Rath	All
Recycling Industry and Upcycling	Villafana, White	All
Recommendations		
Cooperative Structure	Rath, Villafana	All
Sustainability of the Cooperative	Martin	All
Upcycling and Future Pursuits	White	All
Conclusion	All	All
Bibliography	All	All
Appendices	All	All
All photos by authors unless otherwise indicated		



## Table of Contents

---

Abstract.....	i
Acknowledgements.....	ii
Executive Summary.....	iii
Authorship.....	vii
1.0 Introduction.....	1
2.0 Background.....	2
2.1 Inequality, Poverty, and Unemployment in South Africa.....	2
2.2 Economic Empowerment Through Cooperatives.....	3
2.3 Gender Inequality in Cooperatives.....	3
2.4 Causes of Cooperative Failure.....	3
2.5 Keys to Success for Cooperatives.....	4
2.6. Status of Cooperatives in South Africa.....	5
2.7 Waste Management in South Africa.....	6
2.8 Benefits of Upcycling.....	7
2.9 Blue Sky Recycling.....	7
3.0 Methodology.....	9
3.1 Objective 1: Assess Blue Sky’s current operations and business goals.....	9
3.2 Objective 2: Determine the most effective member structure and business model to promote the long-term sustainability of the cooperative.....	10
3.2.1 Examining Cooperative Models.....	10
3.2.2 Facilitating Training Workshops.....	11
3.3 Objective 3: Establish a feasible business model and constitution to register the cooperative as a legal entity.....	12
3.4 Objective 4: Determine profitable materials for upcycling, methods to process these materials, and markets for reselling upcycled products.....	12
4.0 Results and Discussion.....	14
4.1 Blue Sky Recycling’s Operations & Cooperative Goals.....	14
4.2 Variations in Cooperative Structures.....	15
4.3 Training Workshops & Member Meetings.....	18
4.3.1 Social Aspects.....	18
4.3.2 Business Aspects.....	19

4.4 Recycling Industry and Upcycling .....	20
4.5 Recommendations .....	22
4.5.1 Cooperative Structure .....	22
4.5.2 Sustainability of the Cooperative .....	23
4.5.3 Upcycling and Future Pursuits .....	25
5.0 Conclusion .....	26
Bibliography .....	27
Appendices.....	30
Appendix A: Administrative Structure of Worcester Roots .....	30
Appendix B: Sector Analysis of Cooperatives in South Africa .....	31
Appendix C: BSR Interview Questions .....	32
Appendix D: Cape Town Cooperatives Interview Questions .....	33
Appendix E: Elements for Successful Cooperatives.....	34
Appendix F: Recycling Handout.....	35
Appendix G: Material Prioritization .....	36
Appendix H: Upcycling Companies Interview Questions .....	37
Appendix I: Upcycled Goods .....	38
Appendix J: Private Markets .....	39
Appendix K: Online Markets .....	40

## 1.0 Introduction

---

Post-apartheid South Africa experiences some of the highest rates of poverty and unemployment in the world. Although racial segregation is no longer legally enforced, the legacy of apartheid has made it increasingly difficult for black and colored South Africans to improve their socioeconomic status. Many of these individuals live in underdeveloped urban townships on the outskirts of South African cities such as Cape Town. Excessive overcrowding in these townships leads to problems with waste management. Residents are often unable to afford waste removal services, resulting in waste building up in the streets and a lack of proper recycling opportunities (Fair Plastic Alliance, 2019). Waste buildup not only leads to poor living conditions but is also detrimental to the environment. To address these issues, as well as to reduce high unemployment, low-income residents often resort to waste picking as a source of income. Many Cape Town residents make their livings as waste pickers by collecting and selling recyclables, however they are often subjected to poor treatment and judgement.

Blue Sky Recycling is a company in Cape Town whose mission is to address both waste management and community development. The company hires waste pickers from the informal settlement of Philippi where it is based. Philippi is located about 24 km southeast of downtown Cape Town. Currently, Blue Sky hopes to expand its operations by starting a women's upcycling cooperative in Philippi utilizing plastic, paper, and other waste materials. Blue Sky would also like the cooperative to incorporate upcycling methods to increase the profits generated from the collected materials and further contribute to environmental sustainability. Blue Sky hopes to empower female cooperative members and waste pickers because women experience a higher level of inequality and unemployment than their male counterparts (Wonci, 2017) Cooperatives offer many benefits including increased political, social, and economic power that can bring communities out of extreme poverty (Kanyane, 2015). Although there are many cooperatives in Cape Town, and in South Africa in general, they have a high failure rate primarily due to lack of access to various resources such as capital and support networks. The goal of this project was to analyze successful cooperatives and apply these models to establish a self-sustaining women's upcycling cooperative in Philippi, Cape Town, South Africa.

The following report includes a background chapter detailing the current status of inequality in South Africa as well as the effectiveness of cooperatives in addressing inequality and promoting inclusivity. We further discuss waste management issues and the creation of economic opportunities within the recycling sector. Our team presents Blue Sky Recycling's work and influence on the community and the company's goals for the cooperative.

The next section discusses the team's objectives and methods to achieve those objectives. We focused on assessing Blue Sky's goals for the cooperative. The team used interviewing and training workshops to determine the most effective cooperative structure. We also analyzed an appropriate business model to register the cooperative as a legal entity. Additionally, the team

researched upcycling processes and markets to assess the feasibility of establishing an upcycling branch.

The final section details the team's findings and results deduced from approaching our objectives. We describe possible limitations to the data obtained and offer recommendations to the cooperative members about how to proceed operations in the future.

## 2.0 Background

---

### 2.1 Inequality, Poverty, and Unemployment in South Africa

South Africa has one of the highest wealth inequality and poverty rates in the world (Sehume, 2018). Thirty million people, approximately 50% of the population, live below the national poverty line of approximately 68 USD (ZAR992) per person per month (The World Bank, 2018). The rate of unemployment was 27.6% at the end of 2017 and hit 29% in July of 2019 (Trading Economics, n.d.) with 3.3 million individuals between 14 and 25 unemployed (Sehume, 2018). Inequality is exhibited by the large wage gap, with chief executives of corporations earning 541 times more than the average employee (Sehume, 2018). Additionally, the Gini coefficient for South Africa, a measure of inequality, of 62.5 was the second highest in the world behind Lesotho as of 2013 (Central Intelligence Agency, n.d.).

The World Economic Forum Report identified South Africa as one of the worst performing countries in education in the world (Nyoka, et. al., 2014). The legacy of apartheid continues to perpetuate unequal access to quality education based on race and socioeconomic status. Poorer high schools experience a much higher dropout rate, lowering youths' access to career opportunities (Nyoka, et. al., 2014). As sectors employing low-skilled labor have shrunk while those demanding high-skilled labor are on the rise, quality education has become necessary for employment and wealth generation (World Bank, 2018). Additionally, the lack of social capital of black youths in comparison to their white counterparts makes them less likely to find employment when it is available (Nyoka, et. al., 2014). Thus, racial inequality persists as these conditions make it increasingly difficult for poor black and colored South Africans to move up in socioeconomic status.

Additionally, South Africa has a long history of gender discrimination that has made women more vulnerable to inequality, experiencing a higher rate of unemployment in comparison to men (Wonci, 2017). The Global Work Report for 2018/2019 reports that women earn an average of 28% less than their male counterparts and women are often involved in unpaid work in South Africa (Wonci, 2017). Inclusive business structures like cooperatives can promote equality and reduce women's unemployment.

## 2.2 Economic Empowerment Through Cooperatives

Throughout history, many disadvantaged groups have used the cooperative model as a means of empowerment through increased social, economic, and political power (Kanyane, 2015). Cooperatives decentralize capital and profit and aim to spread business ownership to as many people as possible (Kanyane, 2015). Structured on socialist fundamentalism, cooperatives are democratically run enterprises that empower members and provide them with opportunities for economic growth that could not be achieved by a single member alone, maximizing members' economic opportunities and power (Kanyane, 2015). The cooperative model allows for pooling of capital and creation of community networks, promoting capital circulation within local economies (Sehume, 2018). Cooperatives offer greater legal protection for members, increased bargaining power, community participation, and stability through risk sharing (Institute for African Alternatives, n.d.). Cooperatives are powerful in their ability to extricate communities from poverty, decreasing unemployment and generating lucrative jobs (Rena, 2017).

## 2.3 Gender Inequality in Cooperatives

Although cooperatives are effective in promoting equality, women remain under-represented as employees, members, and leaders (COOP Africa, 2007). For example, in Ethiopia, only 18% of cooperative members are women and in Uganda, 33% of board members, 13% of chairpersons, and 12% of managers are women (COOP Africa, 2007). Additionally, achieving equal and active participation of women within the cooperatives is a major challenge (COOP Africa, 2007). This is due to sociocultural and structural issues including unequal access to resources, education, and training, unequal distribution of labor between women and men, and gender role stereotypes which favor men for business positions (COOP Africa, 2007). However, women's involvement in cooperatives is beneficial to business, resulting in high returns as well as poverty reduction and development within the community (COOP Africa, 2007).

## 2.4 Causes of Cooperative Failure

Although cooperatives can be incredibly effective in promoting equality and bringing communities out of poverty, they face a high failure rate around the world. Cooperative failure often occurs when a business is provided funding and start-up capital without other long-term support in place, like mentorship or training programs (Strydom, W. & Godfrey, L. 2015). If cooperative leaders have little business experience, they struggle to form effective cooperative structures. Education and training should be provided to managers, elected representatives, and employees for the development of technical, business, and financial skills (Strydom, W. & Godfrey, L. 2015). Because every member gets to vote on business decisions and detailed planning is crucial in ensuring long-term growth, it is important that all members are taught foundational business skills in order to make informed decisions and maximize profits (Rena, 2017). Additionally, it is important that the cooperative grows slowly, gradually expanding infrastructure to meet its needs (Strydom, W. & Godfrey, L., 2015). Often loans, grants, and infrastructure

provided by the government or other organizations can be detrimental to the operation, causing it to grow too fast and preventing self-sustainability (Strydom, W. & Godfrey, L., 2015).

Member dynamics are crucial in running a successful cooperative. Members need a shared vision, strong social links, and financial trust (Rena, 2017). Poor leadership and failure to collect regular membership fees can lead to collapse (Rena, 2017). As total independence and self-sufficiency is difficult to achieve, cooperatives must work with other businesses and establish networks among other cooperatives, gaining resources from community ties (Kanyane, 2015). Additionally, members need to understand that cooperatives are not a quick fix solution and require time, hard work, and financial sacrifice in order to gain profitability (Kanyane, 2015).

## 2.5 Keys to Success for Cooperatives

One way to further understand how cooperatives function is to look at local cooperatives that have been successful in their respective endeavors. One cooperative that has had a great deal of success is Worcester Roots based in Worcester, Massachusetts, USA. Their main goal is to help new and existing cooperatives incorporate and provide ongoing training to be able to sustain themselves. In addition to this, they incorporate youth into promoting environmental justice initiatives and making their neighborhood a safer and greener place. They do this by promoting the development of a green economy and establishing economic solidarity between other local cooperatives.

One aspect of their cooperative that they claim is an essential factor in their success is a horizontal management structure. Like many other successful cooperatives, their workers form a staff collective where each person has equal power and a fair distribution of compensation (Worcester Roots, 2019). However, they are still overseen by a Board of Directors who share an equal voice. Appendix A shows a diagram of how their administration functions and how it is composed. A horizontal staff collective structure makes running a cooperative more equitable and flexible for its members. Since each member has the same basic duties, work schedules become more flexible. Each member performs their own specific duties in which they are skilled, but by giving each member knowledge of how to perform the tasks of other members, the cooperative does not have to rely on a few individuals who are the only ones who know how to perform a specific task. Having this structure gives workers the ability to cover for each other if someone is absent while also providing them with more skills (Worcester Roots, 2019).

Another key aspect that makes local cooperatives such as Worcester Roots successful is that they incorporate into their administration all types of members of the community that they serve. For instance, their Board consists of youths and adults who live in Worcester and community members who have been affected by the injustices that Worcester Roots aims to address. This benefits the cooperative in a multitude of ways. First, it helps encourage the people of the community to have a sense of ownership of the cooperative, especially the specific groups that the cooperative is trying to help. If members feel that they have control over the cooperative, then they will be more enthusiastic and involved in the cooperative's programs and initiatives (Worcester

Roots, 2019). Giving every type of community member a role in the administration also helps build a sense of trust between them and the cooperative. Not only does it help build trust between the community and the cooperative, but it also helps empower each and every member of the community.

Another successful cooperative local to Cape Town is Cape Flats Honey, a beekeeping cooperative and honey distributor. Cape Flats Honey was founded by four people - a single mother, a high school dropout, and two people who had never been able to hold stable jobs. Members of the surrounding community completely own and operate the cooperative, and the only restriction on membership is that one must be over the age of 18 and live close enough to the headquarters to come to work. They welcome every potential employee, despite their background and work history, and they provide everyone with the exact same training and resources in order to give all employees an equal playing field on which to begin their work. The cooperative requires members to always treat each other with dignity and respect to keep the atmosphere friendly and non-competitive so all members can contribute and feel included. Cape Flats Honey workers have a new sense of purpose and humanity after being hired since they have an opportunity to hold a stable job while providing a product to the community. This cooperative has remained successful and influential in its neighborhood years after opening because it remains profitable without sacrificing its sense of inclusivity and openness. Furthermore, cooperatives such as Cape Flats Honey remain a positive presence in their surrounding communities by creating new jobs for those who may never have had such opportunities before.

## 2.6. Status of Cooperatives in South Africa

Although many cooperatives have been effective in reducing inequality and empowering communities across the world, cooperatives in South Africa face many challenges that hinder their success. At the end of apartheid, the government legislated many acts that aided in funding and supporting black cooperatives (Kanyane, 2015). Although this legislation allowed the diversification of the cooperative sector, there was no training or education on how to properly run a cooperative (Kanyane, 2015). This lack of knowledge led to unrealistic expectations as members viewed cooperatives as get-rich-quick schemes, eventually becoming discouraged and demotivated when this was not the case (Kanyane, 2015).

These expectations led to a steep increase in registered cooperatives. From 1994 to 2009, the number of registered cooperatives dramatically increased from 1,444 to 22,619 (Institute for African Alternatives, n.d.). However, only 2,644 of these cooperatives were operational and members only earned an average of 9 USD (R133) per month (Institute for African Alternatives, n.d.). In 2017, there were an estimated 43,063 cooperatives in South Africa; however, these cooperatives faced a failure rate of between 70-98% depending on the sector (Rena, 2017) (See Appendix B). This failure rate is primarily due to lack of access to capital, credit, skilled members, market share, and support networks between cooperatives (Institute for African Alternatives, n.d.).



## 2.7 Waste Management in South Africa

As one possible opportunity for employment, many men and women in South Africa make their livings as trash pickers, collecting, sorting, and selling recyclable material from the streets for profit. Improper waste management and lack of garbage disposal are both extremely prevalent in the heavily populated city of Cape Town. There are only three major operational landfills that service all 3.7 million residents, a 1.2 million person to landfill ratio (Cosmo et al., 2013). For comparison, New York City utilizes 27 landfills for a population of 8.6 million, which is a 320,000 person to landfill ratio (Cosmo et al., 2013). There is simply not enough space in Cape Town's landfills for all residents to deposit their garbage, and therefore it is very expensive to hire trash removal or recyclable material removal services. This is an expense that is generally not feasible for most residents of informal settlements due to wide-scale unemployment and very low average income (Happening in Cape Town township: a recycling hub for women and youths, 2019).

As a result, a large percentage of trash ends up being dumped on the streets of Cape Town, particularly in the informal settlements. It is simply easier for people to dump their garbage instead of walking it to the landfills themselves or leaving it in their homes or places of business, so it has become a part of informal settlement culture to leave trash in communal areas and streets. This contributes to poor living conditions for the residents and leads to the abandonment of many recyclable materials that were not sorted out. Trash that is left in the streets usually contains 15-20% recyclable materials, which simply go to waste. This defeats the purpose of the items being recyclable in the first place (Cosmo 2013). Many citizens of Cape Town's informal settlements have turned the trash and recyclables that are abandoned in the streets into a source of income through collecting recyclables, solving two prominent problems at once: unemployment and poor garbage disposal.

In Johannesburg, a large city in South Africa, collecting recyclables has become a popular job for many of the people living in informal settlements. There are an estimated 20,000 "reclaimers" working to make a living, cleaning the city, and benefitting the environment (Living Off Trash, 2019). These independent workers recycle up to 90% of plastic and packaging in the country, saving the government up to 50.3 million USD (R750 million) in landfill costs (Living Off Trash, 2019).

Trash pickers and sorters offer a valuable role in society, but their job is not being appreciated by the community. Because of the high crime rate, gated residences and businesses often have hired security. Pickers, who are legally allowed to go through trash bins outside of a property, are viewed as a threat and harassed by security, the police, and even residents themselves (South Africa, 2019). Waste pickers are told they are disturbing people, not allowed to use public restrooms in the malls, and kicked out of public spaces. It bothers these people that they are perceived in a bad light for trying to make a living (Living Off Trash, 2019).

This fear is often justified by the amount of crime in the country; however, the harassment continues even off the job. Michael Machine, one of the countless men living at a Johannesburg

pickers camp, says, “A lot of people don't like what we are doing. They think we are criminals because our clothes are dirty” (South Africa, 2019). Furthermore, their belongings, including ID documents and clothes, are regularly destroyed during evictions and raids as another man from the camp tells, “The police often come and burn and destroy all our things” (South Africa, 2019). In the South African government, members of the Committee for Environment and Infrastructure Services repeatedly ignore the requests to have a conversation with the local waste pickers (Tensions, 2019). Many of the people who receive this treatment believe that the government is trying to push away poor people and poverty entirely (South Africa, 2019).

Although prejudice is a big problem for the waste pickers, change is happening. In some neighborhoods, residents have been meeting the reclaimers in hopes of gaining a sense of safety knowing the people that go through their communities (Living Off Trash, 2019). Relationships are being created between the two groups to the point where homeowners will offer food and water when the pickers are going through their trash (Living Off Trash, 2019). The African Reclaimers' Association is helping to get the waste pickers registered with the city in hopes of improving relations with the police (South Africa, 2019). About 1,600 reclaimers are now registered and will be receiving IDs, gloves, and trolleys (South Africa, 2019).

## 2.8 Benefits of Upcycling

In addition to simply selling their collected recyclable materials, many waste pickers use upcycling as an alternative that yields higher profits. Upcycling is the process of taking materials or products that would normally be discarded and repurposing them in a way that increases their value (Singh et al., 2019). The products generated can then be sold for a higher profit than if they were simply recycled. Growing support for upcycled products and upcycling businesses has contributed to the continuous expansion of this industry as consumers strive to create a more resource-efficient society (Singh et al., 2019). Upcycling is viewed as a more environmentally friendly and cost-effective alternative to recycling. When materials are recycled, their value continuously decreases each time they are broken down (Singh et al., 2019). In contrast, upcycling increases the value of the final product and removes it from the value-reducing recycling process. Additionally, upcycled products eliminate the need to create new products from raw materials, conserving natural resources and reducing energy usage (Sung, 2015). By using recyclable materials, producers can reduce the costs of purchasing and transporting virgin materials. Because of this low cost of and high accessibility to starting materials, upcycling has been used as a method of alleviating poverty in developing countries (Sung, 2015). Ultimately, upcycling offers tremendous advantages in creating economic opportunities, stimulating entrepreneurship, and promoting environmental sustainability around the world.

## 2.9 Blue Sky Recycling

One organization that is working to create jobs and promote a sustainable environment in South Africa is Blue Sky Recycling. They are a company determined to remove waste from the streets by purchasing recyclables to be repurposed or resold. They buy recyclables from waste

pickers across the Greater Cape Town area while also providing employment opportunities to thousands of poverty-stricken residents of Philippi township, where their operation is located. The company currently accepts contributions of primarily glass, plastic, and paper from around 2,000 people, a mix of full-time and part-time workers (Cosmo, 2013).

Blue Sky's operations are important to the surrounding community because they motivate the pickers to make a living for themselves while also improving their community by constantly cleaning the streets that they call home. In recent years, thanks to companies like Blue Sky, South Africa has become one of the world's leaders in plastic recycling. Collecting recyclables gives pickers a sense of purpose, since they are helping work towards a cleaner and safer environment while also being paid for the materials they collect. They can work on a flexible schedule and are not required to contribute every day, which makes being a picker a more desirable job and raises community involvement (Cosmo 2013).

Blue Sky generally has excellent relationships with its pickers and is a staple of its community, but due to limited resources their operations can only expand so far. Of the 2,000 pickers logged into their database, Blue Sky is only able to collect from approximately 300 people per month due to limited trucks and employees (Recycling under the Blue Sky of Cape Town, 2019). In order to serve a greater community and have a greater environmental impact, Blue Sky wants to take a step forward and start a recycling cooperative. The cooperative will be run primarily by women, as they are often an underrepresented group in the work force and wish to become more involved in the community. The cooperative will specialize in upcycling collected materials, adding value to them before resale. Blue Sky Recycling has already chosen five individuals to become cooperative owners and this number will eventually expand to have ten owners and employ 100 women while servicing a 10 km radius of the company's headquarters in Philippi (G. Kohler, personal communication, September 12, 2019). Our team has been tasked with helping Blue Sky form this new branch of its business and we are to assess a variety of cooperative models, facilitate the start of an upcycling initiative, and assist with the formation of this self-sustaining women's recycling cooperative in order to expand their outreach to the surrounding communities.

## 3.0 Methodology

---

The goal of our project was to determine an appropriate cooperative model to start and maintain a women's recycling cooperative overseen by Blue Sky Recycling in Cape Town, South Africa. In order to achieve our goal, our team has addressed the following objectives:

1. Assess Blue Sky's current operations and business goals
2. Determine the most effective member structure to promote the long-term sustainability of the cooperative
3. Establish a feasible business model and constitution to register the cooperative as a legal entity
4. Determine profitable materials for upcycling, methods to process materials, and markets for reselling upcycled products

The following sections detail the methods the team used to achieve each of these objectives. Our methodology consists of literature reviews, semi-structured interviews, and participant observation. These methods were applied both before arrival and on-site in Cape Town.

### 3.1 Objective 1: Assess Blue Sky's current operations and business goals

In order to form a successful cooperative in partnership with Blue Sky Recycling, our team needed to develop a thorough understanding of why Blue Sky's current business is so successful and impactful on the surrounding community. Our group identified successful aspects of the existing business through research and literature review in order to apply them to the cooperative while also devising ways to improve upon their shortcomings and drawbacks. We thought it was important to keep the goals and values that Blue Sky was founded on in mind in order to create a cooperative that is as close to this vision as possible, since the cooperative is receiving funding from Blue Sky as a startup loan.

Upon our arrival in South Africa, we continued our research by touring the premises of Blue Sky and meeting with the owners to learn about the daily operations of Blue Sky (See Appendix C). We also met with Juliana Lakey and Thandiwe Munde, two of the women who are to be founding members of the cooperative. Speaking to them before formal training sessions began allowed us to understand more of their respective backgrounds, why the cooperative is so important to them and their community, and what they expected from us as facilitators for the cooperative. They both have been employees of Blue Sky for many years now, so they are involved in the recycling industry of Cape Town and were able to provide us with information on the proposed technical operations of the cooperative. This was beneficial for us as we developed a training program moving forward to relay the information to future cooperative members.

We had weekly check-ins with the founders of Blue Sky, John McKerry and Gershwin Koehler, to inform them about the progress we had made and receive their feedback to see if the cooperative was developing in a satisfactory manner. We also provided them with basic information on cooperative structures to ensure they were equally as informed as the cooperative

members. This gave them a chance to ask any questions, raise any concerns, and reassure us that the work we were doing would lead to a successful cooperative in Cape Town's recycling industry.

## 3.2 Objective 2: Determine the most effective member structure and business model to promote the long-term sustainability of the cooperative

### 3.2.1 Examining Cooperative Models

Since cooperatives have an incredibly high failure rate in South Africa, the team analyzed different cooperative models to determine what qualities are conducive to success and self-sustainability. We reviewed these models on a global scale to examine how various cooperatives adapt to the unique challenges they face due to social, political, and economic differences. This research allowed the team to make informed decisions in selecting a cooperative model best suited for Cape Town.

The team conducted a literature review on cooperative models, examining cooperatives around the world as well as cooperatives in South Africa. We examined articles focused specifically on the history and status of cooperatives in Cape Town, which provided us with detailed background information on the unique social issues and governmental policies local cooperatives face, allowing us to better approach the objective. Additionally, we interviewed Helen Barnard, a social worker at the Sizakuyenza shelter, so we could understand the social issues surrounding women's empowerment in South Africa, which was beneficial to us starting a successful women's cooperative. Barnard provided us with insight on strategies to help the founding members develop leadership skills.

Our literature review also included news articles highlighting prosperous cooperatives and online interviews of cooperative leaders to gain their personal perspectives on the strategies enabled their cooperative's success. One of these articles included an interview of Issy Engelbrecht, the founder of the Fingerprint Cooperative in Elsies River, Cape Town. A literature review was an effective strategy in achieving this objective because it allowed the team to access an extensive amount of information quickly. This method also allowed our team to research cooperatives around the world and those within Cape Town from afar, enabling us to develop a preliminary plan before arriving in Cape Town.

Our team conducted semi-structured interviews with successful cooperative leaders in Cape Town to gain insight on how to start and maintain a self-sustaining cooperative (See Appendix D). We interviewed Cape Carpenters and Woodworkers, the Brewer's Co-op, Thinana Recycling Cooperative, and the Customer Owned Cooperative. We used these interviews to gain a clearer perspective on the unique challenges these cooperatives face locally and the methods they use to maintain a successful business. Conducting these interviews on-site provided the team with information more specific to Cape Town, allowing us to identify and address problems distinctive to the area. All the data obtained from the interviews was organized, and the different cooperative structures were compared based on their differences in governance, administrative policies,

financial structures, and interpersonal dynamics. We also made a table listing all the elements for success and the frequency each one was discussed (See Appendix E). The team used this data to guide the cooperative members in selecting an effective cooperative structure, giving them examples of the different options available to them.

### 3.2.2 Facilitating Training Workshops

The team led five 2-3 hour long weekly training workshops to discuss the cooperative model with the members and to gain a clearer view of their expectations, goals, and skills. All 10 members of the cooperative were invited to the workshops as well as additional individuals that served as proxies in case certain members could not attend the meetings. We developed our training plan by reviewing effective training plans used by other cooperatives around the world. At each workshop, we began with introductions of members. Then, about halfway through the session, we would all play an interactive game, such as musical chairs, as an icebreaker. Our team facilitated the first two workshops. Our first training workshop detailed the cooperative values and principles, difference between cooperatives and corporations, benefits of the cooperative model, and rights and responsibilities of cooperative members. Our second workshop reviewed Board of Directors positions, annual general body meetings, membership fees, and the decision-making process within the cooperative.

The workshop agenda were distributed at each training session. The team then reviewed the handouts with the group, taking breaks between each section to translate the material into Afrikaans and Xhosa. We also used these breaks to initiate group discussions about the material to encourage participation and share ideas about the training.

The cooperative's founding members led the next 2 training workshops. In the third workshop, the group discussed different elements of the Constitution and voted on membership fees, profits put into the reserve, grounds for dismissal, contracts for equipment use, member loans from the cooperative, and other business decisions. We felt it was important to involve all the members in early business decisions to empower them as leaders and ensure the cooperative's self-sustainability after we leave Cape Town. As the session progressed, we provided insight on the different options available and the decisions made by other cooperatives we interviewed.

In the fourth training session, the founding members led a training session on the recycling process. Ms. Moeti, one of the founding members, discussed 10 common materials to collect, their prices, and how to process them (See Appendix F). The members also examined the volume of each material required to repay a R300,000 loan to illustrate which materials to prioritize (See Appendix G). In the fifth session, we discussed the benefits of upcycling with the members, showed members pictures of different upcycled goods we found throughout Cape Town. We facilitated a group discussion about upcycling options and the individual technical and creative skills that can be taken advantage of for product production.

The information from the workshop sessions was recorded through notetaking and compiled after the meetings. The data collected was used to track the progress of the cooperative,



examine the effectiveness of our training methods, and allow the team to make suggestions about the cooperative's structure. Additionally, as we developed more personal relationships with the members, we gained a clearer view of members' unique skills and working styles. Keeping track of these details enabled us to offer recommendations to adapt the cooperative structure to better accommodate the members.

### 3.3 Objective 3: Establish a feasible business model and constitution to register the cooperative as a legal entity

For the cooperative to begin business operations, the founding members needed to register the business with the Companies and Intellectual Properties Commission of South Africa. Our team assisted with the registration process and obtained all the necessary legal forms required for registration, namely, a form to reserve a business name, a form appointing an auditor, and an application form. The application also required a constitution agreed upon by the founding members. After our weekly training workshops, we met with the five founding members to discuss the registration process and begin filling out the required forms.

We helped the members establish a constitution outlining the cooperative's business structure. Although only the founding members had to be present during the constitution's drafting, we thought it was important to include all members in the decision-making process to ensure full transparency and collaboration. In our sessions with the founding members, the group determined multiple viable options for each part of the constitution which were then voted on by all the 10 members in the general body meetings. This ensured that all members' opinions were respected and valued during the constitution's formation. We helped the founding members draft the final constitution, using a model constitution as a template, and complete the other required forms.

### 3.4 Objective 4: Determine profitable materials for upcycling, methods to process these materials, and markets for reselling upcycled products

In addition to collecting and reselling multi-material recyclables, the members of the cooperative had an interest in establishing an upcycling branch that would create products of higher value from collected materials. To achieve this, we first examined upcycled products at private and public markets selling handmade goods around Cape Town to learn what other businesses are producing as well as what people want to buy in the local area. We visited the V&A Watershed, Oranjezicht Market, Neighbourgoods Market, Green Market Square, and the Church Street Vintage Antiques Market. We also visited individual stores at the V&A Waterfront and Old Biscuit Mill to find more examples of upcycled products. At the markets, we conducted semi-structured interviews with traders to inquire about their experiences working in the upcycling industry and to gain more insight on the upcycling market within Cape Town (See Appendix H). We noted the price points of different goods to assess each good's profit margin (See Appendix I).

The team researched private markets around Cape Town to determine their hours of operation, locations, and distances from Philippi. We also contacted the market organizers to ask



about trading permit fees since this information was not posted on their websites. The team researched the informal trading industry to learn about public markets available to traders. We emailed Patricia Richards from the City of Cape Town's Urban Management Department to inquire about the application process and the cost of obtaining an informal trading permit. We also researched online markets to determine the cost of selling goods online. The team analyzed online website builders as well as e-commerce markets. The information obtained for each market was tabulated to be used as a reference in the future if the cooperative decides to sell goods (See Appendix J & Appendix K).

The team also investigated on-site recycling systems that use more high-tech machinery, like plastic shredders and extruders, to reshape plastic material into sellable products. We were referred to Precious Plastic, an online community offering guidance on small-scale recycling, by one of the cooperative's founding members, Bronté Moeti. The team used this resource to learn more about the machinery necessary to carry out an on-site recycling operation and what kinds of goods can be produced using this process. We contacted machine builders in Cape Town using a map feature on Precious Plastic's website designed to connect individuals working in the small-scale recycling industry. The team requested quotes from these builders on the costs to build plastic shredders, extruders, injectors, compressors, and product molds (See Table 1). This enabled us to analyze the economic feasibility of investing in the process.

## 4.0 Results and Discussion

---

Our findings are organized into four sections: Blue Sky's operations and their goals for the cooperative, variations in cooperative structures, training workshops and member meetings, and South Africa's recycling and upcycling industries. The first section covers Blue Sky Recycling's goals for the cooperative, explains their motivation to start this cooperative, and outlines their contributions to the cooperative as it starts up. The second section describes our observations of various cooperatives from interviews we conducted during our time in Cape Town. We outlined the similarities that make these cooperatives successful and the differences that make them unique and functional within their respective industries. The third section goes into detail about what we discovered through conducting our workshops and creating the constitution for the cooperative with the founding members. It is split into two sections: the social aspects based on our observations in training workshops and the business aspects that were addressed during the formation of the cooperative's constitution. The final section covers the specifications of operating within the recycling industry that the cooperative members will have to follow and explores the potential for the cooperative to work in the upcycling industry in the future.

### 4.1 Blue Sky Recycling's Operations & Cooperative Goals

In an initial meeting with Blue Sky, Mr. Kohler and Mr. McKerry explained their desire to establish a women's recycling cooperative for business and social benefits. This cooperative allows Blue Sky to diversify its recycling streams because it works with 90-95% glass. They plan on investing in a baler for the cooperative that will compress materials like plastic and aluminum, allowing more materials to be stored. Recycling companies prefer pre-baled materials, so the products can be sold for higher prices. Mr. Kohler and Mr. McKerry also want to expand Blue Sky's community impact by creating more jobs through this new venture. Mr. McKerry explained the struggles of many community members, especially women, to obtain jobs and work to support their families. He feels the cooperative can address this by offering an "escape for people who have no education, no trust fund, and no job."

Blue Sky plans on supporting the cooperative with funding and mentorship through its early stages. Because many cooperatives fail due to limited support, they feel this continuous aid is crucial for the cooperative's long-term success. Mr. Kohler and Mr. McKerry are helping the cooperative source start-up equipment and infrastructure, providing it with trucks, balers, and warehouse space. If a warehouse space cannot be secured by the time the cooperative begins operations, they are providing a temporary workspace on the Blue Sky premises. They want the cooperative to negotiate a start-up loan from Blue Sky for this capital to be repaid in the future. They feel members should establish a clear budgeting and repayment plan to encourage them to take the business seriously, however they have emphasized they will support the cooperative even if members fail to follow through on repayment. Mr. Kohler and Mr. McKerry also plan on using

their relationships with recycling companies to negotiate set prices and contracts for the cooperative, securing reliable markets for their materials.

Additionally, Mr. Kohler and Mr. McKerry want to provide the cooperative with a payment system that is easy to operate. Blue Sky is dissatisfied with its current payment system, Shoprite Money Market, because it charges up to 670 USD (10,000 ZAR) per month in banking fees. Blue Sky wants to use Standard Bank Instant Money Bulk Payment instead. We learned how to use the new payment system and created a manual that allows it to be operated easily. This new system reduces banking fees and benefits pickers because they can withdraw their money from an ATM without requiring a bank account. With the money saved, Blue Sky hopes to expand its business. Establishing this new payment system not only benefits Blue Sky, but also helps the cooperative save money as well.

## 4.2 Variations in Cooperative Structures

Through interviewing local cooperatives, it became evident that there are many challenges in starting a cooperative in Cape Town. Eliot Chinsaga from the P.E.A.C.E. Foundation stated, “the problems are often vast, but I would say it’s usually a mindset issue.” Chinsaga works closely with the Thinana Recycling Cooperative, an enterprise supported by the P.E.A.C.E. Foundation. He explained that cooperatives are commonly formed to obtain start-up funding from the municipality. According to Neville Wolhuter from Cape Carpenters, this funding is approximately R350,000. Mr. Wolhuter blames this for the high failure rate of cooperatives, claiming members often just take the money then disband.

Although municipality funding can be detrimental to some cooperatives, others fail because they struggle to secure adequate funding. According to Chinsaga, “access to funding is instrumental to a cooperative’s success” in order to cover capital and operational expenditures during the start-up phase. However, many cooperatives find it challenging to take out loans from banks because they have no collateral. Additionally, many sponsoring agencies only provide initial loans and offer no long-term assistance in funding or mentorship. This allows the cooperative to begin its operations but jeopardizes its long-term self-sustainability if no training is provided.

A lack of leadership and business skills can lead to cooperative failure. Mr. Engelbrecht, founder of the Fingerprint Cooperative, explained, “people are so excited about the concept... but imagine a person who’s always worked for someone else... and all of a sudden they come into owning a business. That requires ongoing preparation.” Training is required to empower members and equip them with the necessary skills to work within the cooperative and make informed business decisions. Upskilling is also important as the cooperative grows and the industry changes, requiring new skills. For example, Mr. Engelbrecht studied at various institutions to advance his business skills as Fingerprint grew. The cooperative also provides educational opportunities to members. Additionally, members need a thorough understanding of the cooperative structure. If members do not develop a true understanding of cooperative functioning, issues arise during the cooperative’s start-up or later in its operations. Members will not understand the slow growth of

cooperatives and become impatient. Naledi Mongoato from the Customer Owner Cooperative explained, “people like the concept but our biggest challenge is that it takes time to build and people want instant success.”

A successful cooperative requires members have a thorough understanding of the industry in which it operates. Cooperatives, like all other businesses, face competition and need to develop strategic business models to survive. Members must adapt to industry changes and secure stable markets to sell goods. Mr. Engelbrecht, targeted a “sympathetic market” comprised of NGOs and community organizations that support their initiative. Building strength through networking and publicity is also very important. The Thinana Recycling Cooperative benefits from the P.E.A.C.E. Foundation’s publicity of their work. Additionally, Thinana has a working relationship with the Blouberg Local Municipality which strongly supports its work in cleaning the environment.

According to Tinus Lottering from the Brewer’s Co-op, “communication, respect, and honesty between members are the most important elements in a cooperative’s success.” Because everyone has an input on business decisions, members must feel comfortable expressing their opinions. Wolhuter stated, “having no technical problems is easy, but you will always have people problems.” Unlike corporations, cooperatives are heavily dependent on teamwork and collaboration. Thus, tension between members can be incredibly detrimental to the cooperative’s progress and must be resolved as soon as possible. Differences in work ethic and lack of trust between members are common issues that often need to be addressed.

It is important to have a fair payment system and proper incentives to minimize possible work ethic issues. For example, Thinana initially paid members the same monthly salary, but Chinsaga explained “that later gave us problems with regards to productivity, as some would work harder than others and would inevitably expect to get more.” They solved this problem by paying each member proportionally to the amount of waste they bring in. Members know they only get paid when the cooperative makes money which motivates them to work hard to benefit themselves as well as the entire cooperative. This gives them a sense of pride in the cooperative and a sense of responsibility in its success. Chinsaga explained that the Thinana members work hard because “they understand that what they put into the business in terms of time and effort is what comes out.” Additionally, cooperatives can promote member retention by increasing a member’s pay the longer they are with the cooperative. However, many cooperatives set a pay ratio to prevent the large wage gaps that are commonly seen in corporations. For example, members of the Fingerprint Cooperative are paid different wages, but Mr. Engelbrecht said, “the most senior person gets only about R800 more than the most junior worker.”

Member shares are another way to improve member retention by giving members a stronger sense of ownership of the cooperative as well as generating capital for the cooperative. The cooperative sets a value for the price of each share and shareowners are paid proportionally to the percentage of shares they hold. Customer Owned sells shares to both members and nonmembers, but these outside investors are not allowed to vote – only members can. In

comparison, the Thinana Cooperative does not sell member shares since all six of the members have equal ownership. Member shares are advantageous because they are not considered taxable income and are less risky than relying on earnings or loans as the primary sources of capital. Shares may also be returned to members if they decide to leave the cooperative.

Member shares can be disadvantageous if members hold very different percentages of the shares or have differences in work ethic. One member could own a larger percentage of shares but do less work than someone who owns a smaller percentage. This would lead to unequal pay for someone who is doing more work. For this reason, it is important that the Constitution is written in order to ensure members will be paid fairly. Many cooperatives establish a limit on the percentage of shares one member can hold. Many also limit the percentage of earnings that are paid to outside investors.

Entrance fees are another way cooperatives generate capital. Most cooperatives we researched had entrance fees of varying degrees. For example, Cape Carpenters has an entrance fee of R100 (6.84 USD). In comparison, Brewers Co-op has an entrance fee of R30,000 (2033.20 USD) which provides new members with a space on the tap and all the equipment needed to brew. High entrance fees reduce the number of applicants but ensures they are serious about joining the cooperative and willing to work hard.

Because cooperatives are democratic, it can be difficult to make decisions quickly and choose a time in which everyone can be present at meetings. Many cooperatives, especially large ones, have a Board of Directors to improve the efficiency of decision-making. The Cape Carpenters Cooperative uses a Board, but members also communicate via email to discuss issues, allowing members to solve problems without requiring meetings. Some cooperatives, like Thinana, do not use a Board of Directors. Instead, the six founding members vote on everything because they are the only official members.

The frequency of general body meetings differs between cooperatives. For example, Thinana Recycling Cooperative meets at least once a month but can meet daily to address urgent issues since they work together every day. Other cooperatives such as the Fingerprint Cooperative hold annual general body meetings to discuss various issues such as reelecting their Board of Directors, drawing up their annual budget, and addressing other membership policies. When discussing their meetings, Engelbrecht said “we’d put our ideas together, debate, and arrive at decisions amicably. And we tried to avoid getting to the voting stage.”

The interviews discussed above provided the team with valuable insight on the elements necessary to operate a successful cooperative. These elements fall into the main categories of interpersonal aspects, business structure decisions, and ways to educate members. The table in Appendix E presents each individual element discussed in interviews, its benefit, and the number of cooperatives that employed that element or mentioned its importance. It was found that incentivized payment systems, training, and strong interpersonal relationships were the most frequently discussed elements.

## 4.3 Training Workshops & Member Meetings

### 4.3.1 Social Aspects

In an initial interview at Blue Sky, Mr. Kohler mentioned that the founding members of the cooperative were incredibly nervous to begin the new business. The women had worked for Blue Sky for many years and felt hesitant about leaving their stable jobs to pursue a riskier endeavor. He also explained that South African women are commonly discouraged from taking leadership roles, which was another factor contributing to their reluctance. In an interview with Helen Barnard, a social worker at the Sizakuyenza women's shelter, it was explained to us that many women in South Africa do not believe in their leadership or work abilities because "they may never have been told that they are worth it before."

For this reason, Mr. Kohler and Mr. McKerry were strongly against their presence at the weekly workshops, feeling it would intimidate the founding members and prevent them from becoming strong leaders. They also felt members would automatically assume the cooperative was an offshoot of Blue Sky instead of its own separate enterprise. Mr. Kohler stated, "when they see us, they automatically think *BSR*, and we don't want that." Mr. Kohler and Mr. McKerry ultimately want to serve as supervisory advisors to the cooperative, offering support and advice. They felt strongly that the cooperative's members should be the ones leading training sessions and developing leadership skills to ensure the cooperative's long-term success.

We found that encouraging the founding members to facilitate the weekly workshops not only helped them develop leadership skills but also resulted in a higher level of participation by all members. Distributing fact sheets and discussing them was less engaging than when we presented our material and had the founding members lead the following discussion. This created a better opportunity for the members to start having an engaging discussion. Ms. Munde, one of the founding members of the cooperative, remarked that she enjoyed these workshops because "everyone participated in the discussion and there was a lot of respect." We found that by using this method, we were facilitating the growth of the cooperative by providing members with the necessary information then allowing them to express their opinions and make their own decisions.

As the founding members facilitated the following workshops, we found they grew more talkative and confident as they gained more leadership experience each week. Additionally, as the members bonded, they became more comfortable participating and expressing their ideas. Icebreaker activities were extremely effective in helping members bond and creating a positive atmosphere. After everyone had a chance to get out of their chairs and have fun, they felt more comfortable and were able to remain attentive during the second half of the training.

The cooperative members all come from various backgrounds and different townships, so not everybody knew each other before the workshops began. This meant that it was critical for the members to develop personal relationships. The icebreaker activities were very beneficial to keep them interested and to break up the stream of information that was being given to them. Several

cooperative members later reported that their favorite part of the workshops were the icebreaker games since they could take a break, have fun, and get to know other members.

Because cooperatives rely on collaboration and teamwork, this bonding was crucial for members to build trust and respect for one another. As Ms. Moeti, one of the founding members, said, “if one person fails, we all fail at the end of the day.” This concept can be difficult for people to grasp. Ms. Moeti continued by saying, “the mentality of working for a group is something not a lot of people are interested in.” It is natural for people to desire to work for only self-gain to provide for their families. However, this common goal can be used to motivate cooperative members to support each other as they strive for the same benefit.

Ms. Moeti explained that learning the personal stories of everybody in the group is crucial in developing empathy and support. She stated, “if Mama says ‘I’m here to support two families,’ you know that is her struggle.” Once everybody was able to learn about each other’s lives and respect their troubles, they were more likely to have compassion for other members and be inspired to work hard not only for themselves, but for the entire group. Furthermore, we found that almost every member responded that they wanted to join this cooperative because they were interested in recycling and being able to clean their communities. Keeping the group reminded of this common goal in moments of low participation or when important decisions could not be reached was helpful in keeping the group focused.

#### 4.3.2 Business Aspects

Throughout the workshops, we found that attendance was very inconsistent. Many people arrived late or would not stay for the entirety of the meeting. Although members were originally opposed to establishing a Board of Directors in fear it would threaten equality, they eventually recognized its benefits when they observed the low attendance. They realized that having a few members make business decisions would be more efficient since it would be easier to schedule meetings with fewer people. Members only need to attend general body meetings to elect members to the Board of Directors, then the Board of Directors makes decisions for the cooperative in more frequent meetings. All ten members decided that the founding members should take on the responsibilities of the Board due to their extensive experience in the recycling industry. Because Boards of Directors are often made up of people outside of the cooperative, the members decided the founding members would act as a collective of decision-makers. After establishing this collective, making decisions became a lot faster. The collective came up with options for the different constitution elements which were then voted on in the general meetings.

Another topic of discussion at the general body meetings was an entrance fee. Initially, all the members were vehemently against it. Since many of them do not have much extra money to spend, the cooperative members felt a fee would discourage people from joining because they would rather spend the money on food for their families. They came to realize that a fee could help deter people from joining the cooperative who were not serious about contributing. They also felt this would allow them to have some emergency funds if the cooperative was struggling financially.



The members eventually decided to require a small entrance fee of R100 through a unanimous vote.

Members also discussed the importance of establishing clear grounds for dismissal to penalize wrongdoings and ensure members are contributing to the cooperative's success. Because they wanted to speed up the registration process, they decided to use what was already in the model constitution, deal with problems as problems arise, and update the constitution accordingly. They also agreed that the cooperative must hold a vote on disciplinary actions in order to prevent members from kicking out people they do not like for personal reasons.

#### 4.4 Recycling Industry and Upcycling

The recycling industry in South Africa is dynamic. Mr. McKerry stated that prices can fluctuate monthly and certain materials can become unsellable without prior notice. Additionally, Ms. Moeti informed the members that the time of year can affect the influx of certain materials. She stated that she commonly experiences an increase in plastic soda bottles collected around holidays like Christmas at her recycling company, New Earth Projects. Changes within the industry can also affect the recycling process. For example, Woolworths, a local grocery store chain, is pushing toward removing labeling on plastic materials that allows them to be sorted by type. This would make the cooperative unable to sell these mixed plastics to larger recycling companies. Knowledge of changes in prices and industry trends allows members to prioritize high-priced materials and maximize profits by adapting their sorting strategies to fit market changes.

Many of the cooperative's members had no experience in the recycling industry, so recycling processing training was critical in equipping them with necessary sorting skills. Ms. Moeti discussed the different materials to look for, their prices, and the appropriate way to process each (See Appendix F & Appendix G). She emphasized that members should only collect what they have space for. Certain materials, like aluminum and clear plastic, should be prioritized due to their high price points and abundance. Materials that can be baled should also be collected because baling reduces the space required to store the material and increases its selling price.

Another strategy to maximize profits is by establishing an upcycling branch. One clear advantage is the high availability of free or low-cost starting materials. This allows the industry to have very low barriers to entry. In an interview with Lizl Naude, a local upcycler, this benefit was made clear. Naude explained that after her house was robbed, she looked to upcycling as a solution by building furniture out of discarded waste to refurnish her home. She eventually started producing smaller houseware products to sell to tourists. When discussing the benefits of using waste, she stated, "it's a free resource. It's unlimited. I rarely have an issue trying to source waste. If you just look around, there's waste everywhere and you know it's a big problem."

Many other upcycling businesses reap the benefit of low material costs, enabling high profit margins. Through visiting markets, the team observed many upcycled art pieces, houseware goods, clothing items, and accessories. These goods were produced from a wide variety of starting

materials and processing methods, illustrating the versatility of the upcycling industry (See Appendix I).

There are ways to scale-up upcycling processing that require a sizeable investment. A website called Precious Plastic offers blueprints to build machinery that upcycles plastic waste into usable products. The system consists of shredding, extrusion, injection, and compression machines. The Precious Plastic website provides a map feature that allowed us to locate and contact machine builders in Cape Town for equipment quotes. We received responses from three builders and generated a range of prices for each piece of equipment. These prices as well as each machine's function is illustrated in Table 1.

**Table 1:** This table shows the range of prices for plastic recycling equipment provided by 3 machine builders contacted on the Precious Plastic website.

Equipment	Use	Cost Range
Shredding Machine	Breaks plastic down into usable pieces	R23,000 – R35,000
Extrusion Machine	Melts plastic into uniform threads	R25,000 – R45,000
Manual Injection Machine	Makes smaller plastic objects with molds	R15,000 – R19,000
Compression Machine	Makes larger plastic objects with molds	R35,000
Molds	Used to shape plastic into final products	R3,200 – R7,500

An injection machine is the least expensive of the three options but requires molds, which range in price based on complexity. The system may be profitable using simple molds that are easy to produce, like tiles, beams, and bricks. An extrusion machine does not require molds and can be used to make products by winding the plastic thread into form as it emerges from the machine, making it capable of producing 3D printing filament. This filament can be sold for approximately R200 – R300 per kilogram while unprocessed plastic waste can be sold for only R0.50 – R2.50 per kilogram depending on the type (See Appendix G for detailed pricing). Because of this significant increase in product value, producing 3D filament yields a very high profit margin.

There are many types of markets in Cape Town in which local traders sell upcycled goods — private markets, public markets, and online markets. Private markets charge fees based on the days of selling and the type of good sold (See Appendix J). The Earth Fair Food and Shopping Market, ten miles away from Philippi, is the most accessible market. Bay Harbour Market has the lowest cost range per day (R250 – R410), but Mojo Market is open for the most hours per day, making it the most cost effective at a per hour rate. The information obtained for each private market can be seen in Appendix J.

There are many public markets, like Green Market Square, where informal traders can sell goods with a trading permit from the municipality, ranging from R70 – R500 per month. Goods at informal markets have low price points and bartering is a common practice. The goods available are mostly souvenir items appealing to tourists. In comparison, the goods at private markets

generally have higher prices and are marketed to both tourists and locals. Many traders use online markets like Etsy and Hello Pretty that charge processing fees, commission, and listing fees per item. Many traders have their own websites to sell goods. Online website builders charge a monthly fee and investment in advertising is often required to attract customers. E-commerce websites are usually used for smaller operations while personal websites are common for large-scale production. The costs of each online market are detailed in Appendix K.

## 4.5 Recommendations

Based on the information that our team gathered, we developed numerous recommendations for both the current and future operations of the cooperative. We believe that these recommendations can promote the cooperative's development and future success.

### 4.5.1 Cooperative Structure

**Each member should be required to pay a subscription fee in addition to the entrance fee.**

One of the first decisions the cooperative made was to establish an entrance fee for new members of the cooperative. This helped provide the cooperative with a small amount of emergency funds and ensure that only new members were ones that are serious about working in the cooperative. However, only having an entrance fee forces the cooperative to solely rely on the work each member does. The only income the cooperative will receive is from the recyclables they receive. Establishing a subscription fee in order to be able to stay in the cooperative would help generate more funding for the cooperative. If members are not able to reach their goals or business is not going well for a period, the cooperative can rely on these excess funds from the subscription fees.

**The cooperative should offer loans for qualified members if they need financial support.**

Loans can be beneficial to both the cooperative and its members. They can be given to qualified members for the purpose of cooperative related business ventures. The money could potentially be used for replacing equipment, repairing scales, or expanding buyback centers. Loans can be applied for after six months of being a member. The Board of Directors will decide on the criteria for receiving a loan and vote on who will receive it. Loans must be paid back within six months with thirty percent interest.

**The cooperative should allow members to buy shares in the business once it is successful.**

Shares bring more money into the cooperative that can be used for investment and business expansion. They are a low-cost way of building capital because the cooperative is not required to pay interest on this money like it would for a loan. In contrast, only charging annual fees does not give members the same sense of ownership, and these fees are considered taxable income and not returned to members if they choose to leave. The cooperative should implement shares once they are a fully functional and sustainable business. As the cooperative is beginning, we do not recommend it sells member shares because there would be little money to pay out members if they

chose to leave the cooperative. Once the cooperative is well established and has a sound financial base, they can begin selling shares to build some extra capital.

#### 4.5.2 Sustainability of the Cooperative

##### **A partnership between Sizakuyenza and the cooperative would be mutually beneficial.**

We recommend that the cooperative works with the Sizakuyenza shelter on the same premises as Blue Sky Recycling. The shelter supports women and children who were victims of domestic violence in their previous living situations. They provide them with group counseling, therapy, and job training for skills development. This includes various types of training with local companies, including Blue Sky. When women reach the end of their three-month stay at Sizakuyenza, these companies often offer them jobs and the women are rehoused in or around Philippi. This prevents the women from going back to their old lives and allows them to provide for their families. A partnership between the Sizakuyenza shelter and the cooperative would benefit both parties. The women of the shelter would be able to receive basic recycling training, such as sorting, that could give them employable skills and prevent them from returning to abusive households. In return, the cooperative could gain new members who would be hardworking and determined to change their lives for the better.

##### **All general meetings of the cooperative should be interactive and inclusive.**

General body meetings of cooperatives often only happen once a year, making it critical that as many members as possible are present and any important decisions are made at this time. To ensure every issue is addressed, each member should be able to submit agenda items for consideration and voice their opinion on each issue presented. Members' voices are equally important, so prompting the quieter members by going through the group and giving everyone a chance to speak will be crucial. Additionally, the members must be held to a standard of professionalism when debating each issue. Mutual trust and respect will be lost if some members interrupt others too often. The only case in which a member should be cut off is if the debate has gone on too long and a vote must be taken to keep the meeting at a reasonable time.

##### **The training plan should include systematic empowerment for new members.**

Since most of the target group for cooperative members come from disadvantaged backgrounds and have never worked in a business like this before, they will be nervous and unsure upon joining the cooperative. We noticed this several times throughout the workshops, as several of the women indicated that they were scared to begin work and did not possess what they felt were adequate leadership skills. As seen in the findings regarding empowering the female members of our cooperative, it is not uncommon for these women to have never heard basic positive affirmations. Therefore, our team feels that it would be helpful for each new member of the cooperative to be able to express their concerns to a veteran member who has already worked through their nerves and will be able to provide encouragement. We suggest a mentorship program that allows each new member to be matched up with a veteran member who can guide them

through their worries and provide them with some of their introductory training as they first join. Cooperatives work best if they have a well-defined sense of community. Empowering interpersonal interactions are important in creating this culture and will combat low participation and high member turnover rates.

**The cooperative should apply for funding from fitting economic programs to combat financial struggles during repayment of startup loans.**

The cooperative wishes to pay back its loan from Blue Sky as fast as possible in order to become fully self-sufficient, which will unfortunately make the cooperative financially unstable, especially at first. In order to prevent the cooperative from running out of financing early into its operations, it will be beneficial for the cooperative to pursue other funding sources to ensure financial stability. For example, Black Economic Empowerment is a racially selective program created by the government in order to counteract the inequalities of apartheid and give economic advantages to black-owned businesses. The cooperative should also consider applying to the Isivande Fund, which aims to accelerate women's economic empowerment by providing financing options to businesses that are at least fifty-one percent owned by women. Furthermore, the fund's primary purpose is to promote self-sustainable businesses that are started by black women, and the cooperative perfectly fits this criterion.

**The cooperative should create a contract for equipment use.**

A primary concern for members at our workshops was that people would break the rules and not be held accountable, bringing the cooperative as a whole down. Creating contracts regarding the use of any company-loaned equipment is one way to ensure that people joining the cooperative are ready to be serious, rule-abiding members. Furthermore, it gives the cooperative the ability to enforce their rules and reprimand anyone who breaks them. The "starter kit" that each member will receive contains at minimum a scale, gloves, bags, and safety goggles. This is a very expensive kit and the cooperative cannot afford to take any losses on this equipment. A contract is the best way to ensure that each member will pay off their loan and use the equipment only for cooperative work instead of wearing it down with non-work-related use.

**The cooperative should provide training handbooks to new members with pamphlets advertising prices for pickers and members.**

The training documents from weekly workshops and final constitution should be compiled into a handbook and printed for new members. A pamphlet with the recycling process guidelines should also be provided. These documents should be translated into Xhosa and Afrikaans to ensure all members have a full understanding of the material. Many new cooperative members will have had no experience in the recycling industry when they join. Giving each member basic information on the cooperative and how it functions as well as a fully comprehensive guide to processing different recyclables will be a good start to training. The recycling guide should be brief and easy to read. It should include the types of materials that are accepted at the cooperative's buyback

centers, their prices per kilogram, and basic instructions on how to process them before bringing them in. This way, the pickers will easily be able to understand what they should be collecting. Finally, the handout can advertise one of the primary incentives of being in the cooperative, which is that cooperative members get better prices for their collected goods.

#### 4.5.3 Upcycling and Future Pursuits

**The cooperative should network with other local cooperatives and upcycling companies.**

Through our interviews, we found many individuals who were supportive of the cooperative and proposed opportunities that can benefit the cooperative in the future. Lizl Naude from Lilly Loompa, for example, said that she wants to purchase waste from local women and teach them how to produce her products, mentioning that working with a cooperative could aid in this endeavor. Members should stay in contact with her in case she wants to scale-up her business in the future. Additionally, Neville Wolhuter from Cape Carpenters offered to buy all the Styrofoam the cooperative collects. This could open a new profitable waste stream that the members were not planning on taking advantage of.

**The cooperative may benefit from waiting until it is earning steady profits before investing in expensive upcycling machinery like the Precious Plastic system.**

Inexpensive options should be explored first, like producing art, to enable the members to explore the upcycling industry without making a potentially risky investment. Members should discuss their individual skills to determine what production methods are most feasible. If members have an interest in pursuing an on-site recycling operation, they should try to collaborate with individuals using the Precious Plastic system in the area via the website's map feature. Establishing a partnership may allow them to produce prototypes and work with the machinery before investing themselves. Additionally, there are many online tutorials that offer ideas on how to recycle plastic at-home. For example, an old blender or food processor can be used instead of a plastic shredder. Plastic pieces can be melted in toaster ovens in a well-ventilated area outdoors and reshaped in homemade molds. There are many small-scale alternative strategies that should be investigated before investing in a large-scale operation.

## 5.0 Conclusion

---

High unemployment, gender inequality, and poor waste management are all prevalent issues among the impoverished informal settlements of Cape Town. Residents from such communities hope to increase their incomes in order to provide better lives for themselves and their families. Use of the cooperative model is potentially an effective method to help these communities come together and work to accomplish their mutual goals.

Cooperatives promote equality among members, giving them a significant advantage over corporations in terms of sharing benefits from the business, and in terms of overall community development. Furthermore, cooperatives are versatile and can be structured in many ways to address a variety of social issues and to provide opportunities to groups that are generally disadvantaged, such as women. The coop model is also applicable to a variety of industries.

During our cooperative meetings, we observed the women becoming comfortable and finding their voices within a society that has not empowered women to speak thanks to the benefits of the cooperative structure. Furthermore, the women have already indicated that the cooperative is improving their lives by providing them with a source of income and with skills that they can pass on to change the lives of others. Our team hopes that this project will encourage more communities to start cooperatives in the future. We believe that our recommendations regarding cooperative business structure and member dynamics will remove some of the barriers associated with adopting the cooperative model and help build a better Cape Town community.



## Bibliography

---

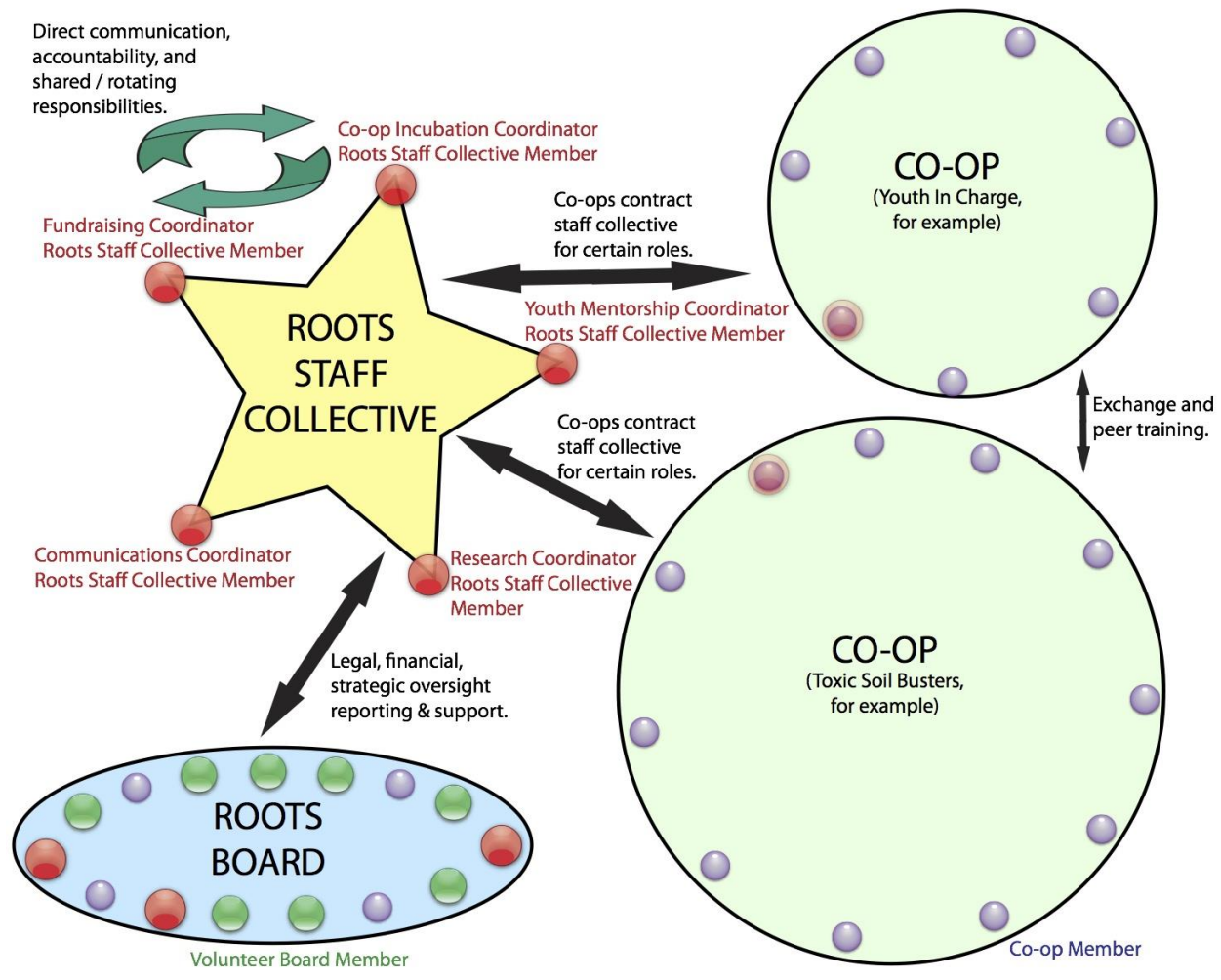
- Adams, J. (2001). Composting cooperatives serve Boston area business. *Biocycle*, 42(6), 29. Retrieved from <http://ezproxy.wpi.edu/login?url=https://search-proquest-com.ezproxy.wpi.edu/docview/236888246?accountid=29120>
- Blue Sky Recycling. (n.d.). Retrieved from <https://www.nichemarket.co.za/construction/blue-sky-recycling>
- Central Intelligence Agency. (2017). The World Factbook: Country Comparison: Distribution of Family Income – Gini Index. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html>
- COOP Africa. (2007). Empower Rural Women - End Poverty and Hunger: The Potential of African Cooperatives [Brochure]. The Cooperative Facility for Africa. Retrieved from [https://www.ilo.org/wcmsp5/groups/public/---africa/documents/publication/wcms\\_174990.pdf](https://www.ilo.org/wcmsp5/groups/public/---africa/documents/publication/wcms_174990.pdf)
- Cosmo, S., McKeogh, B., Parmanand, A., & Stergiou, K. (2013). Blue Sky Recycling Programme. Retrieved from <https://wp.wpi.edu/capetown/projects/p2013/blue-sky-recycling-programme/preparation/>
- Fair Plastic Alliance. (2019, June 5). Happening in Cape Town township: a recycling hub for women and youths. Retrieved from <http://www.fairplasticalliance.org/happening-in-cape-town-township-a-recycling-hub-for-women-and-youths/>
- Fair Plastic Alliance. (2019, June 5). Recycling under the Blue Sky of Cape Town. Retrieved from <http://www.fairplasticalliance.org/recycling-under-the-blue-sky-of-cape-town/>
- Fair Plastic Alliance. (n.d.). Happening in Cape Town township: a recycling hub for women and youths. Retrieved from <http://www.fairplasticalliance.org/happening-in-cape-town-township-a-recycling-hub-for-women-and-youths/>
- Fair Plastic Alliance. (2019, June 9). Recycling under the Blue Sky of Cape Town. Retrieved from <http://www.fairplasticalliance.org/recycling-under-the-blue-sky-of-cape-town/>
- Institute for African Alternatives. (2018, January 16). Co-operatives in South Africa and Beyond. Retrieved from <https://ifaaza.org/2018/01/16/co-operatives-in-south-africa-and-beyond/>
- Kanyane, M. H. & Ilorah, R. (2015). The Cooperative Landscape in South Africa: Analyzing Critical Issues. *Africa Today* 61(3), 2-14. Indiana University Press. Retrieved September 2, 2019, from Project MUSE database.
- Living Off Trash: waste pickers reclaim the streets. (2019, June 2). Sunday Independent [South Africa], p. 16. Retrieved from

- [https://link.gale.com/apps/doc/A587401544/GIC?u=mlyn\\_c\\_worpoly&sid=GIC&xid=115a5e5c](https://link.gale.com/apps/doc/A587401544/GIC?u=mlyn_c_worpoly&sid=GIC&xid=115a5e5c)
- Molyneaux, A. (2018, May 31). How Empties Changed Ma Agnes and her Son's Life. Retrieved from <https://www.sasdialliance.org.za/how-empties-changed-ma-agnes-and-her-sons-life/>
- Nyoka, A., DuPlooy, E. & Henkeman, S. (2014, June). Reconciliation for South Africa's education system. Retrieved from <https://elmmagazine.eu/issue-2-2014/reconciliation-for-south-africa-s-education-system/>
- Rena, R. (2017). Cooperatives in South Africa: A Review. *Indian Journal of Science and Technology*, 10(45), 1–12. doi: 10.17485/ijst/2017/v10i45/117678
- SDI South Africa Alliance. (2013, March 17). Turning Waste into Profit: Ghana Visits Cape Town's Recycling Programme. Retrieved from <https://www.sasdialliance.org.za/ghana-visits-cape-towns-recycling-programme/>
- Sehume, J. (2018, June 24). Solving poverty, unemployment and inequality. Retrieved from <https://www.iol.co.za/sundayindependent/dispatch/solving-poverty-unemployment-and-inequality-15658217>
- Singh, J., Sung, K., Cooper, T., et al. (2019). Challenges and opportunities for scaling up upcycling businesses—The case of textile and wood upcycling businesses in the UK. *Resources, Conservation and Recycling*, 150. doi: 10.1016/j.resconrec.2019.104439
- South Africa: Jhb Waste Pickers Face Routine Harassment. (2019, March 12). allAfrica.com. Retrieved from [https://link.gale.com/apps/doc/A578115300/GIC?u=mlyn\\_c\\_worpoly&sid=GIC&xid=46870f01](https://link.gale.com/apps/doc/A578115300/GIC?u=mlyn_c_worpoly&sid=GIC&xid=46870f01)
- South Africa: Tensions Between Waste Pickers and Johannesburg Municipality Escalate. (2019, June 3). AllAfrica.com. Retrieved from [https://link.gale.com/apps/doc/A587582294/GIC?u=mlyn\\_c\\_worpoly&sid=GIC&xid=9e7e686e](https://link.gale.com/apps/doc/A587582294/GIC?u=mlyn_c_worpoly&sid=GIC&xid=9e7e686e)
- Southall, R. (2019, May 18). Littering in South Africa is the expression of wider selfish – and costly -- culture. Retrieved from <http://theconversation.com/littering-in-south-africa-is-the-expression-of-wider-selfish-and-costly-culture-96186>
- Strydom, W., & Godfrey, L. (2015, September). Co-operative good practice guide in the waste sector: A guideline for co-operatives by co-operatives. Retrieved from <https://www.sagreenfund.org.za/wordpress/wp-content/uploads/2016/05/CSIR-Co-operative-good-practice-guide.pdf>
- Sung, K. (2015). A review on Upcycling: Current Body of Literature, Knowledge Gaps and a Way Forward. Retrieved from [https://www.academia.edu/12022127/A\\_Review\\_on\\_Upcycling\\_Current\\_Body\\_of\\_Literature\\_Knowledge\\_Gaps\\_and\\_a\\_Way\\_Forward](https://www.academia.edu/12022127/A_Review_on_Upcycling_Current_Body_of_Literature_Knowledge_Gaps_and_a_Way_Forward)

- Tetrapak. (2018, August 20). Green Roof - recycling project in Thailand. Retrieved from <https://www.tetrapak.com/sustainability/cases-and-articles/the-green-roof-project>
- Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. 30(4), 797–808. doi: 10.1016/j.habitatint.2005.09.005
- Wonci, T. (2019, April 29). South Africa has a long history of gender discrimination. Retrieved from <https://www.iol.co.za/business-report/opinion/south-africa-has-a-long-history-of-gender-discrimination-22170778>
- Worcester Roots. (2019). *Board Roles*. Retrieved from <https://www.worcesterroots.org/about-2/staff-and-board/board-roles/>
- Worcester Roots. (2019). *Collaborations*. Retrieved from <https://www.worcesterroots.org/about-2/collaborations/>
- Worcester Roots. (2019). *Co-op academy curriculum additions*. Retrieved from <https://www.worcesterroots.org/curriculum-additions/>
- Worcester Roots. (2019). *Why a staff collective?*. Retrieved from <https://www.worcesterroots.org/about-2/staff-and-board/why-a-staff-collective/>
- The World Bank. (2018, April 3). Access to Education, Skilled Jobs Creation Can Accelerate Poverty and Inequality Reduction in South Africa. Retrieved from <https://www.worldbank.org/en/news/feature/2018/04/03/access-to-education-skilled-jobs-creation-can-accelerate-poverty-reduction-and-inequality-in-south-africa>

# Appendices

## Appendix A: Administrative Structure of Worcester Roots



## Appendix B: Sector Analysis of Cooperatives in South Africa

**Table 1.** Sector analysis of cooperatives in South Africa

Type of Co-ops	CIPC 2009 Data	the dti Baseline Study	Survival Rate(%)	No. of Dead Co-operatives	Mortality Rate (%)
Food and Agriculture	6 086	671	11%	5 415	89%
Services	4 209	357	8,5%	3 852	91,5%
Textiles	1 247	272	22%	975	78%
Multipurpose	3 160	187	6%	2 973	94%
Construction	1 280	202	16%	1 078	84%
Manufacturing	1 093	137	12,5%	956	87,5%
Arts and crafts	340	103	30%	237	70%
Social	311	90	29%	221	71%
Other	328	89	27%	239	73%
Home Industry (Baking)	334	83	25%	251	75%
Transport	856	50	6%	806	94%
Trading	2 708	47	1,8%	2 661	98,2%
Financial/Credit Services	233	36	15%	197	85%
Housing	78	25	32%	53	68%
Burial	65	19	29%	46	71%
Mining	78	12	15%	66	85%
Consumer	128	11	9%	117	91%
Recycling and Waste Management	85	7	8%	78	92%

Source: CIPC Register: 1922 – 2009 and Baseline Study, DTI.

### Appendix C: BSR Interview Questions

**The following interview questions were asked in a semi-structured interview with Gershwin Kohler and John McKerry from Blue Sky Recycling:**

We are requesting your permission to interview you about your knowledge regarding your recycling operations and goals for the cooperative. We will be recording your responses. This interview will take approximately 30-45 minutes. No audio recording will occur without your prior knowledge and consent. If you have any questions prior, during, or after the interview has finished, please feel free to ask. Your participation is greatly appreciated. Please feel free to contact us with any questions or concerns at [gr-CT19-Coop@wpi.edu](mailto:gr-CT19-Coop@wpi.edu). You may also contact our WPI project advisor, Melissa Belz, at [mbelz@wpi.edu](mailto:mbelz@wpi.edu).

1. Can you tell us about the women that we are going to be working with?
2. How much of a business plan has been made by BSR?
3. What resources will be provided by Blue Sky? (Equipment, personnel, funding, etc.)
4. How many recyclables will be provided by Blue Sky and what is its composition?
5. What are some limitations of the setting that we should be aware of?
6. What's the funding/financial situation like in Cape Town?
  - a. What kind of loan is BSR interested in obtaining?
  - b. Do you already have plans in place for this?
  - c. Have you chosen a bank yet?
7. Will Blue Sky be providing on-going mentorship and training or will its assistance only be at the start of the cooperative's formation?

## Appendix D: Cape Town Cooperatives Interview Questions

**The following questions were asked in an interview with successful local cooperatives in Cape Town:**

We are a group of university students from the United States of America working with Blue Sky Recycling in order to determine an appropriate cooperative model for a women's recycling and upcycling cooperative. We are requesting your permission to interview you about your knowledge regarding successful cooperatives and record your responses. This interview will take approximately 30-45 minutes. The purpose of this interview is to get a clearer understanding of what it takes to form a successful, self-sustaining cooperative that maintains a good reputation in the surrounding community. No audio recording will occur without your prior knowledge and consent. If you have any questions prior, during, or after the interview has finished, please feel free to ask. This project is a collaborative effort between Blue Sky Recycling and WPI, and your participation is greatly appreciated. Please feel free to contact us with any questions or concerns at [gr-CT19-Coop@wpi.edu](mailto:gr-CT19-Coop@wpi.edu). You may also contact our WPI project advisor, Melissa Belz, at [mbelz@wpi.edu](mailto:mbelz@wpi.edu).

1. Can you tell us a bit about your cooperative and how it was started? How many members do you have?
2. What are some challenges of starting and operating a cooperative in Cape Town?
3. What strategies have you used to make your cooperative successful?
4. How do you recruit members? Do you look for members with the right skills or do you provide training?
5. How often do you have general meetings? Do you have a board of directors that make business decisions or does every member get a vote?
6. How do you compensate your members? Is everyone paid the same or is there a set pay ratio?
7. Do you have issues with low work ethic of some members? How do you incentivize members to work hard? Have you ever had to remove a member?
8. Do you sell member shares? Is payment based on the number of shares a member holds? Do you offer shares to outside investors?



### Appendix E: Elements for Successful Cooperatives

<b>Elements for Successful Cooperatives</b>		
<b>Element</b>	<b>Benefit</b>	<b>Frequency</b>
<b>Incentivized Payment System</b>	Ensures members are paid fairly and promotes member retention	5
<b>Training</b>	Teaches members about the cooperative structure and helps them develop business and leadership skills	5
<b>Strong Interpersonal Relationships</b>	Promotes collaboration and teamwork	4
<b>Funding</b>	Helps pay for start-up capital and operational costs	3
<b>Member Shares</b>	Bring in capital and provide members with sense of ownership	3
<b>Board of Directors</b>	Helps improve efficiency of decision-making	3
<b>Support from Parent Organizations &amp; Community</b>	Provides long-term funding, mentorship, markets, and assistance	2
<b>Knowing the Industry</b>	Helps members improve efficiency and increase profits	2
<b>Sense of Ownership</b>	Motivates members to work harder	2
<b>Entrance &amp; Subscription Fees</b>	Bring in capital and ensure applicants are serious about working hard	2
<b>Transparency</b>	Builds trust between members and gives them faith in cooperative	1
<b>Use First Languages of Members</b>	Helps members better understand materials discussed in training sessions and meetings	1

This table shows the elements for success discussed in interviews with five local cooperatives in Cape Town. The frequency column notes the number of interviewees that mentioned employing the corresponding element in their cooperative. Note that interviewees were not asked directly about each element. The frequency is based on if the element was brought up organically in each interview.

### Appendix F: Recycling Handout

#### Types of Recyclables



**PET (Plastic bottles)**  
Clear, green, brown



**K4 (Cardboard)**  
Shiny & non-shiny types



**Tetrapak**  
Milk/juice cartons



**HD2**  
Hair product containers, detergent bottles



**PP5**  
Plastic food containers



**Aluminum**  
Lightweight cans



**Steel**  
Heavier than aluminum



**Glass**  
Beer & cider bottles



**Newspaper**



**Aldi Mix**  
Newspaper bags, bread bags  
Separate clear & colored



**Aldi Clear**  
Book covers  
Thicker than Aldi Mix



**White Paper**



**Colored Paper**



**Cling Wrap**

#### Symbols to Look For



**PET**



**HD2**



**PP  
PP5**

Always check the bottom of a plastic container to see which type it is.

#### Remember:

- PET, HD2, PP5, glass, and aluminum are recommended.
- Take the lids off of PET bottles - these are HD5.
- Throw away the straw & plastic lid from soda cups.
- Egg cartons are not recyclable.
- With old food containers, be careful of the smell! Always wear your mask.
- Do not open containers that once held dairy or meat.
- Safely crush or break down the materials so you have more space.
- If cardboard or paper gets soggy, throw it away.

### Appendix G: Material Prioritization

Material	Price per kg	Weight needed (kg)	Weight per month
<b>Clear PET*</b>	R2.50	120,000	<b>10,000</b>
<b>Green PET*</b>	R1.00	300,000	<b>25,000</b>
<b>Brown PET*</b>	R0.50	600,000	<b>50,000</b>
BM (HD2)*	R1.50	200,000	16,667
<b>PP5</b>	R2.50	120,000	<b>10,000</b>
White Paper*	R0.80	375,000	31,250
K4*	R0.25	1,200,000	100,000
<b>Aluminum*</b>	R8.00	37,500	<b>3,125</b>
Scrap Metal	R0.80	375,000	31,250
Steel Tin	R0.80	375,000	31,250
LD Mix (Soft Plastic)	R1.40	214,286	17,858
LD Clear	R2.00	150,000	12,500
Shrink Wrap	R0.70	428,572	35,715
Glass	R0.35	857,143	71,429
Newspaper*			

This table shows a cost analysis of the weight of each material necessary to repay a R300,000 loan within 1 year. Materials with asterisks are materials that can be bailed. Materials in bold are volumes that can feasibly be obtained in the given time period.

## Appendix H: Upcycling Companies Interview Questions

**The following interview questions were asked to the founders of upcycling companies in Cape Town at markets and via email:**

We are a group of university students from the United States of America working with Blue Sky Recycling to facilitate the development of a women's recycling and upcycling cooperative. We are requesting your permission to interview you about your knowledge regarding the upcycling industry and record your responses. This interview will take approximately 30-45 minutes. No audio recording will occur without your prior knowledge and consent. If you have any questions prior, during, or after the interview has finished, please feel free to ask. This project is a collaborative effort between Blue Sky Recycling and WPI, and your participation is greatly appreciated. Please feel free to contact us with any questions or concerns at [gr-CT19-Coop@wpi.edu](mailto:gr-CT19-Coop@wpi.edu). You may also contact our WPI project advisor, Melissa Belz, at [mbelz@wpi.edu](mailto:mbelz@wpi.edu).

1. What inspired you to get involved in the upcycling industry?
2. Do you feel that Cape Town supports sustainability and eco-friendly products?
3. What products do you produce and where do you source your materials?
4. What is your production process?
5. How many people do you employ?
6. What are some benefits and challenges of working in upcycling?
7. What impact does your business have on the community?
8. Where do you sell? Do you sell online?

### Appendix I: Upcycled Goods

<b>Company</b>	<b>Goods Sold</b>	<b>Upcycled Materials Used</b>	<b>Where Goods Are Sold</b>	<b>Cost of Goods</b>
<b>Lucy &amp; Muffet</b>	Duffel bags, backpacks, laptop cases	“salvaged army canvas, dead stock leathers, 100% wool tweeds and other reclaimed materials”	Oranjezicht Market, Hello Pretty	R600 - R2,500
<b>Bonsela</b>	Ground and hanging planters	Old billboards donated from advertisers in Cape Town	Oranjezicht Market, Watershed, online shop	R120 - R580
<b>Sexy Socks</b>	Men’s socks and underwear	Disposed fabric off-cuts	Oranjezicht Market, various Cape Town retailers, online shop	R199
<b>Lilly Loompa</b>	Houseware	Recycled bottles and wood	Online shop, various Cape Town retailers	R95 – R420
<b>Jerald Blaber Knife Maker</b>	Knives	Recycled steel from old saws and wood from wine barrels	Neighbourgoods Market, Olive Branch Deli	R350 – R2000
<b>Township Guitars</b>	Guitars	Oil cans	Watershed, online shop	R4,500 – R6,950
<b>Recycled Flip Flop Sculptures</b>	Animal sculptures	Flip flops	Watershed, online shop	R220 - R750
<b>Curb Art</b>	Wall art	Beach plastic	Watershed	R500 – R2,500

## Appendix J: Private Markets

<b>Market</b>	<b>Address</b>	<b>Distance from Philippi</b>	<b>Hours of Operation</b>	<b>Fees &amp; Commission</b>
<b>Lourensford Market</b>	Lourensford Rd, Somerset West, CT 7130	24 miles	Fridays: 17:00- 21:00 Sundays: 10:00-15:00	R250-R500 per day depending on size and location
<b>Mojo Market</b>	30 Regent Rd, Sea Point, CT 8060	17 miles	Everyday 8:00 – 23:00	7 days/week = R2,500 Mon.-Fri. = R360 per day Sat. & Sun. = R1,200 Sat. OR Sun. = R600 per day Fri., Sat., & Sun. = R1,500 Public Holiday = R600 per day
<b>Earth Fair Food and Shopping Market</b>	Block B, South Palms Centre, 333 Main Rd, Tokai, CT 7965	10 miles	Wed. = 16:00- 21:00 Fri. = 16:00- 22:00 Sat. = 8:30- 14:00	R250-R550 per day depending on goods sold
<b>Bay Harbour Market</b>	31 Harbour Rd, Hout Bay, CT 7872	18 miles	Friday = 17:00- 21:00 Sat./Sun. = 9:30- 16:00	Friday = R250 Sat/Sun = R410 per day
<b>Oranjezicht Market</b>	Granger Bay Blvd, V&A Waterfront, CT 8051	17 miles	Saturday = 8:15- 14:00 Sunday = 9:00- 15:00 Wed. = 16:00- 20:00	R600-R800 per market
<b>Neighbourgoods Market</b>	373 Albert Rd, Woodstock, CT 7925	12 miles	Saturday 9:00- 15:00	Quote upon application
<b>The Watershed V&amp;A</b>	V&A Waterfront, 17 Dock Rd, CT 8002	16 miles	Everyday 10:00- 19:00	Quote upon application

### Appendix K: Online Markets

<b>Market</b>	<b>Type of Goods Sold</b>	<b>Website</b>	<b>Fees</b>
<b>Etsy</b>	Handmade jewelry, shoes, clothes, houseware, toys, art, gifts, etc.	<a href="http://www.etsy.com">www.etsy.com</a>	R2.92 (0.20 USD) listing fee, 5% transaction fee 3% + R3.66 (0.25 USD) payment processing fee
<b>Hello Pretty</b>	Jewelry, clothing, home, accessories, art, food, etc.	<a href="http://www.hellopretty.co.za">www.hellopretty.co.za</a>	5% payment processor fees 15% commission, R10 payout fee (only when you make sales) (1x per week)
<b>Squarespace</b>	Personal website - any goods can be sold	<a href="http://www.squarespace.com">www.squarespace.com</a>	Basic commerce account = R380.22 (26 USD) Advanced commerce account = R584.96 (40 USD) per month (+ cost of advertising)