



**WPI**



# Developing a Green Business Opportunity for Self-Sustainability in Windhoek's Informal Settlements

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## CHAPTER 1: INTRODUCTION

Namibia is a developing nation in southern Africa that has struggled with a high rate of unemployment. According to the 2014 Namibian Labour Force Survey, 27% of Namibians are unemployed (Namibia Labour Force Survey, 2014). Men and women move from rural areas in northern Namibia to urban areas looking for jobs, but often they do not find employment and cannot afford to live in the city. These issues have caused an increase in the size and number of informal settlements on the outskirts of major cities (Pendleton, 1996). Katutura is one of these informal settlements on the outskirts of Windhoek, the capital of Namibia. The absence of regulations and wealth in these informal settlements have led to a lack of a formal economy, structured education, and professional training (Kaes, 2013). In 2014, 59.8% of the Namibian population worked in the informal sector in activities such as running a hair salon, bar, or food stall (Namibian Labour Force Survey, 2014, Shindondola-Mote & Ohlsonn, 2013). A lack of formal jobs makes self-employment and entrepreneurship a vital part of informal economies. Many individuals with informal employment desire to improve and formalize their businesses, while those with no jobs seek opportunities to generate income.

MSR, formerly known as Men on the Side of the Road, is a non-profit organization that aims to reduce unemployment in the informal settlements of Windhoek. This organization provides training programs, links its participants with short and long term employment opportunities, and encourages its members to start their own businesses (“Men on the Side”, 2016). Additionally, MSR seeks to address the issue of waste management and recycling in Windhoek (Beukes, personal communication, February 2, 2017). In 2008, the city of Windhoek produced 230 kg of general waste per capita (Hasheela, 2009). Wood pallets, oil drums, tires, and plastic bags are commonly lying on or near the streets of Katutura. Since there is not a formal government-run recycling program in Namibia (Windhoek Waste Management Regulations, 2011), MSR hopes to take advantage of the available materials to manufacture products.

Multiple organizations have attempted to establish entrepreneurship programs in Katutura to encourage self-sustainability. A previous MSR project attempted to sell blocks of compressed paper in Katutura as an alternative to firewood. MSR discontinued the project due to marketing

and distribution issues, product faults, and lack of profit. In 2014, a team of researchers from Worcester Polytechnic Institute proposed an improved block design, a more appealing price structure, and a better distribution scheme (Hunt et al., 2014). Their suggested business model focused on selling the blocks to existing third-party retailers, who would sell them for a profit. However, MSR again abandoned the project because of product faults, and a lack of consumer appeal.

In 2016, MSR began teaching an entrepreneurship training program to help members develop their entrepreneurial skills. This training focuses on starting small businesses, marketing tactics, and financial planning. In January 2017 Team Namibia began promoting the production and sale of quality goods within Namibia. This non-profit organization is training and supporting 25 existing entrepreneurs in Katutura to develop their businesses using funding from the Embassy of Finland (Namibia Economist, 2016).

Previous efforts to introduce entrepreneurship in Windhoek and Katutura have not succeeded due to a lack of necessary understanding of the market, while successful employment efforts have not created enough jobs. Past research did not include proper collaborations to create products that appeal to target customers. Furthermore, previous projects have not developed an appropriate guide for a production and marketing strategy. These strategies would provide guidance to those looking to start their own business and include information such as the target market, competitors, and marketing strategies for building a successful business. Despite the efforts of MSR and other organizations, employment opportunities in Katutura are still scarce. Poverty is still rife in informal settlements, with the unemployment rate remaining relatively stable over the past five years (Namibia Economist, 2016). If research engages current entrepreneurs, develops a desirable product, and provides production and marketing strategies, entrepreneurship programs will be more successful in creating opportunities for self-sustainability.

This project will investigate existing research gaps to assist MSR in providing a business opportunity for unemployed men and women to create a marketable product from recycled materials. This investigation will achieve this objective through discussions with MSR, design prototyping with MSR members, and interviews with existing business owners, potential

entrepreneurs, and target customers. The team will supplement these interviews with background research on self-employment and entrepreneurship in Windhoek and Katutura. After collecting this information, we will analyze entrepreneurship strategies around Windhoek, design and analyze a marketable product made from recycled materials, and recommend a production and marketing strategy for MSR members to manufacture, market, and price the final product.

## **CHAPTER 2: BACKGROUND**

This chapter explains the historical and economic contexts of unemployment in Namibia, describes the work of MSR, and examines recycling processes in Windhoek. A history of colonial rule and apartheid control left many black and colored Namibians living in informal settlements around large cities, where employment opportunities are scarce. MSR has worked with residents of these informal settlements since 2007, providing them with skills training, and connecting them with employment opportunities. MSR has worked on entrepreneurship projects in the past, and aims to take advantage of existing waste materials for future projects. The city of Windhoek does not have a government-run recycling program, but commercial recycling companies collect materials for processing in South Africa. Finally, this section discusses organizations across the globe who have proven the viability of businesses that produce goods from recycled materials.

### **2.1 History and Economics of Namibia**

This section discusses the historic and economic context of entrepreneurship in Namibia. It describes the history of informal settlements such as Katutura, examines the formal and informal economies of the country, and describes current entrepreneurship projects in Windhoek that focus on environmentally friendly practices.

#### **2.1.1 History of Katutura**

The roots of informal settlements in Namibia can be traced back to the country's Dutch colonization in 1883. European colonization created a socioeconomic structure in which indigenous people were coerced by whites into becoming unskilled, low wage workers. This structure held true after Namibia came under South African rule in 1948. Under South African control, the apartheid laws segregated Namibia. Races were separated and whites controlled the government despite being less than 15% of the total population. During apartheid, blacks were not allowed in the city of Windhoek except to work (Pendleton, 1996). Black employees traveling into the city were required to carry a kopf ('head') card—only obtainable if a man had work in the city—to be allowed over the bridge and into downtown (Hayne as cited in McIntyre, 2015). Police could ask any black or colored man in Windhoek to produce his kopf card. If he did not, he could be jailed or fined.

During apartheid, ‘locations’ were areas outside the city where the indigenous Africans lived apart from whites. Ethnic differences further segregated these locations into smaller communities. The largest location was ‘Main Location’. In the 1950s, the Windhoek government closed Main Location because the city was expanding towards the informal settlement and the city needed the land. Residents opposed the closure because they did not want to lose their homes. Although meager, these homes were valuable to the residents who owned them. Main Location residents protested the closure and boycotted municipal busses, beer halls, and buildings in Main Location. Demonstrations lasted until December 1959 when a protest led to a police shooting, killing 11 people and injuring 44 (Pendleton, 1996). After this incident, the residents agreed to move north of Windhoek, to Katutura, as shown in Figure 1 (Pendleton, 1996). In Otjiherero ‘Katutura’ translates to ‘the place we do not stay’ (Kemper et al., 2002). The name reflects local attitude towards moving from Main Location to Katutura (Pendleton, 1996).

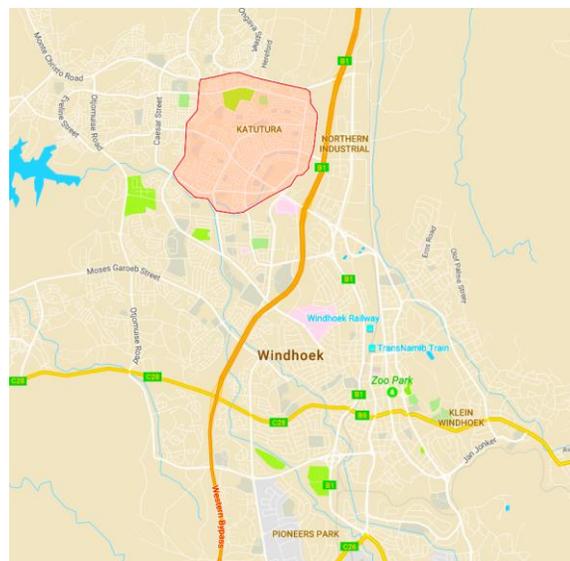


Figure 1. Map of Katutura (Google Maps, 2017)

The official population of Katutura in 2015 was approximately 40,000 but the unofficial population was closer to 200,000. These estimates vary because it is difficult to track statistics in the informal settlements, and many people come and go from the city (Hayne as cited in McIntyre, 2015). Many rural-dwelling black and colored Namibians moved to urban areas, such as Windhoek, looking for work. Once they arrive, however, they cannot not afford to live in the city and end up in peri-urban areas such as Katutura. Life in Katutura is similar to life in rural

Namibia than the modern city life of Windhoek. Within Katutura, cultures cluster together and there is less access to modern amenities such as electricity, running water, technology, and permanent housing, as shown in Figure 2. Figure 3 is a map of Katutura from 1996, showing that the ethnic boundaries set during apartheid lasted even after independence (Pendleton, 1996).



Figure 2. Katutura in 2016 (African Desk, 2016)



Map C: Katutura

Note: Areas 1, 2, 3, 4 and 5 represent old Katutura. The above names and their boundaries as indicated on the map are the generally-recognized names and boundaries within Katutura. This map is based on an earlier map of areas by the author, a map by C. Fröhlich, and the municipal map of Katutura.

Figure 3. Map of Katutura (Pendleton, 1996)

In addition to work, migrants come to Katutura for schooling. Though Katutura and the surrounding areas have schools, many families cannot afford a uniform or educational fees, so their children cannot attend school (Hayne as cited in McIntyre, 2015). As a result, Katutura residents are vastly uneducated and only about 2% of urban blacks go to secondary school (Pendleton, 1996). Most men and women in informal settlements are unskilled laborers who lack funds for training.

Life in Katutura is vibrant despite a challenging history. There are two markets in Katutura: Soweto, on Independence Avenue, and Kakukaze Mungunda Market, on Mungunda Street (McIntyre, 2015). Popular businesses in these markets are food vendors, clothing stores, and hairdressers. Social life is centered around weekends and ‘shebeens,’ as seen in Figure 4. A shebeen is an informal bar, often built onto an existing home (Pendleton, 1996). Shebeens typically serve homemade alcohols made from corn grown in the owner’s small yard such as toambo, a maize beer (Hayne as cited in McIntyre, 2015).



Figure 4. (Left) A shebeen on Eveline Street in Katutura (Lang, 2013). (Right) A toddler helping his mom serve Mopane (worms) at a Katutura Market

## **2.1.2 Formal and Informal Economies in Namibia**

### *2.1.2.1 Market and Currency*

Before understanding the economy in Namibia and Windhoek one must understand the currency. The Namibia pegs its dollar to the South African rand, which provides stability as the rand's inflation rate is relatively low. Perhaps the most conspicuous disadvantage of the Namibian dollar being pegged to the rand is that the country cannot create independent monetary policy to stimulate the economy (Nunuhe, 2016). This restriction is a hindrance, particularly for a country with high unemployment, because it limits the government's feasible approaches to curb unemployment.

A large economic gap exists between the city of Windhoek and the informal settlements. The average net monthly disposable salary after tax in Windhoek is almost N\$9,000 (Numero, 2017), while the average net monthly income in Katutura is N\$1,000 (Faes, 2013). Table 1 shows the average monthly expenditures of 101 Katutura residents, while Figure 4 illustrates an estimated distribution of expenses in Katutura.

Table 1. (Left) Average monthly expenditures of Katutura residents (Kaes, 2013)

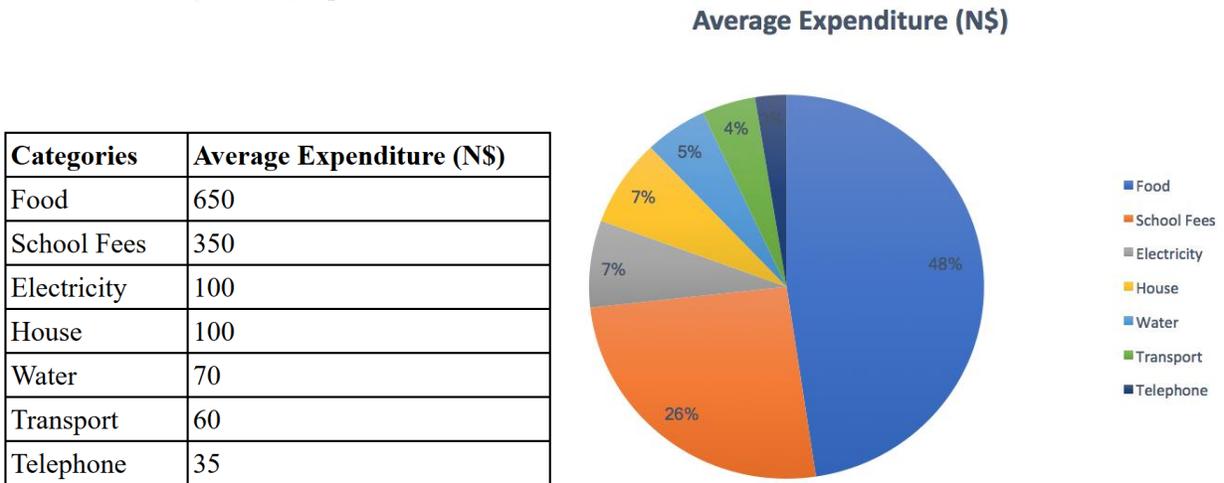


Figure 5. (Right) Average expenditures of Katutura residents (adapted from Kaes, 2013)

Markets vary greatly between Katutura and Windhoek itself. Figure 5 exemplifies that households spend the majority of their income on food. Additionally, more than half of those in Katutura are involved in subsistence farming (Kaes, 2013). The typical cost of goods and services in Windhoek is shown in Table 2. These commodities are out of budget for most people in Katutura. However, this information describes the formal market within Windhoek.

Table 2. Prices of Common Commodities in Windhoek, Namibia (adapted from Numero, 2017)

<b>Prices of Common Commodities in Windhoek, Namibia</b>			
<b>Commodity</b>	<b>Average Cost (N\$)</b>	<b>Range Low (N\$)</b>	<b>Range High (N\$)</b>
<b>Restaurants and Markets</b>			
Meal, Inexpensive Restaurant	1000	70	150
Meal for 2 People, Mid-range Restaurant, Three-course	400	252	500
Domestic Beer (1 pint draught)	20	15	20
Cappuccino (regular)	22	20	25
Coke/Pepsi (11.2 oz small bottle)	10	9	15
Water (11.2 oz small bottle)	97	7	12
Milk (regular), (1 gallon)	63	57	76
Loaf of Fresh White Bread (1 lb)	9	86	11
Eggs (12)	31	21	40
Chicken Breasts (Boneless, Skinless), (1 lb)	29	26	34
Bananas (1lb)	10	7	14
<b>Transportation</b>			
One-way Ticket (Local Transport)	10	10	20.
Gasoline (1 gallon)	44	424	46

### 2.1.2.2 Employment

According to the 2014 Namibia Labour Force Survey, 27% of Namibians are unemployed. Before independence, segregation laws prevented women from working in the city. Therefore, women needed to find employment to sustain themselves at home, which caused an increase in unemployment as they could not easily find jobs (Niikondo, 2010). As the nation progresses socially, more women are entering the workforce, increasing the overall amount of unemployment (Mwinga, 2012).

More people are unemployed in cities than in rural areas, the majority being unskilled workers (Namibia Labour Force Survey, 2014). Unemployed Namibians move from rural areas in search of better employment opportunities, leading to higher unemployment in urban areas than rural areas. Between 2004 and 2015, the percentage of Namibians living in urban areas grew from 35.67% to 46.7% (Statista, 2015; CIA World Factbook, 2017). When these low-income, rural Namibians come to cities for employment, they often find that there is not enough land to settle on, causing informal settlements to expand (Niikondo, 2010). A survey of 190 people living in shack-dwellings in Windhoek found that these migrants typically feel like transients; they feel that they will not live and work in this settlement forever, or that they must

live somewhat like their former rural life (Niikondo, 2010).

Low levels of education significantly reduce the chances of gaining formal employment. The unemployment rate for individuals with university education or teacher's training is much lower than that for people with junior, secondary, or primary education (Kaze, 2014). Therefore, Budlender (2008) theorizes that unemployment may not be caused by the lack of jobs but rather by the lack of correct skills for the jobs available.

### *2.1.2.3 Informal Economy*

The high unemployment rate and large scale rural-to-urban migration in Namibia causes people to make a living in the informal sector, which provides income for more than half of Namibians. The term informal sector refers to “The production and employment which takes place in unincorporated small or unregistered enterprise” (Chen, 2012). An informal economy includes all units, activities, and workers in the informal sector (Chen, 2012). Informal jobs are not subject to standard labor legislation, income taxation, and social protection or employment benefits specified in a national definition (Budlender, 2008).

Retail and distribution dominate the Namibian informal economy. Manufacturing is not a predominant practice in the informal sector mainly because of past apartheid policies, which were designed to secure cheap black labor for the white-dominated mining, agriculture, and manufacturing industries (Ministry of Trade and Industry, 2006). Eighty-three percent of the population working in the informal sector is engaged in agriculture and fishing industries, while ninety-three percent of the population is in private unincorporated enterprises (Kaze, 2014). Occupations not in the informal sector include agriculture used for barter, enterprises using high technology, and professionals such as doctors, lawyers, and dentists (United Nations, 2007). Some common examples of informal jobs in Namibia include selling Kapana—grilled beef—on the side of the road, offering to slice meat in small stalls, and running a hairdresser, a restaurant, or a bar in stalls rented from the municipality (Shindondola-Mote & Ohlsonn, 2013).

### **2.1.3 Ecopreneurship in Windhoek**

Entrepreneurship in Windhoek has been growing in recent years, with many ventures seeking environmentally friendly opportunities. This section examines the idea of “ecopreneurs”—entrepreneurs who focus on ecologically conscious projects (Pastakia, 1998)—and explores two recent entrepreneurship programs in Windhoek.

There are two types of ecopreneurs: commercial ecopreneurs and social ecopreneurs.

Commercial ecopreneurs seek to maximize gains from eco-friendly businesses, whereas social ecopreneurs focus on promoting green ideas or technologies (Pastakia, 1998). Often, these enterprises are shaped by forces from four stakeholders: investors seeking green opportunities, consumers purchasing sustainable products, citizens exercising environmental activism, and governments regulating harmful industries (Pastakia, 2002). However, one of the biggest barriers to ecopreneurship is consumer resistance, which is particularly high when eco-friendly products require a change in lifestyle (Pastakia, 1998). Green products that substitute for existing products without systematic changes or cost increases are more accepted by consumers (Pastakia, 2002). In order for ecologically conscious ventures to succeed, producers must adapt to the market forces, and ease customer resistance.

Existing entrepreneurship programs in Windhoek provide opportunities and promote eco-friendly business ventures. Havana Entrepreneur was a two-year project focused on promoting youth entrepreneurship in Havana, an informal settlement in the outskirts of Windhoek (Winshiers-Theophilus et al., 2015). The Havana project included challenges inspired by the American reality game show, *The Apprentice*. Two teams of youth from the Havana Community competed in four entrepreneurial challenges: develop a business plan for the Havana community center, sell second-hand clothes locally, manufacture products out of recycled material, and take tourists on a tour through Havana. Upon completion of each challenge, judges rated the groups based on their marketing, presentation, teamwork, and creativity skills. For the challenge on manufacturing products out of recycled material, participants collected newspapers, light bulbs, plastic bags, bottles, and cardboard. The groups used these materials to design objects that could be used in everyday life, such as a light bulb holder from cardboard, a jewelry box from newspapers, and necklaces from plastic, string, and newspapers (Winshiers-Theophilus et al., 2015).

Another entrepreneurship program in Windhoek aims to improve small-scale entrepreneurship in Katutura over the next two years (Namibia Economist, 2016). Team Namibia, a non-profit that encourages Namibians to purchase and produce quality local goods, (“Overview - Team Namibia” n.d.) will train twenty-five small and micro entrepreneurs to develop their business skills for both existing and informal businesses (Namibia Economist, 2016). The training is sponsored by the Embassy of Finland, which gave N\$1.9 million to help develop businesses and help talented people break out of poverty. Team Namibia hopes to

promote socially and environmentally responsible practices, and support businesses that make a positive impact on the environment.

## **2.2 Men on the Side of the Road**

MSR, formerly known as Men on the Side of the Road, is a non-profit organization in Windhoek, Namibia, whose goal is to reduce unemployment, challenge discrimination, and lift Namibian families out of poverty (Men on the Side of the Road, 2014). This section discusses the history of MSR, provides information about their current members, and explains the trainings and entrepreneurship projects available to members.

### **2.2.1 History of MSR**

A high unemployment rate has caused hundreds of men and women to congregate by the side of the road every day in Windhoek, Namibia with the hope of finding a job for the day (Men on the Side of the Road, 2014). Organizations such as MSR have attempted to decrease the problem of unemployment by providing job opportunities for these Namibians. MSR was established in 2007 by the Dutch Reformed Church in Eros, just outside of Windhoek. MSR has helped over 1,100 men and rebranded in 2016 to increase the number and range of people they are helping (“Men on the Side”, 2016). Previously, MSR’s labor demographic was men physically sitting by the road, but they have since expanded to include women, high school dropouts, and a wider range of people considered unemployed by the government (“Men on the Side”, 2016). MSR provides training programs and resources, which Section 2.2.3 examines. Members gain valuable life skills, attitudes, and connections that prepare them for future self or long-term employment through their use of the programs and services provided by MSR.

### **2.2.2 Current MSR Members**

As of February 2016, Men on the Side of the Road had about 1,580 registered members (Southern Times Africa, 2016). As previously mentioned, MSR recently expanded to include women, as well as youth who have failed the 10th or 12th grade Namibia National Exam. When students fail this test, they are not permitted to continue in the schooling system, decreasing their chances of finding future employment. MSR has been working to register these students to repeat grades 10 or 12 so they can continue their studies and gain a better education, giving them a better chance at finding jobs in the future (Beukes, personal communication, February 2, 2017).

Men and women typically come into MSR with some existing talents such as painting, bricklaying, mowing, gardening, and many other types of manual skills (Men on the Side of the Road, 2014). MSR is constructing an expansive database that includes the specific skills of their members, particular interests, age, and level of formal education. Companies can hire MSR members and apply to become a registered customer, by contacting the MSR staff through their website. Members of MSR are encouraged to accept a wage of at least N\$100 per day (“Newsletter” 2014). MSR hopes that after two years of training and mentorship members have a job connection and are able to support themselves and their families on their own.

### **2.2.3 Trainings for MSR Members**

MSR not only helps members find employment, but also offers trainings to improve technical and life skills. In order to become an MSR member, one must attend a life-skills training and a money-management training (Beukes, personal communication, February 2, 2017). The life skills training focuses on developing communication, interview, and negotiation skills, resume writing, and evaluating the roles and responsibilities of an employee. The money management course aims to further develop members’ existing financial skills and attitudes by providing new insights and perspectives on fiscal management. As part of this program, MSR requires members to complete the “Budget wise, Save wise, Spend wise” course sponsored by the Ministry of Finance (Cline et al., 2010). MSR previously implemented a six-step approach to training, which is now a seven-step approach based on the recommendation of WPI’s 2016 MSR project team. Steps include life skills training, basic English lessons, money management courses, mentoring, and enterprise and entrepreneurship development. Once members complete required sessions, MSR connects them with additional training institutions based on the members’ interests and MSR’s budget (Beukes, personal communication, February 2, 2017). After members acquire sufficient skills in their field of interests, they go through an internship program to apply their theoretical knowledge. After training and experience, members are more likely to obtain formal or self-employment (Windhoek Express, 2016).

In 2016, MSR developed an additional training step called “Pathways to Self-Employment” (Chico et al., 2016). A team of WPI students worked closely with MSR members to develop a program about creating self-employment. This eight-hour course focuses on entrepreneurship, problem solving, and business management (Chico et al., 2016). It helps MSR

members gain the knowledge and experience they need to start their own business. Since many of these skills take more training to develop fully, MSR provides funds for members to take additional training courses at other organizations (Chico et al., 2016).

#### **2.2.4 The Paper Block Project**

In 2011, MSR developed an environmentally friendly alternative to firewood made from compressed paper and sawdust, and marketed the fuel in Katutura (Villar et al., 2012). MSR members sold these fuel blocks door-to-door, but the MSR terminated the project in 2013 (Hunt et al., 2014). A research team from WPI investigated issues with this process in 2014, and found that the major problems included design faults, poor profit structure, and lack of distribution. The paper blocks did not produce a strong enough flame to cook with, door-to-door sales were ineffective at finding customers, and MSR members were left with little profit. The WPI researchers proposed an improved block design, a fairer payment plan for the block producers, and a distribution scheme through existing informal shops at local markets (Hunt, 2014). Despite these changes, MSR discontinued the paper block project due to unsatisfactory performance. Burning the blocks created too much ash, rather than usable coals, and customers stopped buying the blocks (Beukes, personal communication, February 16, 2017).

### **2.3 Recycling in Namibia**

This section examines waste in Namibia, describes existing recycling practices in Windhoek, and examines organizations that create and sell products from recycled materials.

#### **2.3.1 A Growing Waste Problem in Namibia**

Waste collection varies between Windhoek and the informal settlements, and all across Namibia. Windhoek's only formal general landfill, Kupferberg, is located 11 km south west of the city center, shown in Figure 6, and receives formally collected household garbage. Many informal settlements have informal landfills where residents leave or burn their garbage (Hasheela, 2001).

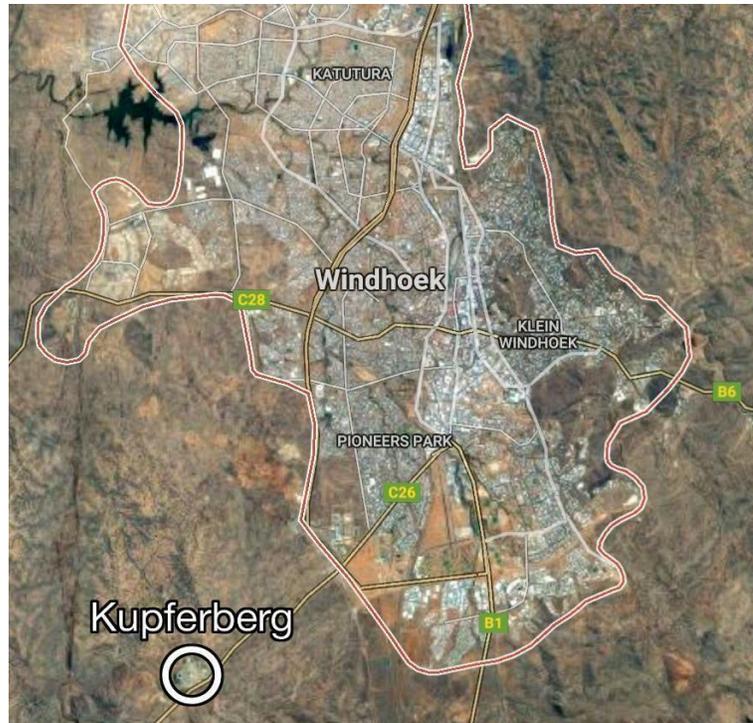


Figure 6. Location of Kupferberg Landfill (Google Earth, 2017)

An estimated 55% of the waste collected in Windhoek is considered non-recyclable, such as garden refuse or food products. Glass, paper, and plastic compose most of the remaining 45% of recyclable material (Hasheela, 2009). Figure 7 shows the breakdown of these materials.

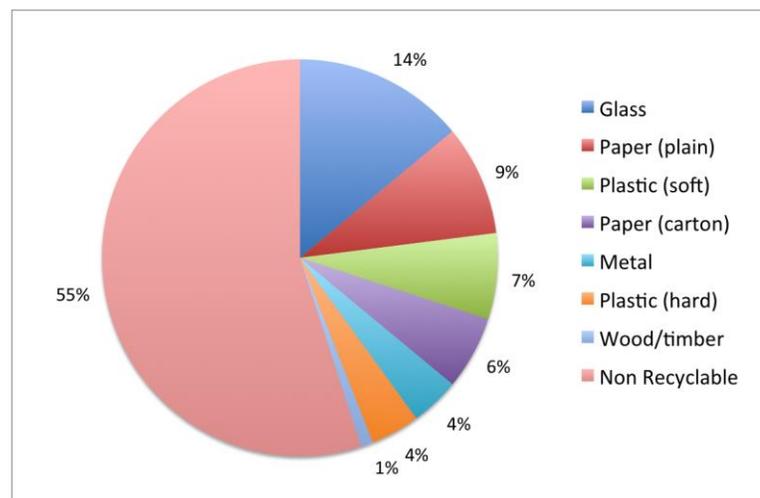


Figure 7. Percentage of Recyclable Materials in Kupferberg Landfill (Hasheela, 2009)

Windhoek waste audits from 2004 and 2008 show that members of high-income groups generate more than twice as much waste as members of medium or low income groups.

Furthermore, the amount of waste generated by all income groups increased over the sampled years (as cited by Hasheela, 2009). Urbanized low-income populations are particularly vulnerable to poor waste management in southern Africa. These problems cause health issues, generate sanitation concerns, and decrease the quality of life (Hope, Lerokwe, 1999).

The Kupferberg landfill contractor hires ‘litter pickers’ to retrieve recyclable items from the general waste areas. However, ‘scavengers’ search through piles of garbage at night for anything edible or valuable (Thijenuna, 2016). Dozens of Windhoek residents scoured the dump to provide for their families after the city government discontinued a food-for-work program in 2013 (Thijenuna, 2016).

Across Namibia, waste collection and disposal varies greatly. The vehicles used range from modern compactor trucks to donkey carts to people carrying items in bags (Hasheela, 2001). In a survey of 46 Namibian towns, 88% had a designated landfill, and the majority burned at least some of their waste. The informal settlements create difficulties for collection, due to their narrow streets and communal ‘skips’, which are trash containers similar to American dumpsters (Hasheela, 2001).

### **2.3.2 Existing Recycling in Namibia**

Namibia has no formal recycling collection service (Windhoek Waste Management Regulations, 2011). Recycling companies send eighty percent of Namibia’s recycled waste to South Africa for processing. Polymer Recycling Manufacturers however recycles polysulfone plastic in Okahandja (Global-recycling, 2017). However, recycling centers and programs have become more popular in recent years. Companies such as Namibia Breweries Limited, The Glass Recycling Company, and Rent-A-Drum have sponsored prizes for schools that collected the most recyclable goods (Recycle Namibia Forum, 2014). Plastic Packaging, Namibia Polymer Recycling Company, and the City of Windhoek Solid Waste Management Department negotiated with local shopping centers to set up recycling stations outside of stores (Schneck, 2009). Each of these stations has four containers: one each for cans, glass, plastics, and paper products. Stores used this as an innovative technique to bring more customers to their shops (Schneck, 2009).

Windhoek also hosts a yearly community recycling day, Windhoek Recycle Day. On this day, Windhoek residents bring recyclables to a gathering place in the city (“Special Day for

Windhoek Recycling” 2016). Furthermore, the Clear Bag System launched in 2010, encouraging residents to separate their paper, glass, plastics and cans (Global-recycling, 2017). After this initial sorting, Rent-A-Drum collects the recycled materials, further sorts, and then sells them to South Africa for recycling (Global-recycling, 2017). Other privately owned companies, such as Keetmanshoop, collect glass, plastic, paper, metal, hazardous material, bio and e-waste as well (Magen, 2010). Overall, recycling in Namibia has a total potential income of N\$54.9 million, based on the amount of recyclable materials and average price paid in South Africa (Hasheela, 2001).

In Namibia, particularly Windhoek, recyclable items such as wooden pallets, oil drums, old tires, and plastic bags are commonly lying in the street. MSR specifically has around 70 oil drums in their old location (Beukes, personal communication, February 2, 2017). These available resources will be a valuable factor in determining a product that MSR members can design and sell as discussed later on in the methodology section of this report.

### **2.3.3 Recycled and Sustainable Entrepreneurial Case Studies**

Many individuals, companies, and organizations use recycled materials to produce crafts and other goods. This section examines three successful organizations that specialize in recycled and sustainable products from countries around the world: Ten Thousand Villages, Sole Rebels, and Repurpose Schoolbags.

Ten Thousand Villages is a nonprofit organization that works with artisan groups around the world, particularly women and socially disadvantaged populations (Wolfer, del Pilar, 2008). Using fair trade principles, they sell crafts that reflect cultural traditions and environmental consciousness (Wolfer, del Pilar, 2013). The term “Fair trade” refers to business principles that benefit economically disadvantaged producers, maintain fair prices, and ensure safe working conditions (World Fair Trade Organization, 2013). In 2014, sales in the United States totaled \$27.6 million (Ten Thousand Villages, 2015), approximately one third of which goes directly to the artisans (Wolfer, del Pilar, 2008). Their customers are typically females, age 30-50, who are well educated and culturally minded (Wolfer, del Pilar, 2008). Many of their products are made from recycled materials, such as newspapers, plastic bags, or aluminum cans.

Bethlehem Tilahun Alemu founded SoleRebels in 2005 to increase job opportunities in Ethiopia. SoleRebels produces shoes and sandals made from discarded tires and the sustainable,

handmade fabrics (Mayer, 2016). The company has achieved market success by opening and sustaining outlet stores in the United States, Taiwan, Japan, Greece, Switzerland, Spain, Austria, and Singapore. The company is expanding, and predicts having over 50 stores by 2018. The founder, Bethlehem Tilahun Alemu, was featured on the “100 Most Powerful Women” Forbes list (Mayer, 2016).

Repurpose Schoolbags is a green initiative, South Africa-based social startup. This innovative company designs and manufactures school bags from recycled plastic bags. The company makes each bag entirely from 20 discarded plastic bags that are washed and heat-bonded before being stitched into durable, waterproof backpacks (Solar School Bags, 2017). The school bags are also fitted with a portable solar panel that charges during the day and can be detached from the bag to power a small lamp for up to 12 hours to give students the ability to study at night (Repurpose Schoolbags, 2016).

These case studies show a potential for viable businesses that sell recycled materials. Despite differing markets, materials, and products, all three organizations succeed in producing and distributing useable and valuable products from recycled materials. Ten Thousand Villages has developed a market in North America, while SoleRebels has expanded globally. Meanwhile, Repurpose Schoolbags has created a product that changes lives. These organizations show the potential for ecopreneurship, and show its long-term feasibility in a global market.

## CHAPTER 3: METHODOLOGY

This project assists MSR (formerly Men on the Side of the Road), a non-profit training and employment organization in Namibia, by developing a business opportunity for unemployed men and women to create a marketable product from recycled materials. The objectives for achieving this goal are as follows:

- Research entrepreneurship strategies in Katutura and Windhoek
- Analyze marketable products and prototype a product made from recycled materials
- Recommend a production strategy for MSR members to manufacture the final product
- Recommend a marketing strategy for MSR members to market and price the final product.

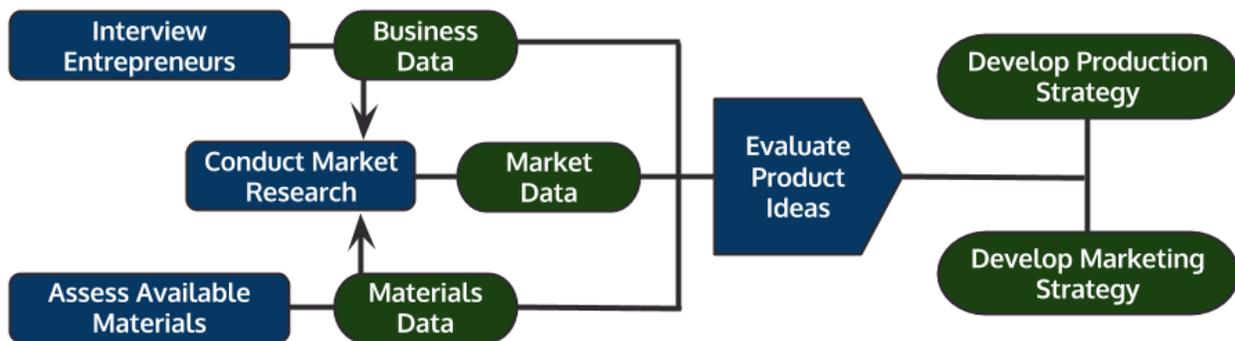


Figure 8. Methodology Flow Chart

Accomplishing these goals relies on discussions with MSR, design prototyping, and interviews with existing business owners, current MSR members, and target customers. The team will work closely with MSR members throughout the entire project, and supplement these interactions with background research on self-employment and entrepreneurship in Windhoek and Katutura. Table 3 shows the anticipated project timeline for accomplishing the objectives and mission of this project.

Table 3. Anticipated MSR Project Timeline

Objective	Task	Prep.	1	2	3	4	5	6	7	8
Research entrepreneurship strategies	Meet with Entrepreneurs									
Design a product made from recycled materials	Conduct Market Research									
	Assess available materials									
	Evaluate Product Ideas									
Recommend a production and marketing strategy to manufacture, market, and price the product	Develop a production and marketing strategy									
	Propose future work									

These general tasks require specific actions and methods to accomplish each one, as shown in Table 4.

Table 4. Task Specifics

Task	Methods	Purpose
Meet with Entrepreneurs	<ul style="list-style-type: none"> <li>- Interview existing entrepreneurs in Katutura</li> <li>- Interview tourist stands in Windhoek</li> </ul>	<ul style="list-style-type: none"> <li>- Understand business strategies, payments plans</li> <li>- Learn about challenges</li> </ul>
Conduct Market Research	<ul style="list-style-type: none"> <li>- Interview target customers</li> <li>- Interview potential producers</li> </ul>	<ul style="list-style-type: none"> <li>- Identify consumer need</li> <li>- Understand consumer appeal</li> <li>- Gauge producer interest</li> </ul>
Assess Available Materials	<ul style="list-style-type: none"> <li>- Observe availability of suggested materials</li> </ul>	<ul style="list-style-type: none"> <li>- Understand which materials to use</li> </ul>
Evaluate Product Ideas	<ul style="list-style-type: none"> <li>- Brainstorm ideas in prep term</li> <li>- Prototype products with high consumer appeal</li> </ul>	<ul style="list-style-type: none"> <li>- Identify available materials</li> <li>- Determine costs, time, and skills required for production</li> </ul>
Develop a production and marketing strategy	<ul style="list-style-type: none"> <li>- Apply existing strategies to chosen product</li> </ul>	<ul style="list-style-type: none"> <li>- Determine production strategy</li> <li>- Determine target market, price, and place of sale</li> </ul>
Propose Future Work	<ul style="list-style-type: none"> <li>- Recommend a product to sell and how to sell it based on the production and marketing strategy</li> <li>- Recommend possible producer skills and trainings</li> </ul>	<ul style="list-style-type: none"> <li>- Assist MSR by providing a business opportunity for unemployed men and women to create a marketable product from recycled materials</li> </ul>

### 3.1 Research Techniques

This investigation will utilize multiple techniques to gather information and make decisions. These techniques include: shared action learning, asset-based community development, oral history interviews, observations, and community focus groups.

**Shared action learning** is a method of research that engages with communities to promote action and cooperative development (Jiusto, McCauley, Stephens, 2013). This method suits research that has local applications, involves a range of stakeholders, and requires action by the community. By understanding social and cultural contexts, working with local communities in shaping the research, and creating action that involves the community members in the research, shared action learning can address real-world challenges in intricate environments (Jiusto et al., 2013). Throughout the following methodology, the team will incorporate shared action learning by having MSR member representatives involved in each step.

**Asset-based community development** (ABCD) develops communities by recognizing existing underutilized resources. ABCD is appealing because it leverages local support, as opposed to an outside source. Local residents identify existing assets such as community leaders, programs, and resources. Then, researchers use these resources to address perceived weaknesses in the community (ABCD Institute, n.d.).

**Oral history** is a firsthand account of personal experiences that provide the interview with a historical context (Lummis as cited in Mckenzie, 2005). Collecting oral history suits entrepreneurship research as it provides firsthand insight into the perspective and substantive issues related to starting a business (Mckenzie, 2005).

**Observations** are the outcome of attentive watching and require few resources to carry out. Researchers record details they witness in a methodical manner. In this project, observations will take place in Katutura and Windhoek to determine the quantity of recyclable materials available and the prices of local items. The specifics of each observation type are discussed in sections 3.2.2 and 3.2.4.

**Focus groups** exemplify the thought process and opinions of a group of people as they are asked about a product, service, or idea (Nagle and Williams, n.d.). As a part of market research, team members will ask focus groups of MSR members for their thoughts and opinions about potential products in an inclusive setting.

## 3.2 Objectives

The following sections discuss our methods for accomplishing the specified objectives.

### **3.2.1 Researching Entrepreneurship in Windhoek and Katutura**

The first step in this project is to research entrepreneurship in Windhoek and Katutura.

The necessary subtasks include:

1. Identify existing entrepreneurs, explore existing entrepreneurship programs and find government agencies and organizations that support small scale enterprise.
2. Interview possible entrepreneurs and organizations.
3. Interview street vendors.

MSR has agreed to help identify three to four entrepreneurs to meet in Katutura. Once in Windhoek, the project group will seek out additional individuals who have started their own business. The ideal interview candidate would be an entrepreneur who uses recycled materials, such as someone who sells chairs made from wooden pallets. The team will also conduct research on existing organizations that promote entrepreneurship. Team Namibia, an organization promoting entrepreneurship in Katutura, has agreed to arrange a meeting in Windhoek. Furthermore, the team will explore government agencies and organizations that support small-scale enterprise.

Once the team identifies possible entrepreneurs and groups, the next step is to conduct interviews. Some of the MSR members involved in this project will accompany us on the interviews. To conduct interviews, the group will use the oral history approach. The interview questions can be found in Appendix A. In order to make interviewees feel more comfortable, the project team will share personal stories and pictures of their families before asking entrepreneurs about their stories. The group will also take videos, audio recordings and pictures of the interviews if the entrepreneurs grant consent. Moreover, the group will interview the representatives of Team Namibia and other organizations with related work to determine their strategies for promoting entrepreneurship.

The group will interview three to four street vendors by traveling through Windhoek and Katutura. Street vendors sell goods to the public on the side of the road with a temporary static structure such as a stall (Asiedu et al., 2008). The team will interview the street vendors with the same methods as described above, to determine how the experiences and business of each group

differ. Interview questions can be found in Appendix A.

The team will analyze the interviews for common themes, strategies, and key players. Using a coding method, the team will review the notes and transcripts to identify the commonalities. The team will then discuss and analyze the frequency and quantity of each theme, and identify important information.

At this stage of the project, there will likely be challenges. One potential problem is being unable to find enough entrepreneurs and organizations with related work. Another possible obstacle is the entrepreneurs and street vendors may not be willing to share their stories and sales strategies with the project team and MSR members. If these issues occur, the team will work with MSR to use previously interviewed entrepreneurs and vendors.

### **3.2.2 Products to Make from Recycled Materials**

After collecting the interview data, the project group and MSR members can begin to evaluate viable products to produce. In order to choose the products, we will:

1. Brainstorm and research a list of potential products
2. Conduct market research
3. Determine recyclable materials
4. Determine additional resource needs
5. Analyze viable products
6. Prototype with the MSR members.

Brainstorming a list of potential products began in the prep term and will continue into the first week in Namibia. These ideas will stem from research on do-it-yourself projects from outlets such as Pinterest and Instructables.com. The team will bring a list of products, complete with pictures, to Namibia to show MSR and the members. Before presenting possible products to MSR members, the group will discuss any thoughts and ideas the members might have. It is important to avoid narrowing down the list of possible products before gathering opinions from MSR members and staff in the first stages of the project.

Starting in week two, the project group and MSR members will conduct market research at local markets and craft fairs in Katutura and Windhoek to identify a customer need and understand customer appeal. The team will interview three to four sellers at these markets and craft fairs to gain a broader understanding of their entrepreneurial experience. The interview

questions for these entrepreneurs can be found in Appendix A. These interviews will help the team gauge competition, consumer demand, and the target customer.

In the first week the team and MSR members will determine the materials, tools, and resources available for MSR members to use when making their product. The project team and MSR members will find locations where recyclable materials are readily available by going to dumpsites and walking around Katutura and Windhoek. The team will then work alongside MSR members to gather usable materials for later prototyping. The team will record the amount of time it takes to gather materials and how the members gather these materials. The group will observe if the materials can easily be carried by hand, or if transportation requires other methods, such as a cart or bag. If there is a monetary cost to gathering materials, it will be evaluated with the MSR members. The group will count and list the trash items in a measured area. Group members will take pictures to supplement written observations.

After assessing the materials and tools that are available, and evaluating the consumer market, the team and MSR members will analyze potential products and prototype at most three ‘finalist’ products. MSR has offered their warehouse for storage and manufacturing, and the project group will work alongside MSR members to create product prototypes, while documenting the process with notes, photographs, and videos. During the analysis, the project group will consider producer interest, production cost, skill and tool requirements, production time, profit margin, material quality, consumer need, consumer appeal, and market competition. Then, the team will conduct focus groups with MSR producers to discuss their interest, how the materials will be collected, and which products they like the best. The team will use a pairwise comparison chart and Pugh analysis to organize and inform the group’s analysis. An overview of the comparison chart and analysis can be found in Appendix B. This prototyping method allows everyone involved to understand the feasibility of each production method and create instructions for production of the final product.

During this stage of the project, there are certainly obstacles that could arise. It is possible the products in the hypothesis are not suitable for the market or that the proper tools are not available to the MSR members. The product could be too difficult to produce or the members could not have the proper training to use the tools. The chosen products could also take too long to make or the process for creating them could be too complex. The project group will assess these issues throughout the project and, if necessary, address them by brainstorming additional

products. By the end of this step, the project team will recommend one product, and proceed to develop a production and marketing strategy.

### **3.2.3 Develop Instructions for Product Production**

A production plan is a set of instructions that outlines the methods of gathering raw materials, manufacturing a product and the associated costs. The subtasks involved in creating a production plan are as follows:

1. Identify methods and costs for gathering materials
2. Determine the tools needed to manufacture the product
3. Identify necessary skills and qualifications for production
4. Identify costs associated with production
5. Create instructions for manufacturing the product.

To accomplish these subtasks, the project team will apply the shared action learning technique to create a collaborative plan alongside MSR members.

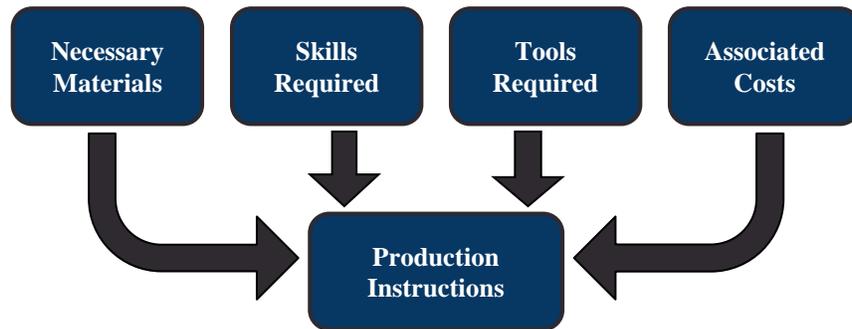


Figure 9. Flowchart of Methods for Production Instructions

As mentioned in section 3.2.2, the project team and MSR members will assess and gather recyclable materials in Katutura and Windhoek for later prototyping. During prototyping, the project team will measure how much space the prototypes required for storage and manufacturing. If multiple MSR members are manufacturing in the warehouse, it is important to know how much space to allot per producer.

As explained in section 3.2.2, MSR members will prototype and manufacture products collaboratively with the team. The team will actively observe and record each step during construction. The team will also record the tools and skills used during construction and if there were any monetary costs required, such as hardware or finishing materials.

The group will compile the notes, videos, and photos from prototyping into a set of instructions. These instructions will be largely composed of photos and graphics with minimal text to simplify translation. A set of production instructions will aid producers in self-sustainability.

### **3.2.4 Develop a Marketing Strategy**

To improve the likelihood of a successful business that will allow self-sustainability, the project team will provide MSR with a marketing strategy that members can use to sell and distribute their products. A marketing strategy is a set of suggestions for target customers, distribution strategies, sales prices, and advertising strategies. The subtasks for this development include:

1. Identify target customers
2. Identify feasible sales locations and strategies
3. Determine an appropriate product price
4. Determine an effective advertising method
5. Compile a marketing strategy.



Figure 10. Flowchart of Methods for Production Instructions

Figure 10 shows the flow of each subtask. Data for each of these steps will come from the previously described interviews with entrepreneurs and residents of Katutura, as well as observations of local informal markets. The interviews will provide information about typical customers, possible sales strategies, and locations. The observations will provide pricing of comparable items, and typical advertising methods.

To identify target customers, the team will collaborate with MSR members to analyze data from interviews with entrepreneurs and potential customers to determine the best fit. Target

customers are those who typically buy from existing entrepreneurs, and have a need for the chosen product. The team will identify customers by geographic location and economic status. Other metrics might include age, gender, family status, education level and occupation. The team will use marketing personas to help communicate about the target customers. A persona is a fictional character that represents the ideal customer.

The team will identify feasible sales locations and strategies based on the target customers and data from interviews with existing entrepreneurs. The ideal sales locations will be near the target customers and fit models used by existing entrepreneurs. These might include selling from home, in local markets, at craft fairs, or door-to-door. Sales strategies might include selling directly, selling through a third party, or selling through MSR.

By observing local markets with MSR members, the team will determine a competitive price for the chosen product based on similar products. The team will note the prices of comparable items and the products being sold in three to four local shops. In the event that local shops do not sell similar products, this investigation can determine sale prices by calculating the target revenue and associated costs, or by surveying target customers about how much they would be willing to pay for the chosen product. One possible problem would be that comparable products are cheaper than the price that makes the chosen product profitable. This would require us to reevaluate the product ideas, and identify a product that could be more profitable.

The group will determine an effective advertising method by identifying effective techniques used by existing entrepreneurs and in local markets. Techniques might include social media, posters, pamphlets, word-of-mouth, or public displays of products. Based on the chosen product, the team will discuss techniques with the producers to determine the most appropriate approach for advertising.

Finally, we will compile and present a marketing strategy to MSR. The project team intends for MSR to use this strategy to help members develop their businesses, satisfy target customers, and properly price their product. MSR will have the information necessary to create a training plan for MSR members to start selling and manufacturing a product made from recycled goods.

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## APPENDIX A: STAKEHOLDER QUESTIONS

### Existing Entrepreneurs

Self-employed entrepreneurs already exist in Katutura and Windhoek. These entrepreneurs have learned about what products sell successfully, how to sell them, how much to sell them for, and what competitors they have. They also have experience in how to start a business and what challenges they faced when starting their business. Interviews with these entrepreneurs are helpful in learning about how to start another business in Katutura.

1. How did you start your business? Did anyone help you?
2. Why did you decide to start your business?
3. What challenges did you face when starting your business?
4. What products do you sell? How much do you sell them for?
5. Do you manufacture the products you sell, or do you buy them from someone else?
  - a. If you manufacture your products, what raw materials do you use?
  - b. If you buy your products, who do you buy them from?
6. Who do you sell your products to? Is that who you originally intended to sell to?
7. How do you market your products? Are there any tips or tricks you have learned since you started your business?
8. Who do you compete with when selling these products?
9. Is there anything you wish you had known before starting your business?

### Entrepreneurship Organizations

Existing entrepreneurship programs in Windhoek promote eco-friendly business ventures. One example is Team Namibia, who is training 25 entrepreneurs in Katutura and other informal settlements.

1. What does your project or organization do?
  - a. How long has your project or organization existed?
2. How did you get involved in this project or organization?
3. How long have you been working in Katutura and Windhoek?
4. What current projects are you working on?
  - a. How long have these projects been going on?

5. What resources (funds, people, buildings, technologies) do you need for your projects, and what are you often lacking?
6. What are the best ways you have found to start businesses around Windhoek?
7. What challenges has your organization faced in starting entrepreneurial projects?
8. How many people were interested in being a part of your program? Can you give us examples of people you worked with?

## Target Market

Once the target market of Katutura entrepreneurs is understood, the project team will interview people in that market to understand the needs and appeals of the possible products. These may include Katutura residents, tourists, or higher-income residents of Windhoek. Pictures of the product ideas will be shown during the interview. Their interests and feedback as consumers will help understand the market for the potential products.

1. Of these products, which would you use the most?
2. What do you like about that product?
3. What do you dislike about that product?
4. Of these products, which would you use the least?
5. What do you dislike about that product?

## MSR members

MSR Members are unemployed men and women living in the informal settlements around Windhoek. They include both older, skilled workers who migrated from rural areas, and younger untrained workers who did not complete high school. This project aims to provide these men and women with a new business opportunity. Through interacting with focus groups of members, the project team hopes to understand their interests and ideas for participating in this business. The project team plans to present them without product ideas, and learn how they feel about each one.

1. Of these products, which would you be most excited about making?
2. What do you like about that product?
3. What do you dislike about that product?
4. Which products do you feel you have the skills to make without training?

5. Would you be interested in partnering with somebody to gather the materials while you make the products, or vice versa? Would you prefer to split both tasks evenly? Or, would you rather work by yourself to gather materials and make the products?
6. Which material would you be most likely to collect: Pallets, tires, bags, or oil drums? Which would you be least likely to collect?

## Katutura Businesses

Katutura businesses already have extensive knowledge of the types of products people are looking for in Katutura. These businesses know how they have made their products marketable and how to interact with the buyers in Katutura. The project team will show them examples of the product ideas to gauge interest in selling them in their stores. The team hopes to gain an understanding of possible competition, sale locations, and proper pricing of a product by interviewing the businesses.

1. What kinds of products do you sell?
2. How do you typically market your product(s) to the people?
3. What is the price range of your product(s)?
4. How many other businesses like yours are nearby?
5. Do you sell your products anywhere else?
  - a. Do you ever switch locations?
6. Did you apply for a business license (or equivalent government registration)?
7. Would you be interested in selling locally made products like these examples?

## APPENDIX B: PAIRWISE AND PUGH ANALYSIS

A pairwise comparison chart is a way to determine the importance of characteristics required for finding the best solution to a problem. Requirements are listed out in a table as categories going both across and down. Then, if the requirement in a row is more, equally, or less important than the requirement in the column, a 1,  $\frac{1}{2}$ , or 0, respectively, is placed in that box. Each row is then totaled, giving the weighting of each requirement. Below are our current list of requirements to be assessed for determining which material would be the best option to use in a design.

List of requirements:

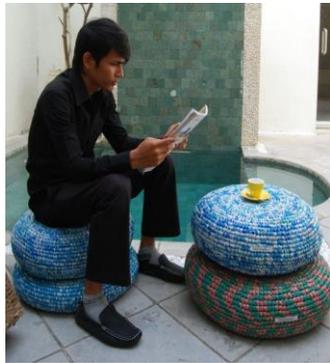
- A. Producer interest
- B. Production cost
- C. Requirement of skills
- D. Requirement of tools
- E. Production time
- F. Profit margin
- G. Consumer need
- H. Consumer appeal
- I. Quality

A Pugh analysis uses the weightings that were determined in the pairwise comparison chart to show which material will be the best option for our project. The weights and each material are listed across the columns, while the requirements from the pairwise comparison chart are listed down the rows. If the material exceeds, meets, or fails the expectations of the requirement in that row, then a 1, 0, or -1, respectively, is placed in that box. Then each column is totaled by multiplying the weight of the requirement by the -1, 0, or 1 that is in each box, and added to give a final ranking for each material. The material with the highest ranking is the one that should be chosen for the design.

## APPENDIX C: PRODUCT IDEAS

### Plastic Bags

Product Name	Image	Source
Plarn Bags		<a href="http://www.plasticbagcrafts.com/make-plarn/">http://www.plasticbagcrafts.com/make-plarn/</a>
Braided Rugs		<a href="http://www.littlehouseliving.com/how-to-make-rag-rugs.html">http://www.littlehouseliving.com/how-to-make-rag-rugs.html</a>
Fused Plastic Bag Tote Bags		<a href="http://makezine.com/2010/03/01/fused-plastic-shopping-bags-to/">http://makezine.com/2010/03/01/fused-plastic-shopping-bags-to/</a>
Woven Pillow		<a href="http://www.weavezine.com/summer2008/wz_su08_JanaTrent.php.html">http://www.weavezine.com/summer2008/wz_su08_JanaTrent.php.html</a>
Braided Jump Rope		<a href="http://childhoodlist.blogspot.com/2012/03/105-diy-plastic-bag-jump-rope.html">http://childhoodlist.blogspot.com/2012/03/105-diy-plastic-bag-jump-rope.html</a>

<p>Soccer Ball</p>		<p><a href="https://www.youtube.com/watch?v=d0GQZFIO4tM">https://www.youtube.com/watch?v=d0GQZFIO4tM</a></p>
<p>Crocheted Sandals</p>		<p><a href="http://www.craftster.org/forum/index.php?topic=87737.0">http://www.craftster.org/forum/index.php?topic=87737.0</a></p>
<p>Beads</p>		<p><a href="http://thenewnew.blogspot.com/2009/04/how-to-turn-bags-into-beads.html">http://thenewnew.blogspot.com/2009/04/how-to-turn-bags-into-beads.html</a></p>
<p>Cups</p>		<p><a href="http://thedesignfiles.net/2011/04/supercyclers-plastic-fantastic/">http://thedesignfiles.net/2011/04/supercyclers-plastic-fantastic/</a></p>
<p>Floor Cushions</p>		<p><a href="https://hipcycle.com/16-stuffed-floor-cushion.html">https://hipcycle.com/16-stuffed-floor-cushion.html</a></p>

## Tires

Product Name	Image	Source
Flower pot		<a href="https://www.pinterest.com/pin/367676757064688063/">https://www.pinterest.com/pin/367676757064688063/</a>
Pet bed		<a href="https://www.pinterest.com/pin/367676757064687998/">https://www.pinterest.com/pin/367676757064687998/</a>
Pot		<a href="https://ecoempire.org/page/2/">https://ecoempire.org/page/2/</a>
Sandals		<a href="http://www.hollowtop.com/sandals.htm">http://www.hollowtop.com/sandals.htm</a>

Chair/table made from a tire



<https://www.pinterest.com/pin/367676757064688002/>

Teeter totter



<https://www.pinterest.com/pin/367676757064688013/>

Tether ball game



<https://www.pinterest.com/pin/367676757064688120/>

<p>Game board</p>		<p><a href="https://www.pinterest.com/pin/367676757064688185/">https://www.pinterest.com/pin/367676757064688185/</a></p>
<p>Swing</p>		<p><a href="https://www.pinterest.com/pin/367676757064688179/">https://www.pinterest.com/pin/367676757064688179/</a></p>
<p>Grill made from tire rim</p>		<p><a href="https://www.pinterest.com/pin/367676757064688133/">https://www.pinterest.com/pin/367676757064688133/</a></p>
<p>Children's horse</p>		<p><a href="https://www.pinterest.com/pin/367676757064688092/">https://www.pinterest.com/pin/367676757064688092/</a></p>

Shelves



<https://www.pinterest.com/pin/AXOy-qBIWQOHEmqo-0JwJdxsrjXuuTAfKGbeoCvei1b1oHaQpWVX00/>

Flower holder



<https://www.pinterest.com/pin/AVhkrJyJMKxEB8wxk5a1Mk4gVcv9ahbNrVRCSzsiBK5FHUgNtRo7E1c/>

Shelves



<https://www.pinterest.com/pin/574701602424631832/>

Basket		<a href="http://www.instructables.com/id/Tired-and-True-Trugs/step7/Fill-em-up/">http://www.instructables.com/id/Tired-and-True-Trugs/step7/Fill-em-up/</a>
Flower pin		<a href="https://www.pinterest.com/pin/506443920580090753/">https://www.pinterest.com/pin/506443920580090753/</a>
Tire mat		<a href="https://www.pinterest.com/pin/519462138244248285/">https://www.pinterest.com/pin/519462138244248285/</a>

## Pallets

Product Name	Image	Source
Coffee table		<a href="https://www.pinterest.com/explore/pallet-coffee-tables/">https://www.pinterest.com/explore/pallet-coffee-tables/</a>
Lawn Chairs		<a href="http://www.1001pallets.com/2017/01/pallet-garden-chair-pair-2-fauteuils-de-jardins-en-palettes/">http://www.1001pallets.com/2017/01/pallet-garden-chair-pair-2-fauteuils-de-jardins-en-palettes/</a>
Table and Chairs		<a href="http://www.1001pallets.com/2016/10/cascade-blue-chalk-painted-pallet-bistro-set/">http://www.1001pallets.com/2016/10/cascade-blue-chalk-painted-pallet-bistro-set/</a>

Book Shelf		<a href="https://www.pinterest.com/pin/250160954281869089/">https://www.pinterest.com/pin/250160954281869089/</a>
Swings		<a href="https://www.pinterest.com/pin/202662051962297655/">https://www.pinterest.com/pin/202662051962297655/</a>
Bed frame		<a href="https://www.pinterest.com/pin/541557923926134299/">https://www.pinterest.com/pin/541557923926134299/</a>

## Oil Drums

Product Name	Image	Source
Couch		<a href="http://edito.seloger.com/lifestyle/ca-buzz/decoration-recycler-des-barils-en-meubles-article-7309.html">http://edito.seloger.com/lifestyle/ca-buzz/decoration-recycler-des-barils-en-meubles-article-7309.html</a>

<p>Chair</p>		<p><a href="https://s-media-cache-ak0.pinimg.com/originals/e7/49/d5/e749d54e91d6a5d210883b9006acea65.jpg">https://s-media-cache-ak0.pinimg.com/originals/e7/49/d5/e749d54e91d6a5d210883b9006acea65.jpg</a></p>
<p>Grill 1</p>		<p><a href="https://s-media-cache-ak0.pinimg.com/originals/b4/28/0b/b4280b70d859fee3438e00faa9a4f233.jpg">https://s-media-cache-ak0.pinimg.com/originals/b4/28/0b/b4280b70d859fee3438e00faa9a4f233.jpg</a></p>
<p>Dresser</p>		<p><a href="http://www.home-dzine.co.za/craft/craft-oil-drum.html">http://www.home-dzine.co.za/craft/craft-oil-drum.html</a></p>
<p>Grill 2</p>		<p><a href="https://www.flickr.com/photos/dancingweaponofmassdestruction/2855598209/">https://www.flickr.com/photos/dancingweaponofmassdestruction/2855598209/</a></p>

## APPENDIX D: OBSERVATION DATA SHEET

Recycled Material: Wooden Pallets
Date:
Start Time:
End Time:
Location Covered:

Location	Time	Tally	Total	Notes

General Notes:
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Recycled Material: Tires
Date:
Start Time:
End Time:
Location Covered:

Location	Time	Tally	Total	Notes

General Notes:
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Recycled Material: Oil Drums
Date:
Start Time:
End Time:
Location Covered:

Location	Time	Tally	Total	Notes

General Notes:
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Recycled Material: Plastic Bags
Date:
Start Time:
End Time:
Location Covered:

Location	Time	Tally	Total	Notes

General Notes:
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