MASTER'S PROGRAMME ENVIRONMENTAL

AND ENERGY MANAGEMENT

Master Thesis

Business plan exploring the opportunities provided by used furniture in the Circular Economy by bridging the timber deficits in Kenya

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List of Acronyms

BOP	Base of Pyramid
CAGR	Compound Annual Growth Rate
EU	European Union
GOK	Government of Kenya
KAM	Kenya Association of Manufacturers
KFS	Kenya Forest Service
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
KWTA	Kenya Water Towers Agency
MOED	Ministry of Industrialization and Enterprise Development
NEMA	National Environment Management Authority
UNEVOC	International Centre for Technical and Vocational Education and Training
UNDP	United Nations Development Programme
UN	United Nations

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WAWERU J.K.

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Dedication

To Wady.

It will be bright with the Circular Economy.

Executive Summary

There are timber deficits in Kenya and the situation can keep worsening if there are no mitigation measures. Wood deficits have been caused by deforestation and poor forestation interventions and the problem will keep growing because the demand for wood is rising for various applications such as furniture manufacture, fuel wood and for construction purposes. The furniture sector employs many people who may lose their livelihoods if there is no wood to keep manufacturing furniture and other wood products. Applying circular economy principles that can reduce increased exploitation of forestry products can reduce the effect of decreased wood production.

A practice-oriented research sought to find out how the widening wood deficits in Kenya can be averted by utilizing circular economy principles and sustainable consumption strategies. Furniture manufacturing in Kenya was considered as a study phenomena where desk research was undertaken from government reports and other authoritative sources. A case study was conducted in Netherlands at OMRIN Estafette, a social enterprise that has implemented the circular economy model and more importantly furniture up-cycling and recycling wood in its operations. Additionally, the researcher used a hands-on imitation experiment in the construction of a functional product, a bee hive (constructed from discarded furniture wood), as an assessment of how a hub within a social enterprise can promote sustainable development while at the same time forming a basis on which a social enterprise can explore both used furniture sales and affiliated services that can involve furniture up-cycling. The hub can train and incubate artisans that can offer the services of repairing and up-cycling of furniture.

After conducting the research, the below-mentioned recommendations can be considered towards founding a successful social enterprise that can source and resell used furniture in Kenya within the circular economy model.

Business Development: The experiment conducted in wood recovery from discarded furniture (the shelving unit) indicated that further opportunities can be explored within a social enterprise that has necessary equipment to repair and up-cycle furniture. A beehive was constructed from wood salvaged from the shelving unit. This kind of approach can be used to further develop a social enterprise into other more sustainable innovative solutions that can create more opportunities.

Innovation: Innovative ways can be used in selling and marketing furniture and other products that are co-created from a social enterprise. The social media platforms such as Facebook and Instagram can be used to reach customers through niche market groups.

A circular ideation hub can be incorporated as part of a social enterprise that resells used furniture where repairs can be undertaken. Simple hand tools can be considered for a start. However, a fully equipped prototyping workshop can be ideal for scaling up remanufacture and repurposing of furniture and other products. A well-equipped prototyping workshop can be used as a capacity building centre, offering short technical training in upholstery carpentry and joinery. It can provide other services such as information dissemination regarding opportunities in the circular economy.

Furniture distressing studio: It can be prudent for a second hand furniture resale store to incorporate a furniture distressing/up cycling studio that adds value to furniture using techniques that could be trending in the market. Distressing techniques can be learned from online sources such as YouTube. .

Employment creation: Employment can be created for the people who work in the workshops, both at the wood pimp studios. Unemployed people interested in learning new skills can apprentice at the studio and earn some commission every piece up cycled and sold. This can happen contrary to Estafette's model whereby the municipal provide the monthly allowance through welfare. This system is non-existent in Kenya at the moment.

Source of furniture: A used furniture resale and repair social enterprise can successfully be set up in Kenya. There are several lessons learned from how it can be made successful after an in depth study at Omrin Estafette. The main difference in the Kenyan context is that used furniture has to be purchased.

Importing used furniture: Additionally, new business opportunities can be created through importing used furniture and therefore promoting the circular economy. Used furniture can be imported from Netherlands, Estafette being a good source because they sell used furniture at an affordable price. Estafette retails the furniture without giving any priority to any specific buyer. It is an open market for all prospective customers.

Collection point and/or warehousing: To effectively collect furniture for export from Netherlands to Kenya, a collection warehouse can be required as the furniture cargo container waits to fill up. This can significantly increase the overhead costs of doing business and therefore sourcing used furniture can be intensified so that the containers can fill ups as fast as possible. However, it is possible to consolidate cargo with another shipper should either party have loose cargo.

Affordable prices: Estafette offers used furniture at an affordable price. This ensures that they sell in volumes. Some customers buy from Poland in bulk with tracks. The price is usually the same unless there is a clearance sale. For a social enterprise to be successful in Kenya, it can be important to ensure the prices are affordable to the target market. Market segmentation can be done through social media platforms where price can be communicated for faster sales and offers.

Abstract

This research seeks to answer the research question: How can a social enterprise that sources and resells used furniture help in bridging wood deficits in Kenya and create employment through furniture up cycling and recycling of wood by applying sustainability and circular economy principles?

The research sub-questions that helped answer the research question are:

- What are the materials mainly used in furniture making in Kenya?
- What kind of furniture does the middle class in Kenya prefer?
- Can a product development hub be established to offer value addition and nurture trade skills in used furniture repair and up cycling?

The research question was answered through a practice-oriented research whose aim was to provide knowledge and information that can contribute to setting up a successful social enterprise that can intervene in wood deficits in Kenya. The research questions were assessed through content analysis and literature review of secondary data from journals and desk research. Additionally, primary data was sourced through observation, interviews and a case study at OMRIN Estafette.

The circular economy offers opportunities to salvage both the biological and technical nutrients in recycled products. The research found that most manufacturers use wood to manufacture furniture. Additionally, the research found that wood can be recovered and be recycled into other useful products through a social enterprise that can incorporate a product development hub and apply part of what was learned at Estafette.

The product development hub can make necessary repairs, polishing and upholstering for the locally sourced furniture. This can create employment by nurturing designers, carpenters and crafts artisans who repair and repurpose used furniture into other functional items as well as selling to the growing middle class consumers. Besides the commercial perspective of the enterprise, the activities involved can facilitate knowledge transfer on sustainability and the circular economy as well as facilitating prototyping and trainings.

The research found that a social business enterprise can be established in Kenya with practical lessons learned from the case study at OMRIN Estafette as discussed in the Executive summary.

Key words: **Circular Economy, Linear Economy, Social Enterprise and Sustainability**

Chapter 1: Introduction

The aim of this research was to provide knowledge and information that can form a basis for establishing a social enterprise (in approximately 1.5 years) that can source (searching, identifying, assessing, purchasing) used furniture locally and from Netherlands to a product development hub in Kenya. The hub can make necessary repairs, polishing and upholstering for the locally sourced furniture. This can create employment by nurturing designers, carpenters and crafts artisans who repair and repurpose used furniture into other functional items as well as selling to the growing middle class consumers. Besides the commercial perspective of the enterprise, the activities involved can facilitate knowledge transfer on sustainability and the circular economy as well as product development through short trainings.

The research also addresses possible interventions to the challenge that the growing Kenyan population[1] will keep demanding furniture that contributes to deforestation that can be reduced by re-using and repairing used furniture instead of using virgin wood. There is currently a deficit of timber production in Kenya and therefore locally manufactured furniture can start declining. The furniture industry creates employment to people in both the informal and formal sectors and they risk losing their livelihood if there is no intervention. It can be worthwhile to save jobs by embracing the circular economy through re-using and up-cycling discarded furniture and wood as a technical nutrient.

This chapter begins with a discussion on the availability of wood in Kenya in relation to manufacture of furniture. This can inform the need to intervene in timber supply as a raw material for furniture manufacturing. The forestry sector that is a source of timber in Kenya is discussed as well as private farms. Forests play an important environmental benefit including water catchment conservation as well as acting as carbon sinks thus mitigating against effects of climate change. They additionally help in adapting to climate change especially where reforestation is done. A review of forest stocks in Kenya is discussed. The exploited wood in Kenya has been reviewed and the timber potential to sustain furniture manufacturing will be analyzed. Factors affecting wood demands have also been discussed.

Background

There is a risk of Kenya transferring its timber deficits problem to the neighbouring countries like DRC and fuelling rainforest destruction due to high timber demands. Kenya has experienced a chronic timber shortage forcing the country to seek costly imports from neighbouring countries. The annual import expenditure on timber in the year 2000 amounted to more than Ksh3 billion ($37.5 million) compared to Ksh4.9 million ($61,250) in 1999. The importation happened with an aim of meeting the rising demand of timber that now stands at 38 million cubic metres annually.

Nairobi, the capital city of Kenya, is estimated to use 80% of its timber supplies from the DRC (Democratic Republic of the Congo). The hard woods, mainly mahogany and mvule are imported from Ituri rainforest area in the Eastern DRC bordering Uganda (Miti, 2010). The logging at Ituri in DRC is to a large extent controlled by local militias who are proxies for Ugandan and Rwandese interests, and the Congolese army. This makes it difficult to legislate in conjunction with other illegal businesses like mining that can lead to massive natural resource extraction.

1 Kenya has a population estimated at 46.1 million, which increases by an estimated one million a year (World Bank, 2016)

Timber arrives in Nairobi on lorries hauling 40ft containers. A container load can contain 30,000 board feet (about 70.79 m^3) of raw wood. It is approximated that two mature mahogany trees can fill one 40ft container. The shipments from DRC to Nairobi can add up to 20-30 lorries each week with some headed for Mombasa (Miti, 2010). Literally, at least 250 trees are felled (with the estimates that two mature trees can fill up a 40ft container) per month for the Kenyan market.

Wood demands in Kenya is affected by factors such as: **Population -** Population increase can translate into more quantities of wood being consumed whether raw or processed. **Levels of income:** Income levels can determine the quantities of goods and services consumed - higher levels of incomes can result to high demand for wood products as well. **Price of wood:** Wood prices in Kenya tend to increase as supply and demand differences increase. This can make wood consumption prospects lower at household and commercial levels. **Processing recoveries:** A significant amount of wood can be lost during wood processing depending on the technology used and the byproducts sought. **Utilization efficiencies:** The utilization methods of wood after processing can promote further losses. This can include sizing and re-sizing through cutting while attempting to achieve the desired product specifications. Saw dust and inappropriate wood off-cuts can result to wastage. **Illegal export/black market trade:** Wood destined for transit can be diverted from Kenya to neighboring countries although reliable reports are hard to come-by.

1.0 The stock forest in Kenya

The area under forest and tree cover was estimated at 4.4 per cent in 2012 (MENR, 2016). About 10-12 percent of Kenya's land area is designated protected area (Institute of Economic Affairs, 2011). Kenya has a total forest land area of 15,189 million hectares. Private farms have initiated most tree planting exercises (10,383 million hectares) which are not farmed commercially and where the density of trees is unknown. These farms that are not well documented service the informal furniture industry. Around 3.5 million hectares are comprised of protected forests, and 1.1 million hectares are closed canopy indigenous forests. With the devolved government, these forests fall under county and national government, and they are subject to the log banning legislation. Only a small share of public forestlands are allocated for timber production (0.107 million hectares) that is regulated by the Kenya Forestry Service (KFS). The forest plantations that are farmed commercially account for less than 1 percent of forestland in Kenya (KFS, 2014). In 1990, area under plantations forests in community and private forest was less than 20,000 ha while plantation forests in public forests were 180,000 ha (FD Economics section reports, 1990). Analysis of current plantation areas show public forest plantations to be 98,578 ha stocked and 39,574 ha un-stocked area while plantations in community and private being 94,146ha indicating a significant shift in plantation establishment from public forests to community, private and farm lands for provision of wood (KFS, 2014).

1.1.0 The exploited (logged) timber in Kenya

Illegal logging can be defined as going against the laws on cutting, processing and transporting timber or wood/forest products. It can include logging in protected areas (such as national parks) or over the allowed quota, by processing the logs (for example into plywood or pulp and paper) without acquiring licenses, and by exporting the timber and wood products without paying export duties. Illegal logging and the trade in illegally logged timber is a major problem in Kenya (KFS, 2014). It causes environmental damage, costs governments billions of dollars in lost revenue, promotes corruption, and undermines the rule of law and good governance. Forests are diminishing fast and the slow growth in plantation forests will keep timber shortage high. This trend is spreading to some East

African countries where some countries that used to be exporters of timber have gradually become importers of the same (Ogweno, Opanga, & Obara, 2008).

1.1.1 Wood demands per sector

The total demand of forest and wood products stood at 42 Million m^3 in 2005. Timber demand for furniture manufacture was at 1.4 Million m^3 in the year under review whereas industrial wood harvested for fuel stood at 24 Million m^3 (Ministry of Environment, Water & Natural Resources, 2013). The construction industry demands timber that was mainly imported from Tanzania for a decade, the year 2000 to 2010 the period since banning of logging in the year 2000. The coffin industry consumed approximately 616,000 trees annually as at the year 2010 (Forest Industries, 2010).

1.2.0 What is satisfied by the local supplies and what is imported

Kenya imports hard wood mainly from Democratic Republic of Congo (DRC). In 2013 Kenya imported 38,507m^3 of hardwood timber at a delivery price of ($420/m3) at border point of Kasindi generating an income of $16.2 million to DRC (KEFRI, 2015). Additionally, Between 2009 and 2013 Kenya imported: 83,729m3 of hardwood timber from DRC; and 192,279m3 of softwood timber, 348,139 treated transmission poles, 8,360 tons of wattle bark, 5,800m3 of logs and 5.8 tons of charcoal from Tanzania (Investment News, 2016).

1.2.1 How much timber is used in furniture making?

A distinction is not yet established on the exact quantities of timber that is exclusively used for furniture making. This is because timber merchants sell indiscriminately without questioning the buyers regarding the intended purpose of the timber (MOED 2015). A prospective buyer can use the timber for construction, furniture making or for any other purpose they deem fit. Timber for construction may be used in roofing, making doors and fittings, flooring as well as interior partitioning. The same timber can be used in making furniture when sawn into respective sizes.

1.3 Importance of the furniture and timber industry for Kenya

One of the important indicators of the growth of Kenya as a country can be the performance of the furniture and timber value chain. This is because the sector provides employment to 160,000 people—cut across the forestry sector to manufacturing. This generates approximately US$452 million of furniture per year US$22 million worth of exports (Investment News, 2016).

1.4 Timber supply and demand in Kenya

Kenya has limited forest resources, characterized by low rates of reforestation and growth. This challenge extends upstream to the wood furniture manufacturers by creating a deficit in raw materials (EPZA, 2005). Timber demand greatly exceeds availability, and the country has an approximate wood deficit of 16.6 million m^3 per annum (Ministry of Environment, Water & Natural Resources, 2013). Apparently, reliable data on the exact demand for timber is not available thus making it hard to motivate investments in commercial reforestation (AFF, 2011). Additionally, local as well as imported timber can at times not be well dried and graded, or could have been harvested too early and therefore compromising on the quality of furniture made from such timber. Kenya therefore faces two problems; quantity and quality of timber (EPZA, 2005). Kenya imports cork and wood from Sudan, Democratic Republic of Congo, Uganda, Sweden, Belgium, Western Sahara, United Kingdom, Tanzania and Germany. The imports falling under Harmonized System (HS) headings 4401-4413 are free of import duty with the aim of protecting depletion of Kenyan forests. However, finished items falling under HS headings 4414-4421 are levied duty at 35% (EPZA, 2005).

1.5.0 The Jua Kali Furniture Manufacturers

The *Jua Kali*[2] sector has created employment to close to 115,000 people, with seventy percent working part-time (UNEVOC, 1997). Most furniture manufacturers in the *Jua Kali sector* source low cost inputs from local timber merchants (and often from illegal markets), and sell directly to a wide spectrum of customers according to their budgets, mostly from roadside showrooms. Around 40 percent of *Jua Kali manufactured* furniture is custom designed by the customer mostly through past references such as ideas from friends. Craftsmen and artisans mostly design the furniture from previous work or copy from a catalogue. The rising cost of raw materials undermine the competitiveness of *Jua Kali* enterprises which can consequently make their furniture an unaffordable alternative for customers. The jua kali sector can be improved for productivity and innovation through better skills and technologies. If a platform for centre of excellence is provided, relevant capacity building and training can help in boosting the skills set in furniture up-cycling. Currently the jua kali can benefit from prototyping facility in development of new products.

1.5.1 Limited Skills and Poor Production Facilities in the jua kali

The jua kali industry, dominated by people living at the base of the pyramid (BOP) is challenged in as far as skills are concerned (UNEVOC, 1997). Not only does poor skills and poor production facilities lead to inferior product outputs, lack of investments results in low levels of productivity. The informal furniture sectors are challenged through outdated production facilities and limited repair, modernization investments and maintenance**.** There is prevalent use of manual tools, which consequently negatively affects production capacity, competitiveness and product quality. Learning can be encouraged at a product development centre that can eventually transfer the skills through training of trainers.

1.6.0 Factors affecting wood demand in Kenya

1.6.1 Population

The demand of a product, being the quantity of goods and services bought at various prices during a certain period of time can be influenced by the number of people who seek it out, thus influencing the consumption. Therefore, population increase can translate into more quantities of wood being consumed whether raw or processed. Human population can change over time and consequently increase wood demand over time. Factors such as rural urban migration, high birth rates and refugee influx can influence a variation in population within the 47 counties in Kenya.

1.6.2 Levels of income

Income levels can determine the quantities of goods and services consumed - higher levels of incomes can result to high demand for wood products as well. Improved incomes can also be associated with changing preferences such as shifting from use of wood fuel to use of liquid petroleum gas for cooking (KEFRI, 2015). Positive economic growth in the last few years in Kenya indicate higher levels of incomes to some people thus resulting to increased wood consumption (World Bank, 2013). The trend of wood consumption is not uniform across Kenya but urban regions such as Nairobi and Mombasa where incomes are higher with greater purchasing capacities. Regions where levels of incomes are low or those with reduced purchasing capacities tend to exploit forest resources at their disposal in an effort to meet wood requirements.

2 Jua Kali in Swahili means 'hot sun'. Over the course of years it has come to be used to refer to the informal or non-formal sector of the economy in Kenya.

1.6.3 Price of wood

Wood prices in Kenya tend to increase as supply and demand differences increase. This can make wood consumption prospects lower at household and commercial levels. However, this trend may not be spread across all regions because some localities produce their own wood by through forestation. The regions where forestation is not an option rely on the depleted wood resources.

1.6.4 Processing recoveries

Wood can be processed from trees as round wood logs whereby it is consumed thereafter. A significant amount of wood can be lost during wood processing depending on the technology used and the byproducts sought (KEFRI, 2015). The loss can be illustrated by this equation:

q***d = fp + pw***

Where

qd - quantity of round wood demanded
fp - volume of finished products or recovered volumes
pw - processing waste

The quantity of wood recovered in form of processed products can be expressed as either low or high recovery rate that can vary depending on the final output. Charcoal has a low recovery rate at 16% whereas poles have a high recovery rate as they require minimal processing. There can be more round wood volumes required to produce same product quantities than a process with higher recovery rates. However, the technologies used in wood processing can determine the amount of wood that can be lost (KEFRI, 2015). This can affect the quantities of round wood demanded. An example can be illustrated by sawing round wood using power saw technology that has a recovery an average of 25% whereas improved technologies such as a band saw could have a recovery of over 48%.

1.6.5 Utilization efficiencies

The utilization methods of wood after processing can promote further losses. This can include sizing and re-sizing through cutting while attempting to achieve the desired product specifications (KEFRI, 2015). Saw dust and inappropriate wood off-cuts can result to wastage. Nonetheless, the off-cuts can be utilized as firewood especially for domestic use. Use of wood fuel can be an inefficient way of using wood due to the wastage especially when used on traditional 'three stone' open fire pits. Additionally, charcoal cook stoves 'jikos' can have a high wastage besides many attempts to encourage communities to adopt improved cook stoves. The improved cook stoves technology is being adopted gradually in some households due to challenges such as accessibility and socio-cultural factors.

1.6.6 Illegal export/black market trade

Wood destined for transit can be diverted from Kenya to neighboring countries although reliable reports are hard to come-by. However, arrests of illegal charcoal dealers in localities such as Kwale have occurred with charcoal destined for Zanzibar. Un-manned parts of Kenyan boarder especially bordering Tanzania have experienced wood smuggling.

1.7 Problem Statement

The growing Kenyan population[3] will keep demanding furniture that contributes to deforestation that can be reduced by re-using and repairing used furniture instead of using virgin wood. Broken and damaged furniture can be repurposed and adapted into other functional products through value addition. There is currently a deficit of timber production in Kenya and therefore locally manufactured furniture can start declining. The furniture industry creates employment to people in both the informal and formal sectors and they risk losing their livelihood if there is no intervention. It can be worthwhile to save jobs by embracing the circular economy through re-using and up-cycling discarded furniture. Wood, as a technical nutrient can also be repurposed into other useful products.

1.8 Research Objective

The aim of this research was to provide knowledge and information that can motivate an intervention in the environmental concerns of wood deficits in Kenya by forming a basis for establishing a social business enterprise (in approximately two years) that can source (searching, identifying, assessing, purchasing) used furniture locally and from Netherlands to a Product Development Hub (the enterprise) in Kenya. The product development hub can up-cycle the furniture (make necessary repairs such as polishing and upholstering) for both locally sourced and imported used furniture where necessary. This can create employment by nurturing designers, carpenters and crafts artisans who repair and repurpose used furniture into other functional items as well as selling to the growing middle class consumers. Administrative staff such as marketers, accountants and human resource officers can be employed too. Besides the commercial perspective of the enterprise, the activities involved can facilitate knowledge transfer on sustainability and the circular economy as well as product development through short trainings. The normative approach of the research involved benchmarking with a case study at OMRIN Estafette at Leeuwarden, a successful social enterprise that is engaged in a business model whereby they re-sell used furniture thus embracing the circular economy in their seven (7 No.) thrift shops in the Friesland Province. The applicability of Estafette's used furniture business model in Kenya has been assessed.

1.9 About OMRIN:

This section gives a brief introduction of OMRIN as a company and how it is linked to Estafette where the researcher conducted the case study research as an intern (see contract at appendix 2). The information was retrieved and translated from online sources.

OMRIN is a company that collects and processes waste in the North of Province of Netherlands. They collect waste for more than 180,000 households in 17 Frisian municipalities, 3 in Groningen, the North Veluwe and Vlaardingen and Schiedam regions and for more than 7,000 companies. Additionally, OMRIN processes waste for about 800,000 households and other companies. OMRIN's ambition is to do everything possible to recycle as much raw materials as possible while generating renewable energy as well. OMRIN closes the material cycles by recycling raw materials, a passion they execute with some precise detail - they work within a chain of networks in different product chains. The name 'omrin', is Frisian for 'circuit', and it already fits well with the challenges faced by the society and by OMRIN as a company.

3 Kenya has a population estimated at 46.1 million, which increases by an estimated one million a year (World Bank, 2016)

1.9.1. OMRIN and the Circular Economy dream

OMRIN reckons that as the world's population grows, commodities will keep becoming scarce and therefore it is prudent to be economical with the available resources. That is why OMRIN partakes in the circular economy dream. OMRIN works with a system that reuses as much raw material as possible and discards as little as possible (see figure 3.1 in appendix 2).

1.9.2 Waste is valuable

In their work as a waste collector, OMRIN interacts with different kinds of discarded items. They find such items to be useful and therefore they embrace waste as a valuable resource; from used utensils, empty vegetable pots to worn jeans and other apparels, used plastic and paper scraps amongst others. Waste is processed into raw materials and it is also used for energy recovery. Technical nutrients in waste can be used to make new products and biological nutrients can be used for energy generation (biogas) and manure. 33 percent of Friesian renewable energy is already produced by OMRIN (25 percent power and steam and 8 percent green gas).

1.9.3 Leading in the Netherlands

OMRIN has set-up some innovative waste separation techniques and high-tech energy recovery installations. For example, the REC (Reststoffen Energie Centrale) in Harlingen generates green power for 50,000 Frisian households and the greenhouse plant in Heerenveen for 10,000 households and green gas for their own vehicles. Notably, OMRIN launched the Estafette cycling shops and environmental streams and consequently they are able to recycle 65 percent of the waste they collect. This makes OMRIN the leading waste collector and processor in the Netherlands. A very important observation is that OMRIN covers most rural areas (about 50%). Their target by the year 2020, working with the municipalities, is to recycle at least 75 percent of the waste they collect.

1.9.4 Sustainability and a unique waste collection method

OMRIN's ambition is to close the loops; raw material to product, from product to waste, from waste back to raw material. They have a conviction that more they close the cycle, the less raw materials will be needed. Therefore as a waste collector and processor they aspire to offer the best in as far as embracing the circular economy is concerned.

OMRIN embraces the sustainability concept not only through closing material cycles but also with their fleet of cars, CO_2 emissions, use of photovoltaic's cells to tap solar energy and use of LED lighting that save on energy. This is proof that OMRIN is at the forefront in implementing the sustainability concept into their operations. OMRIN also prides in their unique method of eliminating waste streams through awareness creation. They disseminate information on the need for waste separation and recycling by combining source separation of paper, biological waste and metal and plastics. With this unique method, they believe that by working together with citizens and municipalities they can extract most of the raw materials in waste. The waste that remains is not thrown away but used in generating renewable energy at Reststoffen Energie Centrale (REC) in Harlingen.

1.9.5 About Estafette

Estafette was established in Leeuwarden in 1997 in cooperation with the municipality of Leeuwarden. Their first store opened shop at Pasteurweg in Leeuwarden. Estafette has grown through to its current chain of seven stores in Friesland Province. Estafette is a chain of thrift stores that are part of OMRIN. They operate seven cycling warehouses in Friesland in the North of Netherlands. The circling shops fit Omrin's ambition to make a maximum contribution to a world in which as much as possible is reused. Their objective is to promote the reuse of goods as well as provide employment to people who may have been out of the

labour market for a while or those who aspire to learn new skills on the job. Estafette strives for a better environment and as much job satisfaction for as many people as possible, who would otherwise not have jobs or an opportunity to gain work experience. Estafette's mission is to provide social needs and contribute as much as possible to charities to achieve a better world.

1.9.6 Working and learning opportunities at Estafette

Volunteers and subsidized employees and a number of permanent employees constitute the work force at Estafette. The lean management structure of Estafette is attached in Appendix 2. Students and any willing person can intern and gain hands on work experience at Estafette. There are several opportunities through various departments such as working: shop attendants, on transport tracks as loaders or drivers, electronics servicing and repairs, furniture sorting, upcycling and repurposing, administrative functions such as marketing and social media administration, clothing and fashion sorting as well as books and publications management. Volunteers can also work in the bicycle sales and repair workshop and at the cafeteria amongst others. Estafette also acts as a teaching model for schools, municipalities and as a social workplace for rehabilitation in liaison with the law enforcement.

1.9.7 Estafette & Educational collaborations

Estafette and Friesland College collaborate in the MBO 1 entrance program. This is a course targeting adults without graduation or qualification. On successful completion of the required study units, attendants can obtain an official MBA degree while at the same time gaining relevant work experience.

1.9.8 Other collaboration such as textile handling

Estafette collaborates with the municipality of Leeuwarden and the police Fryslan, AFAC. AFAC intervenes where misplaced bicycles cause inconveniences in the city and around the train station in Leeuwarden. Bicycles that cause obstruction are seized, registered and stored for a grace period after which they are offered for sale at Estafette. Estafette partners with Reshare (a division of salvation Army), a professional organisation with a social and sustainable character. Both organizations collect, process and handle textiles using containers in Fryslan Province through a comprehensive logistics network and efficient handling of all aspects of operational management.

1.9.9 Variety of products Innovative way of selling unique items

Estafette stores offer an assortment of quality second-hand products at a competitive price with no profit objective because they run as a foundation. All items are sorted, cleaned and priced fairly and prices are not negotiable. Delivery services can be arranged at a small fee. Every so often there are unique items that are identified at Estafette. Such items can be vintage or very rare and are therefore displayed at a special auction space where prospective buyers can make bids for the items at the Leeuwarden shop in form of a letter. The highest bidder takes it home!

1.9.9.1 Structure of the thesis

This thesis comprises of six chapters; **Chapter One** gives highlights and background information on the forestry sector and the timber industry in Kenya - the timber shortage that necessitates importation from the neighboring countries of Tanzania, Uganda and Congo amongst others. A case study as a research strategy was conducted at OMRIN Estafette, Netherlands on the internal processes involved in handling used furniture on receipt from previous owners or from the disposing organization. Estafette is a social enterprise model that is part of Omrin. It recycles and resells many high quality items such as books, furniture, appliances, clothes, toys, antiques or crockery: items that can still be

useful. Therefore, dumped items are given a useful chance at one of the seven cycling shops of Estafette. This helped in understanding Estafette's success story in re-using furniture and up-cycling wood as an enterprise and therefore a brief introduction of OMRIN has been made. The concept of re-using furniture, up-cycling barn wood and construction site raw wood and up-cycling furniture was considered so that the researcher could establish if used furniture can help in bridging timber deficits in Kenya. **Chapter two** reviews literature on the circular economy, sustainability and social entrepreneurship. Product development is discussed as well as the availability of timber in the furniture value chain. The Kenya's informal sector, "jua kali" is discussed and the employment opportunities that can be created through furniture up cycling and recycled wood repurposing. The main focus of this proposal is domestic furniture and therefore a discussion on the demand and supply chain in Kenya is outlined. **Chapter three** outlines the methodology used for the research to answer the research questions with sub-questions and the business model used as a basis for business planning. The methods used in assessing the research questions are listed. The assessment methods, research planning and a table of content for the master thesis business plan are also included in this chapter. **Chapter four** constitutes the findings of the research. This entails the primary data collected at Estafette through the practice-oriented research, case study and interviews conducted. The hands on approach in wood recovery and furniture up-cycling and repurposing is elaborated in detail. **Chapter Five** constitutes a discussion of the findings with a reflection on literature review and findings from primary data collected. An assessment of the applicability Estafettes's circular economy model (in part) in Kenya is discussed. C**hapter Six** concluded the findings and issues recommendations towards establishing a business that can source and resell used furniture, incorporating up cycling, recycling and capacity building.

Two appendixes are included to elaborate on additional details that supported the research.

Chapter 2: Literature Review

Besides an overview of the circular economy, sustainability and product development in relation to the technical nutrients in wooden furniture, this section will discuss the current situation of the furniture market with a description of the global outlook and the manufacture in the Kenya context. Insights will be elaborated on to help understanding of the amount of furniture that can be classified as used or depreciated after a specific period of time and potential of being discarded as more trendy furniture keeps on being manufactured depending on preferences. These insights are mainly drawn from definition of concepts that can be found in the appendix 2.

2.1.1 The Linear Economy

A description of the Linear Economy – the business as usual scenario, A linear economy operates in such a way that resources are extracted, used to make products that are used until they are abandoned and finally dumped as waste. In a linear model, value is derived by ensuring the products are mass-produced and therefore consumed in the same magnitude.

The characteristics of a linear economy are discussed herein.

Linear economy can lead to resource exhaustion and leads to increased extraction of virgin material on one end of the line and increased accumulated of non-degradable material waste on the other end. In Kenya there have been excess quarrying of natural stone and sand in some private land that has led to land degradation. Stone quarrying can also affect the sustainability the community's natural capital; land, vegetation cover and human capital due to pollution thus affect their health (Ming'ate & Mohamed, 2016). This promotes fast, uncontrolled and intensive exploitation of natural resources. Natural resources are essential to the current generation as well as for future generations for economic activities. An increase in population and progressive economic growth can lead to increased need for resources. Therefore, natural resources such as timber can be at threat as indicated in wood deficits in Kenya. The renewability of resources such as wood can benefit from interventions with regard to the economic model. Non-renewable resources such as metal and fossil fuels can be extinct if not extracted with care. Some countries face endless war due to supremacy battles on the control of fossil fuels especially crude oil. The industrial revolution saw a significant growth in manufacturing which consequently led to a huge command of resources such as energy and raw materials. Manufacturers had to achieve economies of scale so that they could reduce the costs of production. However, post World War II, improved technology due to technical innovations eased the cost of resource extraction that consequently brought down the cost of production significantly. However, with the good intentions of improving the society's welfare through improved production systems, the linear economy also led to increased consumption. The products had to be consumed by someone.

Linear economy is also characterized by increased production especially by manufacturers. This trend can be passed on to consumers through advertising and marketing strategies that lead to over-consumption and a lifestyle that encourages discarding useful products just because there can be more products on offer.

The rapid global population growth cannot be ignored in terms of expanded markets for goods and services. Consequently a culture of consumerism has invaded peoples lifestyles where products are bought used and thrown away especially amongst the higher income groups. Consequently, manufacturers have resolved to mass-produce products in such a way that they manufacture faster than the consumers can purchase. Advertising and marketing

agencies have spent sleepless nights to come up with catchy taglines that ensure the consumers fall into the products advertised. Such taglines include 'buy two, get one free.' Some product, especially electronics are engineered in such a way that they do not conform with an upgraded version. The changes could be a charging port on for example an Apple laptop, a software version that does not conform with an older Intel system amongst others, thus **engineering obsolescence** (Slade, 2009). Some products are manufactured not to last. The early light bulb was made to last. The iconic Centennial Light in Livermore, California is a real marvel – an incandescent light bulb produced in the 19th century. After a century of use, the Centennial light still shines today uninterrupted after a century of use. It is the world's most long lasting light bulb. This is testimony that early light bulb innovators like Thomas Edison and Adolphe Chaillet aspired to have products with the utmost longevity. However, in the 1920s light bulb manufacturers such Philips, General Electric, Osram and others across the globe decided to intervene in the longevity of the lightbulb through a cartel in the light bulb market. These manufacturers realized that the longevity of the light bulbs was affecting their sales due to the lifespan of the bulbs as technology improved (Wong, 2012). Therefore, they foresaw a situation where there would be fewer, infrequently burnt out bulbs. That meant there would be replacements and consequently less demand for their products. In the recent years, bulbs are made to give specific hours of service.

Some products especially fast fashion products run out of fashion very fast. Fashion designers and branded fashion houses churn out new product designs every season and therefore most consumers discard their older outfits that can still be usable, some worn only twice or thrice for specific occasions. Some products such as lobby furniture can cease being desirable to the owner because it could have gone out of popular fashion **style obsolescence.** Furniture and home fittings have been a victim of style obsolescence especially amongst the global middle classes that makeover their homes to fit into their social cluster.

Linear economy has seen a rise in products that are discarded even if they are functional. The products could be slightly broken and could require minor fixing. Weekend offers have seen hobbyists purchase cheap tools and equipment that they use only once and dispose them when new products are availed into the market. The disposed items can easily end up as waste because the previous owners replace the items either way. The manufacture of such products leads to extraction of more resources. The consequence of discarding the products is that more waste is accumulated.

The linear economy seem to take advantage of a global economic system whereby manufacturers can acquire cheaper raw materials from locations that offer production inputs cheaply. This has been made possible through international trade and efficient transport systems and availability of transportation options such as through air, sea and rail. Producers have shifted their manufacturing to countries that are deemed to be "competitive" because they offer cheap labour and abundant resources such as raw materials. The global system has spearheaded a shift and relocation of industries such as garment manufacturing to developing countries. The fast fashion industry has not been spared with cotton being produced from India in conditions that are linear by nature. Cotton production in India for example has adverse effects to the environment due to heavy use of pesticides. This happens at the expense of local farmers because pesticides can infiltrate and pollute local water and soil resources thus affecting future production. Intensive irrigation can have a high water footprint due to virtual water exports.

The linear economy's global system has encouraged exploitative practices in countries such as Bangladesh where manufacturing of fashion items are outsources by global brands. This

has promoted unethical and unsustainable environmental and labor practices that are motivated by cheap production costs. The benefits are neither passed on to factory workers nor local environmental protection authorities. The tendencies for outsourced manufacturing in such countries have increased because environmental costs are perceived to be low due to limited environmental and labour law enforcement. Shipment of waste especially electronic waste has been done from the global north to the global south countries. In a press release by UNEP, Kenya is estimated to generate e-waste that amount to 17350 tons per year (UNEP, 2010). The e-waste can include: refrigerators, TVs, personal computers, printers and mobile phones. The challenge with e-waste is that most countries in the global south do not have required technologies to deal with electronic waste when it reaches the end of its life cycle. Personal computers and laptop batteries can be a transferred problem in countries that do not have sufficient capacity to handle such waste. E-waste encompasses differentiated forms of old or discarded electrical and electronic equipment. Such equipment can cause an environmental problem if they are not disposed correctly. They can pollute the air, soil and water - they can cause air pollution when burnt and can become a waste management problem since they are non-biodegradable. Some of the equipments also contain toxic and radioactive elements that can have adverse effects on humans, soil and animals. Besides, the equipment can block water and sewerage channels if not well disposed.

The Linear Economy can be a threat to the global natural resources and this could consequently affect the economic activities if unchecked. We can aim at reducing extraction of raw materials and overdependence on virgin materials through sustainable economic development. The world can safeguard the future of coming generations if we can secure the supplies of natural resources. We can create more value from used resources through embracing a more innovative systematic approach model other than the linear economy model (Braungart, McDonough & Bollinger, 2007).

2.1.2 The Circular Economy

The circular economy concept was important for this research because the study involves re-using wood to mitigate wood shortage in Kenya that has indiscriminate been caused by deforestation thus being an environmental concern. The circular economy concept is relatively new in Kenya. We can have better understanding of the circular economy if we acknowledge where we are coming from; the shift from linear economy to circular economy.

The Circular Economy is an economic concept that emphasizes on maintaining the value of materials throughout the life cycle of a product by a well-planned design (see appendix 1 fig. 3). It is an industrial economy that is intentionally restorative and aims to rely on renewable energy, minimize, track, and eliminate the use of toxic chemicals; and eradicates waste through careful design. (Ellen MacArthur Foundation, 2015). This concept is yet to formally catch up many sectors in Kenya besides having been practiced for several years informally. There are business people who have unknowingly (by definition of the circular economy) been trading in used clothes, electrical appliances, farm as well as construction equipment. Trade is also carried out in used construction materials such as windows, doors, construction bricksand corrugated iron sheets. One of the most prominent circular economy intervention in Kenya has been on solid waste management where the government in collaboration with UNDP has drafted a circular economy solid waste management approach for urban areas through the Low Emission Capacity Building (LECB).

A review of reports by government agencies and stakeholders in business indicate that there is a deficit of timber in Kenya and therefore timber is imported from neighbouring countries for the manufacture of furniture. The demand of furniture will keep rising as the population

grows. Additionally, as the world becomes a global village, tastes and trends can finally influence the choices made in furniture acquisition in Kenya. However, this can have adverse effects of planned obsolescence where furniture that is still in good condition can be disposed for the sake of newer units that are aggresively marketed through social media such as instagram, facebook and twitter amongst others. This situation can be avoided if the public is educated on the circular economy principles as well as the need to use materials sustainably. A social business that can promote a rrefurbish and reuse program where repairable furniture can be absorbed into the market and create employment noting that the rate of unemployment among Kenya's youth is now estimated to stand at 17.3 per cent (Business Daily, 2016). The risks of such a high rate of unemployment is that mass joblessness, especially among the sprightly and innovative youth, can be a drag on the economy as it forces unemployed adults to depend on the few who are employed, thus stretching family resources and consuming savings for future investments. Part of this unemployment gap can be closed through exploring the circular economy where furniture can be assessed and repaired (if there is a need). Additionally, "vintage hunters" can engage in trade of discarded furniture from Europe that can still be of functional use in Kenya and therefore creating a niche business opportunity while at the same time closing the timber deficits. This can be a good way of expanding the life of unwanted, slightly damaged furniture that otherwise would have ended up in the landfills in Netherlands.

A circular economy can convert goods that are perceived to be at the end of their useful service life into resources for others thus closing loops in industrial ecosystems and minimizing waste. At the same time it can change economic logic because production can be replaced with sufficiency. Therefore people can reuse what they can and recycle what cannot be reused. Additionally, repairs can be undertaken on what is broken while at the same remanufacturing can be initiated on what cannot be repaired. A circular economy follows the 3R approach of "Reduce, Reuse & Recycle". Virgin material extraction is reduced as much where possible by using less material, products are made of reused parts and materials, and after discarding a product, materials and parts are recycled. Value retention is the main focus of the circular economy. Therefore by keeping material streams as pure as possible during the complete value chain, there is retention of the value of the material. Pure materials streams can be re-used multiple times to derive a certain functionality or service, thus making only one investment (Stahel, 2016).

In a natural setting, the world is not linear but circular without waste. Natural materials move in cycles (such as water and nutrients abound in nature — discarded matter such as excreta from animals become resources for plants) and therefore a systemic approach that involves different stakeholders from academia, business, consumer and governments can be adopted (Stahel, 2016). Both suppliers and consumers can be considered when deriving a systemic approach in a life-cycle chain so that a closed loop for resources can be created.

There can be two perspectives to classify Circular Economy business models. Firstly, there are those that embrace reuse and extending service life through repair, remanufacture, upgrades and retrofits. Secondly, there are those that turn old goods into as-new resources by recycling and repurposing the materials. People — of all ages and skills — are core to the circular economy model, some unknowingly. In the context of the circular economy, and as stated by Webster, 2015, "Ownership gives way to stewardship; consumers become users and creators" thus people can take care of what is theirs. The remanufacturing and repair of old goods, buildings and infrastructure creates skilled jobs in local workshops. Workers from the past can be resourceful in sharing their experiences through apprenticeship (Stahel, 2016).

The Ellen MacArthur Foundation, founded by the round-the-world yachtswoman since 2010, spearheaded awareness creation about the circular economy to manufacturers and policymakers (see appendix 2 figure 3). Successful Circular Economy concepts have been initiated at small scales in eco-industrial parks such as Kalunborg Symbiosis in Denmark since the 1990s. Other companies such as Xerox has been selling modular goods as services. Caterpillar, the heavy equipment company has been remanufacturing and reconditioning used diesel engines. Consumers can be sensitized more regarding the circular economy concept so that they can embrace it fast, just like it is universally accepted that hotels and public transport sell services rather than goods.

Currently, the Circular Economy knowledge tends to be concentrated in large industries and disseminated across small–medium enterprises (Stahel, 2016). Academia and vocational trainings can be actively involved so that a broader 'bottom up' approach can take an active role in changing the business models towards circular economy. This can be fast tracked by hiring graduates with economic and technical know-how about the Circular Economy.

2.1.3 Sustainability

The concept of sustainability has been discussed in this thesis with an aim of showing the importance of living with harmony in nature. Timber deficits in Kenya have been caused by unsustainable exploitation of forest products. This has led to increased deforestation that has brought about wood scarcity and a threat to many livelihoods. This has contributed to environmental degradation too.

The notion of ‘sustainability’ has been trending for some years having first emerged in *The Ecologist's A Blueprint for Survival*, in 1972. There was need to make modern civilization ‘sustainable’ from influences and motivation of the UN's Stockholm Conference in 1972 and the subsequent international environmental treaties, the United Nations being a trustee. ‘Sustainability’ is related to the future, hence the Brundtland Commission in 1987 defined sustainable development as ‘development which meets the needs of the present, without compromising the ability of future generations to meet their own needs’ (WECD, 1987). The sustainability concept in sustainable development implies on limits - not absolute limits but limitations imposed by current state of technology and social organization on environmental resources. Additionally, the ability of the biosphere to absorb effects of human activities, technology and social organization can be both managed and improved to make way for a new era of economic growth (Basiago, 1995). ‘Sustainability’ has a semblance to ‘the precautionary principle’, affirmed by the European Union (EU) in 1990 in its Bergen Declaration on Sustainable Development, which requires ecological preservation in cases of scientific uncertainty where some damage that may not be undone can be a big. Besides, The Earth Summit in 1992 established ‘sustainable development’ as the most important policy of the 21st century. As complex as it can get in defining the term sustainability, it can be simply put as the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance. Human civilization is acknowledged as the main player that takes up resources in the quest to sustain our modern way of life (EPA, 2017).

In the recent times, the global north is living in a modern, consumerist and largely urban existence and therefore consuming a lot of natural resources day by day. This trend is not sustainable because it disregards future generations, if not put under control. As mentioned earlier, with the world becoming a global village, this trend is gradually creeping into the global south. Therefore, sustainability and sustainable development focuses on having an equilibrium between competing needs - our need to progress technologically and economically, and the needs to protect the environments in which we share with others. We

cannot overlook the future of the three pillars of sustainable development: **economic development, social development** and **environmental protection** while making decisions for the present times.

In the context of this research and with reference to **economic development**, governments can provide incentives for businesses and other organizations to adhere to sustainability guidelines beyond their normal legislative requirements and therefore promote uptake of such concepts without negatively affecting jobs and employability (James, 2014 p4). Moreover, in the spirit of "together we can", to motivate and foster incentives for the average person to act where and when they can; one person can hardly achieve much, but taken as a group, effects in the areas of economic development can be cumulative. It can therefore be discussed in context that economic development can be about providing humanity what they need without overlooking on the quality of life, especially in the global south, and getting rid of the financial burden and "red tape" of doing the right thing (IUCN, 2006).

As we discuss **social development**, we cannot overlook the need of maintaining access to basic resources without compromising the quality of life. Human beings should live in a healthy environment protected from pollution as well as protection from harmful activities of businesses and other organizations. While hot matters such as housing are prevalent, sustainable housing should be available for all the human race in an ideal situation, notwithstanding the income flows which is a key factor in determining the quality of housing in most times especially in the global south. Education is a key element in ensuring that people understand the narrative of sustainable development by motivating people to participate in environmental sustainability. This knowledge can be delivered in modes that the wider population can understand with regards to the local situation. While disseminating such useful information, emphasis can be put on the effects and dangers of inaction in environmental protection.

Lastly, the last pillar of sustainable development that informs this research is **environmental protection.** This pillar connects to the circular economy in ensuring we seal the loops by re-using material and thus avoiding linear consumption where products are mainly used and dumped without much concerns. We can protect the environment through recycling, reducing our power consumption by switching electronic devices off rather than using standby. We can also live sustainably by walking or cycling short journeys instead of taking the bus. Proactive measures towards environmental protection include instruments such as emission trading systems, low carbon mechanisms and nationally appropriate mitigation actions. Self-regulation mechanisms such as green labeling and certifications have been put in place to prevent pollution and to keep emissions low. The world is moving towards use of renewable power sources in homes and businesses. Therefore, environmental protection is a critical concern of the future of humanity and it defines how we should study and protect ecosystems, air quality, integrity and sustainability of our resources and focusing on the elements that place stress on the environment (IUCN, 2006).

2.1.4 Product Development Hub

Used furniture can be up-scaled through several ways such as repainting with similar previously painted colours, applying new finishing techniques or re-purposing into other functional products (The Guardian, 2013). Decorations and Jewelry of furniture can also be done using beads and glassware. In the context of this research, a product development hub is discussed in the views of the facility that will be mandated with up-cycling, training, repurposing and incubating artisans and carpenters engaged in the processes of bringing back the discarded furniture into life. The hub can create apprenticeship positions whereby

interested artisans can learn on the job. It can additionally act as an accelerator in capacity building. It will therefore be explicitly outlined that this facility will deal with wood that would have otherwise been discarded, possibly as wood fuel whereas it could serve further as a functional product in consideration of the timber deficits in Kenya. It is not unusual to find scrap wood that can be repurposed into products that can be used in promotion of multiple industries such as bee-hive manufacturing and garden benches, to mention just a few. This can form a good practical example of the circular economy and a sustainable social enterprise[4] empowering those at the base of the pyramid without necessarily engaging in the eco-rhetoric as a marketing communication as well as avoiding being too preachy about sustainability. While the methodology to perform furniture up-scaling tasks is defined as part of operations, once the results of a prospective business case of a new product conform to the product development center's objectives, the new product team can move on to the development stage. This can be made up of activities that range from prototype development to volume ramp up and test marketing (Business2Community, 2013). The product development centre can be influential in promoting forestation through tree planting initiatives through local communities as part of empowerment as social responsibility initiative besides providing wood as a technical nutrients for future generations.

The Sustainable Development Goals stipulate that decent work can be a building block of development (UN, 2016). As such, work should embraces dignity, equality, fair income and safe work conditions (ILO, 2016). The youth and other unemployed adults need support to prepare and gain exposure for the competitive job market. It is apparent that most disadvantaged constitute the youth. The global youth unemployment stood at 13% that was 73 million youths as at 2015 (ILO, 2015). Due to lack of social support, guidance, encouragement and networks young people can be economically, socially and politically marginalized from the labour market (SOS, 2010a).

For someone to be said to be employable, they either need specific education, some vocational training with tangible skills, some job experience or entrepreneurial activity. There are other soft skills that can be handy such as life skills. These can include decision-making, problem-solving, critical and creative thinking. Additionally, effective communication and the ability to build networks, empathy and the ability to cope with stress come as an added advantage. Young people who aspire to engage in entrepreneurial activities can be supported through incubation hubs especially in the Global South where there are weak formal economies and scarce jobs.

A cross-sectoral policy approach can be important to allow youth and the unemployed access different support and or services from education, social, health, employment and other sectors.

Guidance to build talents and life skills

Towards self-reliance and decent work, young people can gain confidence in their potential and talents, build social and life skills and fill gaps in their education (ILO 2012). It is crucial to equip them with both social and market-related skills to find employment or become self-

[4] A sustainable social enterprise refers to an organisation whose actions and purpose are grounded in environmental, social and financial concerns Inspire2enterprise. (2017, 04 18). *the-5-building-blocks-of-social-enterprise-sustainability/*. Retrieved 09 16, 2017, from http://inspire2enterprise.org: http://inspire2enterprise.org/the-5-building-blocks-of-social-enterprise-sustainability/

employed. This can be secured by ensuring their access to relevant vocational training, and by introducing entrepreneurship programmes into training curricula. Besides formal education, a range of non-formal education opportunities (open learning forums, e-learning, community-based programmes, mentoring and coaching, etc.) can strengthen young people's lifelong learning, starting from their individual needs and moving at their own pace. A product development hub can foster and nurture talents and skills.

2.1.5 Social entrepreneurship

This study found it important to define social entrepreneurship because the research is practice-oriented and therefore it is meant to provide knowledge and information that can contribute to a successful intervention which is to form a basis to establish a social enterprise that can intervene in wood deficit in Kenya. The commissioning person in this context would be the social entrepreneur and therefore a discussion is made so that there can be a greater understanding of who a social entrepreneur is. This can help motivate any person who would want to establish a social enterprise through the paths along the journey.

The concept of social entrepreneurship gained prominence in the 1980s in connection with the work of Bill Drayton[5] at Ashoka Foundation that offers financial solutions to social innovators globally, and Edward Skloot[6] of New Ventures that assists nonprofits in exploring new sources of income (Dees, 2001, 2007; Fulton & Dees, 2006). Moreover, the discourse of social entrepreneurship is making a significant breakthrough and attaining more interest in academics and policy makers because the world is becoming a global village with a globalized economic system. Consequently, social entrepreneurship is evolving within an integrated but complex framework at different levels both nationally and locally. Additionally the concept is drawing political and economic interests in consistence with the social changes occurring at the global, national and local levels.

Dees (1998a) discussed that the concept of social entrepreneurship can imply different meanings to different people. Some social entrepreneurship can exclusively concern not-for-profit organizations whereas some can be for-profit enterprises. Additionally, some people use the term to refer to business owners who incorporate social responsibility into their business planning and operations. Social entrepreneurship can be described as an entrepreneurial activity with an objective of serving a social goal (Austin *et al*., 2006; Roberts & Woods, 2005; Peredo & McLean, 2006; Peredo & Chrisman, 2006). In as much as many authors have tried to define social entrepreneurship, some difficulty can be experienced because the phasing of the definition tends to depend on the authors perspectives (Sullivan-Mort *et al*., 2003).

2.1.5.1 Who is a Social Entrepreneur?

There is a commonly agreed definition among scholars regarding the character of a social entrepreneur as being greatly inclined towards a 'problem-solving nature' (Johnson, 2000). However, it is not enough to have 'problem solving' ambitions without idealistic, forward-looking individuals that are resourceful, innovative, opportunity-oriented and additionally ready to create value and be change agents (Dees *et al*., 2002).

[5] Bill Drayton is a social entrepreneur with a long record of founding organizations and public service. He is responsible for the rise of the phrase "social entrepreneur", a concept first found in print in 1972 Retrieved 08 12, 2017 from https://www.ashoka.org/en/people/william-drayton

[6] Edward Skloot was the founder of the Center for Strategic Philanthropy and Civil Society at the Sanford School of Public Policy, Duke University. He was previously CEO of the Surdna Foundation. Retrieved 08 17, 2017 from http://skoll.org/contributor/edward-skloot/

Other definitions of social entrepreneurs suggest various descriptions for individuals that have taken up 'problem solving' social undertakings. Young (1986) defines, "social entrepreneurs as non-profit entrepreneurs who innovate and found new organizations, develop and implement new programs and methods, organize and expand new services, and redirect the activities of faltering organizations (p. 162)'. However, Catford (1998) opined that social entrepreneurs are people who seek opportunities with street savviness combined with professional skills and visionary insights. A social entrepreneur integrates ethics with tactical trust and is also pragmatic and have the ability to see opportunities, unvalued resources such as empty buildings and available where others do not see (p. 96). Additionally, Prabhu (1998) observes that social entrepreneurs are innovative and can be thorough leaders in social enterprises.

Dees et al. (2002) defined social entrepreneurs as idealistic, forward-looking people who are innovative, opportunity-oriented, resourceful, and value-creating change agents. This description of social entrepreneur, according to Jones et al. (2010) has become one of the most cited descriptions of social entrepreneurs in the literature" (Kadir et al., 2016).

So far we have elaborated on different perspectives that can contribute to the definition of a social enterprise. There are numerous definitions of what a social enterprise can be, some targeted towards social impact, while others narrow down on the use of surpluses. A combination of these elements can lead to what distinguishes a social enterprise from a mainstream enterprise. Social enterprise has become synonymous with non-profit enterprises, social-purpose businesses or revenue-generating ventures that are started with the aim of empowering those at the BOP while at the same time operating with regard to the financial bottom line (Alter, 2003). However there can be need to broaden the definition so that a variety of distinguishing features can be included, therefore we can adapt this definition: *'a social enterprise is a business operation which has social or environmental objectives which significantly modify its commercial orientation' (Smith & Darko, 2015).*

In the context of this thesis a 'business operation' can be defined as a private entity that can derive its revenue from trading (selling goods or services) for profit. There can be some variations in the definition when the commercial perspective is categorized as outlined hereunder:

- Sharing of the financial surpluses (profits) with customers incorporating them as co-owners with the aim to achieve a social objective.
- Explicitly reducing financial profits by paying a premium (above-market) or offering standing orders with guaranteed prices to suppliers, salaries and wage rates and restraining business profits within fixed limits for the sake achieving a social objective.
- Explicitly cross-subsidizing certain customer (for instance those at the BOP) as part of business's policy with an aim to achieve a social objective.

Having an additionality component in context of seeking subsidies from a government, donor or NGO source for the sake of sustaining a business that can otherwise not be viable in the absence of the instruments, thus achieving a social objective. Such a subsidy can be through direct financing or privileged or protected access to markets for example government procurement contracts. Other examples can include preferential award of contracts to women and youth as well as persons with disabilities for instance those challenged visually or in mobility.

2.1.5.2 Social Enterprise with regard to purpose

What is a social enterprise? Before meaning is derived on what a social enterprise is, it can be worth understanding the background of how such enterprises could have emerged and who the stakeholders were. There seem not to be one clear definition of a social enterprise. However, there are many perspectives that can come into play. For instance, a research perspective can entail knowing the subject of the research and the boundaries in defining the social entrepreneurship research topic. Governments, donors and promoters may be keen on the definition of a social enterprise because they may want to ensure that the support and regulation is well targeted. Financiers, including donors and governments support social enterprises based on the financial instruments available such as subsidies, grants, tax breaks and technical assistance amongst others. These instruments can be administered through eligibility criteria that can play a part in the definition of what a social enterprise is.

There are other stakeholders such as client or customers of a social enterprise who play a part in the definition of a social enterprise. This can entail the need to know whether goods and services offered by a social enterprise are fair trade certified or if their products are produced sustainably and ethically. Nonetheless, the definition of a social enterprise may not matter for social enterprises themselves in their daily operations but in the impact of their activities and the strength of their business. However, there must be a clear distinction between the mainstream business and the social enterprise in order to effectively use the social enterprise label and be attractive to clients, government and donors. To help understand what a social enterprise is, it would be prudent to know how the concept came about, resulting into the current usage.

2.1.5.3 Social enterprise tradition

The term social enterprise seem to have gained prominence recently although it is not necessarily new. There is a strong belief that enterprises that operate within a free market are socially beneficial. Adam Smith opined that individuals pursuing their own self-interest can incline towards promoting positive outcomes for the sake of the community compared to interventions that can be nominally hatched out of higher motives: “By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it” (Smith, 1937).

Conventional business operations can have aspects that are not socially inclusive and therefore they may require a revision of their strategies so that tangible impacts to the society can be realized. Such a need to improve on the strategies in order to create the desired impacts have given rise to ‘social enterprises’ where social benefits take precedence to commercial interests. Religious beliefs have played a part in advancing the social enterprise movement. In Islam, Islamic Finance[7], Shariah compliant finance has notably been a major economic sector that can clearly be classified in the context of the social enterprise tradition. Additionally, Cooperative movement in Europe, promoted by Christian ethics in the 19th Century included significant modifications to business operations by improving social impact. These modifications are guided by The Rochdale principles[8] that

[7] Islamic finance is equity-based, asset-backed, ethical, sustainable, environmentally- and socially-responsible finance. It promotes risk sharing, connects the financial sector with the real economy, and emphasizes financial inclusion and social welfare. Retrieved 08 10, 2017 from http://www.worldbank.org/en/topic/financialsector/brief/islamic-finance

[8] In 1844, the original pioneers of the co-operative movement, the Rochdale Pioneers, created a set of ten co-operative principles, known as the Rochdale Principles These principles were intended to guide the activity of co-operatives throughout the world. http://www.campus.coop/index.php/rochdale

govern the co-operative movement. These principles constitute education and training, limitation on members' compensation, democratic control and appropriate use of surpluses. The co-operative movement has evidently been amongst the most widespread growth of social enterprise in the world. There are other motives (mainly in USA and Europe) that have inspired the social enterprise movement such as Fair Trade Movement post Second World War. The fair Trade Movement pushed the agenda of free trade between the global south and global north with an aim of achieving greater social impact with mechanisms such as guaranteed minimum prices paid to global south suppliers and ethical production by exploitation of the non-majority ethnic groups by 'honest' producers. Consequently, Fair Trade aims to streamline the international trade through a socially certified fair trading scheme that accrues maximum benefits to producers.

Similarly, the microfinance movement that partly adapts from private money lending has a modified business model that aims at maximizing social benefit. Their money lending has streamlined local services provision, procedures, quick response and reputational rather than asset collateral in loan acquisition. Money lending social enterprises such as Grameen Bank of Bangladesh has a non-profit structure and cross-financing range of social, educational and empowerment programs from interest income. They therefore offer support and protection to the less fortunate members of the society by optimizing their social impact.

2.1.5.4 Private sector development

Social enterprises can play a role in generating social benefits in businesses by seeking to enhance rather than interfering with the opportunities for private enterprises to excel. Therefore, private sector development approach can promote healthy competition by reducing barriers to business entry and other costs through regulatory reforms. This can consequently improve the business environment. While the business of business is business, a conducive environment can motivate profitable opportunities for those at the BOP and possibly have a ripple effect to the poor producers and consumers. Some economies in the Global South have applied commercial logic through widening their market range by having greater reach thus accessing more people. In Kenya for example, the liberalized telecommunications industry has penetrated the nationwide market through electronic money transfers, M-PESA being an iconic innovation. The education sector has opened up their market and now many people can enjoy low cost private schools that incorporate a social enterprise noble cause. Other enablers have seen the reduction of state subsidies on inputs such as those used in agriculture (seeds, fertilizers and extension services) by developing sustainable input supply markets through the private sector. However, a level playing field can be the best bet where information is circulated openly to avoid cartels that can strangle noble initiatives. Some mainstream business enterprises can have a social enterprise approach that can make it challenging to differentiate the magnitude of business growth. This is evident in the telecommunication industry where Safaricom, a telecommunication company in Kenya has enabled multiple social enterprise platforms such as M-PESA[9] and M-Kopa Solar[10] in mobile cash transfer and renewable energy access respectively.

Retrieved 09 20, 2017 from http://news.bbc.co.uk/local/manchester/hi/people_and_places/history/newsid_8838000/8838778.stm

[9] M-PESA lets people transfer cash using their phones, and is by far the most successful scheme of its type on earth. Retrieved 09 06, 2017, from https://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18

With the private sector development approach, the term social enterprise can lose explanatory power due to the magnitude of growth in the enterprises. Several variants of the use of the term social enterprise in context have seen related terms such as: social business, inclusive business, impact enterprise, sustainable business and social purpose business. These terms can be hard to distinguish from each other because there is a thin line between their objectives.

2.2.0 Kenya supply and demand – A general overview

The East African furniture market is valued at US$1.2 billion and trade in the region is worth US$298 million. The leading furniture producer in East Africa is Kenya (World Bank, 2013). The opportunity to expand Kenya's furniture industry has high growth potential because of the domestic and regional positioning. Kenya can capitalize on the growing local and regional markets in East Africa, other parts of the continent, and beyond with the logistically advantageous geographic position that confers it comparatively easy access to local and regional and international markets by road, rail and sea. There is ease of access to raw materials from neighboring countries and availability of affordable labour force.

2.2.1 Key Stakeholders in the value chain

The furniture value chain in Kenya consists of six core segments. It begins with the forestry sector, and progresses through timber harvesting and transport, timber processing, and timber trading. The furniture industry sources from timber traders and processors, and may sell through furniture outlets or directly to consumers. However, there are stakeholders that are in used furniture such as auctioneers and expatriate

2.3.0 Global supply and demand

The global output of furniture is worth US$480 billion and global trade in furniture stands at US$140 billion (CSIL, 2013). World furniture production has been increasing year by year over the last decade with the exception of 2008 and 2009. Rapid urbanization and increasing purchasing power is driving the demand for furniture in Africa thus accounting for 2.2% of output and 2.8% of trade, with net imports amounting to US$2.5 billion (CSIL, 2013).

2.3.1 Market demand segments

The trends and tastes in furniture are continuously evolving in the context of globalization and innovation. The availability of materials can dictate the ultimate styles and form that the furniture will take. The growing population demographics and family formation, house planning and other building construction that emerge in countries, cities or towns are fundamentally important to evaluate in relation to furniture trends. Dynamics such the role of the home location and the lifestyle enabled by a specific location (office, retail, education and health facilities, etc.). Residents of highly congested neighbourhoods, for example, are likely to have a preference for furniture that is smaller, more compact and easier to transport and assemble in high-rise apartment buildings. The furniture handling aspect is also important to avoid damage while moving

2.3.2 Sources in the EU and/or Netherlands

The furniture industry is essentially an assembling industry that employs various raw materials (wood and wood based panels, metals, plastics, textile, leather, glass, etc.) to

[10] M-Kopa Solar, provides rent-to-own solar energy products that help provide cheap solar power to rural homes. Retrieved 09 06, 2017, from https://www.forbes.com/sites/tobyshapshak/2016/01/28/how-kenyas-m-kopa-brings-prepaid-solar-power-to-rural-africa/

manufacture its products. In the last years, the EU furniture industry has improved the production quality, in terms of technical, design and fashion. The EU-27's furniture manufacturing (Division 31 according NACE rev.2) sector included about 13 000 074 enterprises in 2010 that employed more than 1 million persons. Micro enterprises with less than 10 workers are the most common companies in the sector, representing around 86% of EU furniture companies. Generally, small companies act as subcontractors for larger firms, providing to them components and semi-finished products for the finishing and assembling of furniture.

2.4.0 Consumer behaviour

The objective of this section is to identify and prioritize the factors affecting the consumer behaviour in the purchase of furniture products. This can also help understand why consumers disposed their used furniture. The analysis of consumer trends is becoming a basic input for furniture manufacturers and dealers to correctly orient their offer and succeed with their products. Consumer trends help to predict which product could be launched and to determine the response from potential users. Consumer trends are presented below with the aim to understand better consumer preferences. In order to reach this purpose a literature review has been conducted.

2.4.1 Factors that influence consumer furniture preferences

One of the major issues for the furniture industry is to understand the consumer preferences. As enterprises become internationalized, furniture producers and dealers are faced with a need to analyze the market carefully. It can be prudent to take into account consumer behaviour when a furniture product is designed with the intentions of catching the consumer's sympathy and attention, and ultimately satisfying their preferences.

The major factors that influence the behavior can be grouped in the following according to (Oztop et al., 2008).

- Psychological - motivation, perception, learning, beliefs and attitudes
- Personal - age and life cycle stage, occupation, economic circumstances, lifestyle, personality and self-concept
- Social - reference group, family, roles and statuses
- Cultural - culture subculture and social classes

All of these factors can influence and create certain rules in the sphere of consumer choices. These rules once determined, should contribute to the business ability to catch the scene of the new markets (Oztop et al., 2008).

One of the important factors that can influence furniture selection is individual taste. However, furniture must meet several criteria for a satisfactory selection: it should be comfortable and appropriate for its purpose, it must be functional for possible multipurpose use, there must be enough space for the furniture; it must have a long physical and psychological life, it must be easy-to-maintain and it should be affordable. Furthermore, individuals must have enough knowledge about the product specifications of furniture while making their selection. Factors such as being functional, durable, aesthetic, usable and economic reflect the product value of the furniture. Moreover, as more and more consumers become aware of sustainability, and view it as a relevant factor, the consumer intent and behaviour is changing.

According to Oztop et al., 2008 user behaviour in furniture choice; quality, price and the appearance factor are positioned the top three considerations by the buyers. The aesthetic and symbolic roles were considered most important for consumers. Price has always an important factor, especially in a difficult economic situation especially when a consumer cannot afford new furniture. Reduced housing developments imply that there are few consumers who need furniture. Consumers' preferences differ in function of the socioeconomic, psychological and cultural characteristics. Other factors, such as the product availability, information availability, access, speed of delivery or amount of shopping time required, have an impact on the choice of a retail environment.

2.5.0 Wood and wood-based products

Timber materials used in furniture can be either solid wood or wood-based materials such as panels. Regarding the types of wood, hardwood can be used for outdoor furniture whereas softwood, both as solid wood and wood panels, can be used for indoor furniture. Woods used in outdoor applications are usually durable and naturally more resistant to rain, sunlight, rot and insect infestation. Some woods, such as redwood, cypress, and the cedars, contain chemical compounds that naturally repeal bugs, bacteria, and other agents of decomposition. Others woods such as white oak and black locust have natural physical barriers as rot resistance and moisture prevention. Examples of species used in outdoor furniture are: Red Cedars, Teak, Eucalyptus, White Oak and Acacia (Locust).

2.5.1 Recycled wood

The use of recycled wood is widely spread with trendy design styles in the furniture industry. Many types of chipboard contain recycled fibres. This brings several environmental benefits such as the reduction of raw materials consumption and the related minimization of waste streams coming from forestry, timber production or wood products waste. It has been authored that extra care should be taken when selecting recycled wood, especially from pallets because of the risk of contamination, so it is necessary to ensure the quality of the boards obtained. Wood can also be recycled from construction sites through careful cleaning and sanding into revamped timber that can be used in furniture making. It has recently been fashionable to use barn wood in furniture manufacturing especially where customized commissions are concerned.

2.6.0. The furniture manufacture Industry in Kenya

Furniture making in Kenya can be a huge industry with great potential for poverty reduction and employment creation. Kenya furniture manufacturing falls into either formal or informal classification (MIED, 2015). The distinction of formal or informal classification can be based on the legal constitution of the business enterprises. Formal furniture enterprises are run as limited companies by guarantee or as sole proprietorship – they can typically be small and medium enterprises. Most formal enterprises manufacturers target a niche market that can comprise the middle class and higher income earners. Formal furniture manufacturers mainly operate on designate shop space that they could either be renting or own. Most of them are equipped with latest technology that enable innovation, create prototypes and new products. They can produce quality furniture as per the clients' specifications or per the commission.

Informal furniture manufacturers may not be formally registered and can establish their business while working on a roadside. Informal furniture enterprises are challenged in terms of competitiveness due to the scarce and rising costs of raw materials (MIED, 2015). This can make hand crafted furniture pieces an expensive choice for prospective customers. Informal manufacturers are mostly individual craftsmen who make and sell directly to customers (MIED, 2015). Most of them depend on walk in customers for their sales. Informal

furniture manufacturers can benefit if they are assisted with complex business matters that they may not be adequately prepared to tackle, including finishing, branding, packaging and marketing.

2.6.1. Furniture showroom outlets

Both the formal and informal furniture manufacturers require some place to display their furniture. These are can beat independent furniture chains and retail outlets that sell finished furniture items in the case of formal enterprises, whether locally manufactured, imported or both (MIED, 2015). Literature review from data collected in Nairobi along Ngong Road where there is an open-air mixture of informal furniture-making micro enterprise spread over 1 kilometer, the largest in Kenya, indicate that there are almost 100 furniture businesses employing more than 600 people on permanent basis (Miti, 2010). Informal furniture manufacturers also have roadside (See appendix figure 11) premises near residential areas because they can have easy access to customers (MiED, 2015). The furniture manufacturers assert that they are stronger being together because skilled labour is readily available within their circles. New ideas spread quickly, especially with reference to catalogues of international brands such as IKEA. The designs are adopted into the Kenya taste. The local artisans can easily replicate the designs they see on magazines and catalogues. However, there is a downside to the close proximity of these enterprises to each other. There is a lot of copying from each other and therefore it is difficult to protect unique personal designs. Copyright and patent laws are disregarded and therefore it can be difficult to develop a unique look or signature. However, the more outgoing entrepreneur manufacturers differentiate themselves from their competitors through quality finishing and workmanship.

There are drawbacks in being situated in the open-air road reserve. Harassment by law enforcement officers from the county government can happen (Miti, 2010). Additionally, there can be nuisance from dust, noise and rainfall that can disrupt operations. Prolonged exposure to sunlight can also damage furniture besides constant shifting in and out of the storage facilities The open-air manufacturers do not receive much support or any incentives from the government despite the employment they create (see appendix 2 figure 7). It is hard for the enterprises to access loans to scale up because their location fail in the prequalification criteria where the business is required to provide registered lease agreements which they do not have. At times the enterprises qualify for loans based on the bank transactions they undertake over a given period of time on assessment by the bank. However, the enterprises shy away from the high interest rates that range from 18% to 23%. Therefore most of the furniture manufacturers depend on their saving for expansion (see appendix 2 figure 8). They also depend on the upfront deposits paid by customers as seed capital for the commissioned work.

Some of the manufacturers who have been in the furniture manufacturing business on Ngong road indicate that several logging bans such as in 1999 and 2012 imposed by the Kenya government affected the furniture business adversely and consequently created a black market for wood and forest products. The ban gave rise to illegal loggers who cut trees indiscriminately. Furniture making machines such as a splitter, planer machines, crosscut saw and T&G making equipment are commonly used within the vicinity of the roadside furniture manufacturers.

2.6.2. Wood pallets

Pallets are flat structures that are used in cargo container ships for supporting goods while in transit. Cargo consignments are placed on pallets and therefore the process of piling them is referred as palletizing. Palletizing eases the process of handling and storage of cargo on

ships as well as when offloading by use of other equipment such as folk-lifts. Cargo placed on pallets is secured with ratchets, straps or wraps for stability and to prevent unwanted movements. Wooden pallets are therefore mostly discarded after their main use is fulfilled. However, wooden pallets can be recycled into useful products with a little thought and creativity. They can be dismantled and repurposed into a variety of furniture pieces and other functional products such as attractive home décor pieces.

2.6.2.1 Repurposing of wood pallets

A variety of items can be made from wood pallets boards because they are versatile. Items that can be made using pallets include chairs, tables, benches, shelves, beds, and shoe racks to mention a few. Pallets are gaining prominence in use owing to how cost effective they are and therefore they are economical to use. Additionally, wood pallets are readily available and are disposed by most importers as waste. They are easy to transport because they have regular shapes and can be stacked on a pick-up trucks that are readily available to offer transport services in Kenya. The quantities sought can influence the price that the pallets can be sold for because haggling is a normal practice also depending on where you buy.

There are some successful pallet furniture manufacturers in Kenya such as La Pallete[11] which is a family oriented business founded in 2014. La Pallete manufactures furniture and decor pieces on custom orders from recycled wooden pallets at their backyard in Nanyuki, Laikipia County. They sell as far as to the up market Nairobi market mainly in Karen that is about 250 kilometers away. Most of their products are hand made and therefore each unit has a unique rustic look. They have an active social media platform where they promote their products.

2.6.2.2 Uses of recycled pallets

Increased use of pallets have seen rise of new kind of furniture such as office and shop display shelving. They have also gained significant use at social events as a unique form of seating. Hawkers use pallets temporarily (on a daily basis) as display furniture stands for their merchandise because they are more affordable. Informal furniture manufacturers in Kenya use wood from pallets for framing the structure of furniture before upholstering. They argue that no one can tell what kind of wood the internal aspects contains thus it is not unusual to find jointed pallet wood in use. Pallet wood is therefore used in the framing structure for sofa sets, footrest porches and restaurant lounge seats to mention just a few.

2.6.2.3 Some challenges in recycling wood pallets in Kenya

Use of wood pallets can also be challenging because they are prone to insect and pests invasion such as cockroaches and termites. This can be taken care of through fumigation before use. Saw dust chips can easily flake off pallet leg stands and consequently create nuisance in terms of dust. However fixing wheels to the pallets can mitigate this. Additionally, pallet furniture can be prone to molding if the environment is dump especially if they are made of compressed soft board and chipboards. Some wood pallets can be contaminated with chemicals depending on what was shipped on them and therefore they can be unsuitable to be used in furniture making unless traceability is diligently done.

[11] Le Pallete. (2014, 12 15). Retrieved 09 20, 2017, from http://www.lapalettedecor.com/about.html

2.6.3. Input Challenges in furniture manufacture

The furniture manufacturing industry has been hit by uncertainty with regards to input supply (wood), thus hindering firms from not investing in upgraded technology, up scaling the manufacturing facilities or engaging their employees with skills upgrades (MIED, 2015).

Whereas there is demand of furniture, manufacturers have neither adequately invested in production facilities that can enable scaling up nor taken advantage of other parts of the supply-chain to enable mass production. This has led to piece-by-piece production, hindered by state-of-the-art equipment or training systems. Field survey data provided by MIED (2015) indicates that the formal furniture manufacturing sector make a profit margin of up to 25 percent.

2.6.4 The furniture manufacturing strategies

Some manufacturers incur high operational costs despite operating at a fixed furniture price. There are few firms that specialize; the norm is that they produce a variety of furniture with a varied price, quality, and style range (MIED, 2015).

The informal furniture sector can be highly fragmented. The enterprises operate individually and compete against each other as observed along Ngong Road. This can result in below optimal productivity. They are additionally characterized by prominent use of manual tools and equipment. Other challenges faced by informal furniture manufacturers include low levels of automation, compounded by poor and erratic access to electricity supply. These factors have a negative effect on the production capacity, the quality as well as the range and competitiveness of their products. Lack of formal has left aspiring artisans to depend on informal apprenticeships for skills acquisition.

Table 3: Characteristics of the informal furniture-manufacturing sector

Strategy	Small margins, low volumes, low operational costs, operate on a non-fixed price basis with some room for negotiation
Distribution	Sell directly to customers; Premises located by the roadside near residential areas that facilitate access to target markets; Exhibition centers and open air retail centers countrywide, located in densely populated areas
Furniture type	Wide range of products, though style and finishing limited by available tools.

Source: Creapo 2015

Locally manufactured furniture is not as cost competitive as imported furniture.
Data collected by The Ministry of Industrialization and Enterprise development (2015) indicates that Kenyan products incur very high production costs and are therefore only competitive in local and regional markets. Additionally, this can only suffice after import duty of 25 percent and handling costs are factored in. Conversely, labour and machine time is cheaper because most machines are old and not optimally used. Use of cheap unskilled labour can likely reflect on less developed managerial skills and higher business transactions costs (MIED, 2014).

2.6.5 Key Constraints Facing the Industry

There are notable factors that hinder the growth of the furniture manufacturing industry;

1. Suppressed supply of inputs raises the cost and lowers the quality of furniture manufacturing.

2. Inadequate skills and ill-equipped production facilities can results in below optimal productivity and lower quality products.

3. Decreasing market due to quality issues leading to difficulty in defend market share uptake by imports.

4. Limited industry organization (communication, coordination and collaboration) undermines the potential of the furniture sector.

2.6.6 Constrained Input Supply

Reduced supply of inputs especially wood, increase the cost and lower the quality of furniture manufacturing (MIED, 2015). Domestic timber supplies are not sufficient to meet the demand yet there lacks a reliable source of information on local timber supply and demand. This can undermine any long-term sustainability of the wooden furniture industry. Adequate data would form a basis for informed decisions about commercial reforestation. Stakeholders would plan in advance in consideration of the timber options and the available sources.

2.6.7 Ambiguous timber importation uncertainty, as it requires KFS import licenses.

Instruments such as licenses give the government a way of controlling and monitoring import volumes in an ideal environment. However in an environment of scarcity of inputs such instruments can make the process of importing timber costly and complicated due to bottlenecks and ambiguity. This can restrict the quantity of raw wood available to manufacturers. Moreover, there can be potential conflicts of interest within Kenya Forest Services because part of their revenue comes from the production and sale of timber. Notably, if there were no import restrictions wood could be imported freely and consequently the local price of timber could fall thus affecting government revenue (KFS, 2014).

2.6.8 Limited Skills and Poor Production Facilities

Insufficient investments in furniture manufacturing can result in low levels of productivity. The formal and informal furniture sectors are hampered by both inefficient and outdated production facilities - some of the facilities have limited operations and maintenance programs for their equipment (MIED, 2015). It can be difficult to find prospective employees with relevant skills and therefore the majority of training may take place haphazardly on the job. Formal firms estimate that an employee can take about two years apprenticeship training to acquire sufficient skills and competences in production. This skills gap **c**an be compounded by the lack of investment in ongoing training. The furniture sector is a skill and knowledge intensive industry and therefore the skills gap can market-driven. High quality training can improve the competitiveness of the furniture value chain (MIED, 2015). Lack of subsidized or paid training available for *the* informal furniture manufacturers can be a factor that limits the quality, sophistication and design of the furniture they produce. The private sector and the government can through Private Public Partnerships establish institutions that train in the production of furniture because such skills are required. The closest programs offer carpentry, joinery and timber technology.

2.6.9 Limited collaboration, communication and coordination

The furniture manufacturing industry is challenged in that relevant data is currently not well

organized. The industry can benefit if there is a coordinating body that is a custodian of sector interests as well as promotion of best practices. The custodian body can share best practices as well as steer the industry towards investing in necessary resources thus helping in responding market changes.

2.7.0 Section Summary

The main observation is that manufacturing costs are not only higher than those in competitor countries where Kenya imports from but in machine time and labor.

Furniture industry performance faced by four key constraints:

- Constrained input supply, which raises the cost and lowers the quality of furniture manufacturing
- Limited skills and poor production facilities that result in suboptimal productivity
- Lower quality products; decreased access to markets, which makes it difficult to defend market share vis-à-vis imports; and
- limited industry communication, coordination and collaboration, which undermines the potential of the furniture sector (World Bank, 2014)

2.8.0 Handling and assessing used furniture

Used furniture pieces can be excessively worn out, such as old dressers or rickety heirloom chairs yet some could look as good as new. The main objective for anyone engaging in such a business would be to sell the furniture as fast as possible for volume sales. In the instance where the pieces available are worn out, there can be need to repair on site to reduce further damage should the furniture be moved around the showroom, or at the storage facility. Older mass-produced pieces of furniture that could have been between 1850 and 1960 can make a good selection for upcycling. This is because most mass produced furniture units do not fetch high value as antiques but for a few exceptions. However, most such pieces are solidly constructed and can be used for many more years. Some furniture units should not be up-cycled because they can depreciate in value - the basic rule of thumb is: if the piece was manufactured before 1850, some background research can be done to establish if it can be conserved rather than restored. This means that the furniture can be considered for preservation and stabilization “as is”.

2.8.1 Upcycling furniture

Despite some furniture pieces being recently manufactured compared to others, prominent makers such as those from the Art Deco and Arts and Crafts periods can command high prices. Therefore, their furniture should be preserved without intervention. Further consultation regarding the age of furniture or the manufacturer can be considered if the furniture assessor suspects that there could be something unusual or distinctively well constructed about the piece. Most experienced furniture assessors recommend following your gut feeling and they recommend that if in doubt, the assessor can always consult further.

2.8.2 Assessing old furniture

While sorting out used furniture, it is recommended to have a keen eye to detail. This can be useful especially on some key elements that could increase chances of retrieving furniture that does not need further intervention through up-cycling. As mentioned, some pieces can sell “as it” due to the monetary value they can attract in their current state. Some furniture dealers could have general guidelines that can help in assessing the age and quality of furniture. Notably, there can be a lot of exceptions and therefore caution should be exercised.

2.8.3 Indicators of the age of furniture - Dovetail joints

The construction details of any piece of furniture can give a rough idea on the age and quality of craftsmanship. Woodwork projects undertaken using dovetail joints are strong and require polished skill to produce. Therefore, most furniture pieces that have dovetail joints can be a sign of master craftsmanship. Most American-made furniture age can be determined by observing hand-cut dovetails. Such pieces can be estimated to date before 1890, although hobbyists and specialty makers still use dovetail joints in recent times. "There's no hard and fast rule, but hand dovetailing was really no longer done in factories after that date," Masaschi[12] says. The obvious characteristic of hand dovetail joint is that they are slightly irregular - with thin pins and are tapered. The introduction of mass production led to wider, uniform machine-cut dovetails that were prevalent in factory-made furniture units from 1890 until the modern era. A furniture piece that does not have dovetails can still be a candidate for upcycling. This decision can be reached if the piece is sturdy and well-designed, but it's not likely to be an old piece with antique value. Solid wood or plywood backing can always be an indication of genuine vintage furniture pieces.

2.8.4 How and where to look for age of furniture indicators

Another tip includes looking at the backside of your furniture catch. This includes the insides and backside of drawers where possible. Most solid wood backing can indicate that the furniture is likely to have been manufactured before or during 1880s. Notably the invention of plywood came into light around the turn of the 20th century. However, the presence chipboard in furniture can indicate that the furniture was made post 1960. This is the era whereby most manufacturers started compromising on the wood quality through various wood processing innovations, thus "cutting corners,"

2.8.5 Inscriptions or manufacturer's stamps

While sorting furniture, it can be worthy for the assessor to identify any marking that can indicate the origin. Early pieces of furniture that were handcrafted can sometimes have an inscription from a specific master furniture maker. This can be a leading clue towards its value and therefore a professional appraiser should examine it further. It is not unusual to find simple pencil signatures on really old furniture - it could be just a pencil signature on the inside of a drawer. Additionally, at the turn of the 20th century furniture makers adapted the use of paper labels. The use of paper labels gradually progressed into brass plaques mounted onto the insides of drawers or at the back furniture pieces. However, the use brass plaque labels changed in the 1950s and 1960s and they were replaced by the use of spray-on stencil. If a piece of furniture was initially made as a pair it could only have markings on either of the pieces but hardly on both. This can create some uncertainty if the assessor handles the unmarked piece.

Industrially Mass-produced furniture pieces from the turn of the 20th century on can have a label from the manufacturer, such as "Larkin Soap Co." or "Cadillac Cabinet Company." The information on such a label can provide some rich piece of history. It can also be used to assess how common the piece of furniture can be. This can be crucial information in determining if the furniture can be up-cycled or if it can remain as it is. Mass-produced pieces of furniture up until the 1950s and 1960s can make a good selection for upcycling.

2.8.6 Original hardware and other details

While assessing used furniture, keenness can be emphasized on the kind of hardware installed. The assessor can try to establish if the hardware is original – this entails

[12] Retrieved 08 09, 2017, from http://www.terimasaschi.com/index.html

investigating if the fixture is authentic or not. The style of the hardware can also be assessed for uniqueness; whether the hardware is solid cast-brass or wooden pulls can mean the furniture is likely old. A collectibles reference guide can be used to identify the style and age range. Common style examples are Chippendale, Hepplewhite, Sheraton and Federal.

Besides the indicators mentioned, a proper reference from guidebooks should be insisted upon. This can entail for example studying marble-top dressers and beds with huge headboards and footrests that are almost exclusively from the Victorian era (late 1800s). These pieces of furniture have ornate details and can be upcycled with intrinsic care.

2.8.7 Piece on casters (wheels) is typically pre-1930s.

Wheels were used as fittings on furniture in furniture before the 1930s. While there can be temptation to upcycle all used furniture pieces that are available, clues on the age and history can be used in determining the most appropriate finishing the piece should take. This can be useful in researching on the hardware to be considered when sourcing for hardware to match the end result. Regardless of whether your piece has value as an antique, these clues to its age and history can help you research appropriate finishes and hardware before you dive into your project.

2.8.8 Tips in buying used furniture

Buying used furniture can be an overwhelming task to some people. It is always advised that you should the best you can afford because better quality is a better investment that will last.

Good craftsmanship matters – It can be useful to pull out drawers and examine the joints for tightness. Look for cracks, bubbles or discoloration in wood finishes. Squeeze the arms of upholstered furniture to feel for adequate padding. Look at the stitching carefully and look for frays or overly taut areas. Don't be afraid to put the piece on its side to examine the bottom (Seo, 2001).

An antique piece can have major flaws; if the wood is rotting in places, it isn't a good buy. A white towel can be carried along to the flea markets or antique stores, then discreetly rub it across the surface of wood piece to see if any brown smudges come up. If so, the piece may have been covered with shoe polish to temporarily hide damage (Seo, 2001). That doesn't mean the piece is necessarily bad, but be aware of any defects before you buy.

Most buyers do not believe in buying a sofa with the intention of replacing it in a few years. Cheap sofas may look good for a year or so, but inexpensive fabric quickly pulls, cushions start to feel uneven, and springs can lose their tension. A good sofa can have a higher price tag but you may never regret many years after. Additionally, a day will come when kids, cats, guests and life in general can take their toll - fabric will be torn, stains will appear and padding will get compacted. Such a piece can be re-upholstered.

Re-upholsterers can do more than replace the fabric. They can change the shape by removing or adding padding, replace synthetic materials with natural ones, and let you create a new decorating scheme based on what fabric you choose. Reupholstering furniture can include:

The new owner supplying their own fabric – this can give a choice in the use of eco-friendly fabrics like organic cotton or hemp. The upholsterer can give the recommended size of fabric to be ordered. A choice of fabric can be made – this means all-cotton padding can be preferred to synthetic padding. The cotton can be sourced sustainably with ethical concerns.

Some of the secondhand furniture can be traced from plantation wood lots. This information can be found on the labels. The benefit of such furniture manufactured from plantation wood is that during the growth phase the young trees reduce carbon dioxide and therefore mitigate climate change. Besides plantation grown wood furniture, purchasing furniture made of reclaimed timber can make an alternative. Reclaimed furniture manufacturers source wood planks from farmhouses, broken tables and abandoned warehouses (Seo, 2001). Some of the wood can be very old, with rich colour, warmth and charm, perfect for making barn furniture. Some manufacturers opt for naturally aged wood with knots, nicks and charming flaws. Such wood is repurposed through milling into other functional pieces of furniture.

Owning vintage furniture can be a sustainable way of preserving the environment (Seo, 2001). It can be a way of embracing the circular economy. Antique furniture does not necessarily have to be centuries old with sky-high price tags. Vintage wood furniture can range from early 20th Century Arts and Craft movement to utilitarian pieces dating in the 1970's. Vintage pieces are appealing because the aged finish and exposed construction details can have a historical charm.

2.8.8.1 Tips in simple restoration

Fixing small dents

If the wood furniture has small dents in it, the dent can be repaired by place a few layers of cloth over the dent and running a hot iron over it. The heat will make the dents swell back into their original position. This can restore the wood to its original richness.

Natural furniture polish

Salad dressing staples can help keep wood furniture looking well cared for by mixing one of cup olive oil with half cup of lemon juice. The concoction can be whisked until the mixture is emulsified. This can be applied using a recycled spray bottle.

The current trends are inclined towards what pairs chic, simple style with eco-friendly materials.

2.8.8.2 What to buy

Try to buy products that are made from recycled (and recyclable) materials. However, recycling for commercial purposes can be worthless if consumers do not purchase items made from recycled materials. There is need for awareness creation on the importance of using recycled materials.

It can be prudent to pick out sturdy products over recycled products if the products are made to last – It should not only be about the hogwash. Long lasting products prevents material extraction (Seo, 2001).

Creativity can be applied in the use of eco-friendly materials in an exciting way. For example, small patches of fabric for example worn jeans can be used to upholster make footrest furniture.

2.9.0 The importance of Case study at OMRIN Estafette

OMRIN Estafette is important for this research because they have an innovative way of embracing the circular economy by recycling used furniture through their thrift shops. This forms a useful benchmark for this research with regard to the innovative way in which wood is brought back into use as furniture especially from discarded construction site wood. Such

a model can be replicated by emulating how Estafette partakes in environmental management on how they handle used furniture. Besides being an important source of knowledge, Estafette can also be a source of used furniture for import to Kenya. OMRIN is amongst the leading companies in Netherlands that has embraced the circular economy in sealing the loop, recycling as much raw materials as possible and producing renewable energy as well. They are part of a network in different product chains in material recovery. The name 'Omrin', is Frisian for 'Circuit'.

OMRIN is a company owned by 25 municipalities in the province of Friesland serving 250,000 households through a long-term contract for waste collection and management with these municipalities. They have 7 thrift stores in the region of Friesland run under Estafette. All their thrift stores sell used furniture. Estafette accesses the furniture through different ways:

1. People deliver the used furniture to either of the stores.
2. OMRIN is called to collect the furniture at their house for free.
3. OMRIN also has agreements with a variety of companies like housing associations or notary offices, who provide the services of emptying a house in the case of death (and there is no family who can do this or any other person on the lineage to inherit the furniture).

Once the furniture is received, it is inspected for quality and grading. If the furniture is approved as sellable, it goes into the store showroom immediately for resale. However, if the furniture is worn out or of poor quality, it is moved into the repair workshop where it is considered for salvaging. This is done at very low costs and minimum effort possible. Additionally, OMRIN has a 'pimp' department in their stores both in Leeuwarden and Sint Annaparochie. The “pimp” department selects furniture (that is not really hip or that does not sell as fast) from the showroom and recalls it to their workshop. They administer treatment such as distressing and painting through various hippy techniques. The furniture is taken back to the showroom for resale thereafter. Such furniture can sell really fast, usually because it normally has some artistic touch. A carpentry workshop is also part of their operations where they manufacture garden furniture using barn wood and used pallets and recycled wood especially that was previously used in construction sites. If the furniture is completely broken, it is moved to the local waste-recycling center for energy recovery as a last resort.

Chapter 3: Research Methodology

Research design is defined as a strategy to answer research questions or to test research hypothesis (Pollit et al., 2001). This chapter describes several planned activities to help provide answers to the research questions that can form a basis of founding a social enterprise. The activities were planned in order to elaborate on the feasibility of creating a used furniture business enterprise that incorporates a product development department centre that can be training, repairing and up-cycling furniture through value addition. The contents of this chapter entail the research framework, research questions, concepts definition, the research strategy, research materials and assessing methods in forming a basis for establishing a social enterprise that can source and up-cycle used furniture.

3.1 Research framework

Verschuren and Doorewaard (2010) defined a research framework[13] as the schematic presentation of the research objective. It includes a seven step-by-step activity to achieve the research objective.

Step 1: Characterizing briefly the objective of the research project

The objective of this research was to form a basis for creating a used furniture business enterprise that can incorporate a product development hub that will be repairing and up-cycling furniture through value addition in the recovery of wood. The centre can also be used as a platform for training and capacity building besides repurposing other products to avoid equipment downtime.

Step 2: Determining the research object

Verschuren and Doorewaard (2010) define research object as the phenomenon under study. The objects of study are used furniture, and furniture up-cycling and social entrepreneurship in the context of the circular economy.

Step 3: Establishing the nature of research perspective

Research perspective refers to the 'spotlight' or 'lenses' that can be used to study the research object closely (Verschuren and Doorewaard, 2010). The research narrows down to the benefits of re-using furniture as a measure in wood recovery and the ripple effect of other opportunities that can arise in an enterprise that trades in used furniture. The processes of furniture recovery are explicitly discussed through a case study at OMRIN Estafette - Furniture up-cycling through a product design hub as a value added benefit as indicated in figure 1.

Step 4: Determining the sources of the research perspective

The research used a business model as indicated in figure 2. to interconnect the proposed key components of the used furniture business enterprise.

13 Theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study.

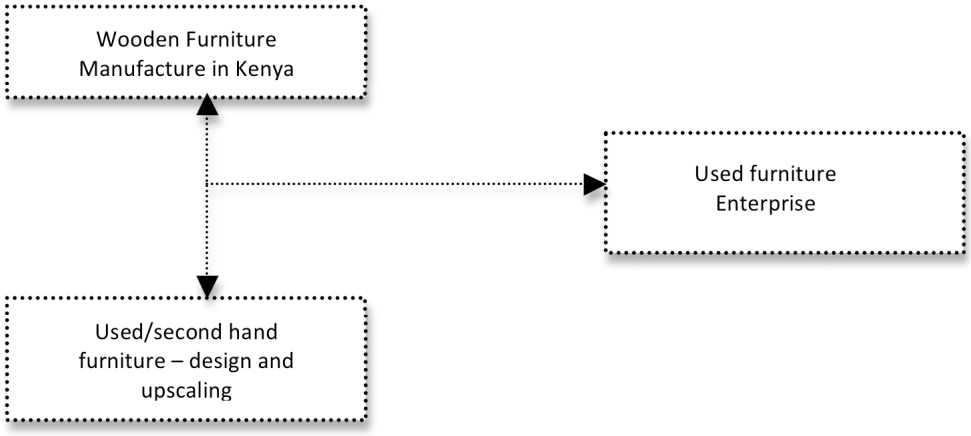

Figure 1: Confrontation of research objective and research perspective

Step 5: Making a schematic presentation of the business model research framework

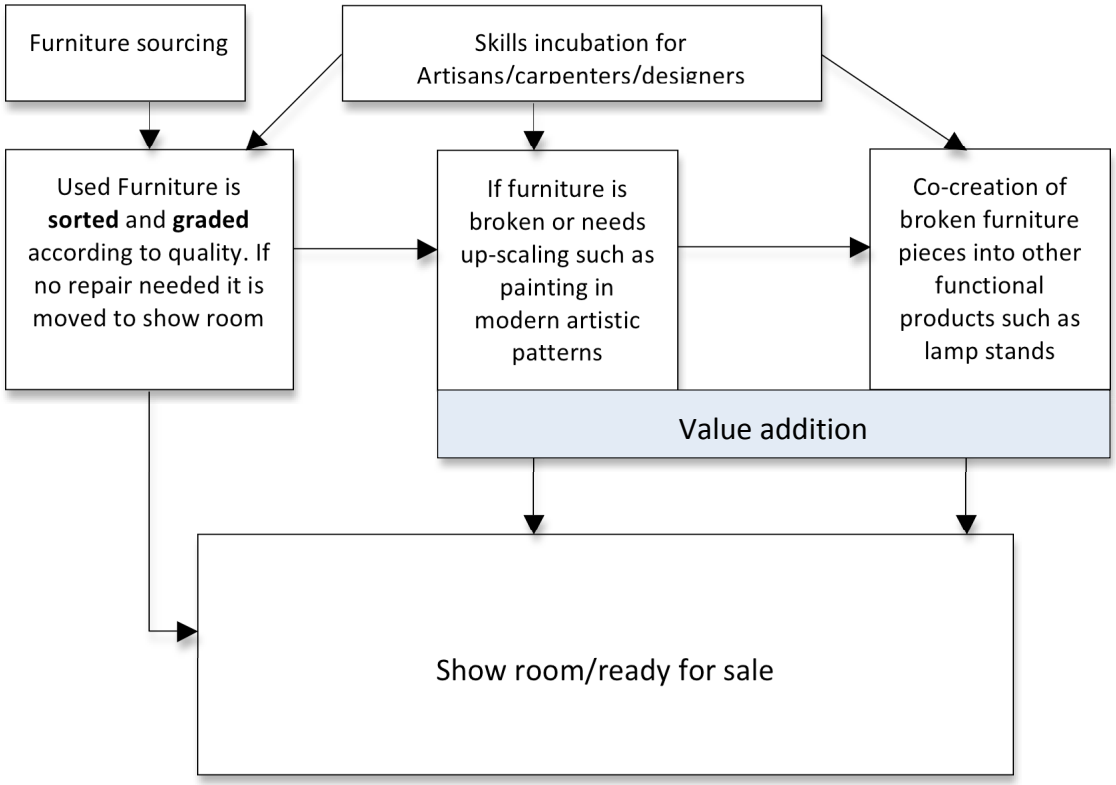

Figure2: Business model outlining key components of the proposed enterprise

Step 6: Formulating the research framework in the form of arguments which are elaborated

a) This section refers to the sources from which the research perspectives were developed. It entails the study of concepts such as innovation, absolescence, sustainability, circular economy and social entrepreneurship. This indicates to which research objects the research perspective was applied. The three research objects (used furniture, furniture up-cycling and product co-creation from waste wood) were researched using desk research and a case study.
b) The section indicates how each research object is interrelated by confronting the result of the analysis as the basis for a second hand furniture social enterprise.
c) The research objective was aimed at forming a basis for founding a social enterprise that can source used furniture in Kenya and abroad so that wood deficits can be bridged. The social enterprise can incorporate furniture repairs, up-cycling and a co-creation centre under one umbrella.

3.2 RESEARCH STRATEGY and Data collection tools

The study used desk research and a case study to exploit the different information sources available to validate the information collected along the execution of this research. Primary and secondary data source was used. To collect primary data, some interviews were conducted. Observations that gave insights to some specific situations were used during the case study.

Desk research - This involved reviewing existing peer reviewed literature using academic journals as well as official reports from relevant government ministries and international development agencies will be used. Electronic sources were used be consulted as a form of information from DIY sites, online second hand merchants and online magazines.

Case study - A case study is a research strategy that entails gaining indepth insights about one or more several objects or processes that are confined in time and space. A detailed observation on location with an aim of gaining a profound insight into the way various processes take place, and the reason they develop as they do. The case study was conducted at OMRIN Estafette. Open observations on site were made as well as intensive data collection through hands on participation in wood recovery processes. This was undertaken at the pimp and carpentry studios that support the second hand furniture sales section.

Interview - Primary data was collected through Key informants at OMRIN Estafette. This entailed acquiring three expert insights; First interview entailed verbal structured questions with the Communication Officer at Estafette. The aim of this interview was to gain an indepth understanding of how Estafette is organized, the operations, different departments and how the the circular economy concept is integrated in the social enterprise. The aim was to understand how furniture is absorbed and processed through their circular economy business model at the thrift shops spread across the Province Friesian.
The second interview was conducted with a furniture upcycling expert who distresses used furniture within Estafette. The aim was to understand how and what motivates furniture upcycling. The interview covered the basic requirements that would ensure a furniture distressing units is successful.

A wood repurposing expert was interviewed as the third expert. The interview with this expert involved two sessions because of the intensity of information sought. First there was the aim of understanding how they recycle wood and repurpose it into other useful items. Secondly there was need to understand what skills are required in wood repurposing and repair of furniture. It was also important to gather data on the rough estimates of resources (both basic tools and advanced tools) that can be required in setting up a successful wood re-purposing hub.

Imitation experiment – The research used an imitation experiment variant that did not have a comparable group. This entailed an imitation of the reality to be studied. Verschuren and Doorewaard (2010) presents imitation in the classification of an experiment athough they explicitly state that, 'strictly speaking imitation cannot be included in the definition of an experiment.' Wood recovery was the subject under study and the imitation entailed construction of a bee hive from discarded wood. The real time experience, the challenges and all notable occurences were recorded.

Research Unit

The units under this research study were:

Furniture up-cycling, used furniture and repurposing and recycling wood

Selection of Research Unit

A strategic sample was selected for analysis through a case study. Estafette is a foundation that is run by OMRIN. However, Estafette has various internal departments such as clothing, crockery, furniture, electronics, books, art, toys and equipment such as gym and camping gear. The study narrowed down to the proceses that entail used furniture recovery and resale.

Research Boundary

The research was limited to a case-study detailing wood recycling with a practical imitation experiment (a bee hive construction imitation experiment using recycled wood so that the goal of study could be achieved within the specific time. The following boundary was used the research: The research was conducted on one in-depth case study that focused on furniture up-cycling, distressing, reselling used furniture as well as use of recycled wood for furniture manufacture

3.3.0 Research Material and Accessing Method

Research material is the means of defining and operationalizing the key concepts of the research objective and the set research questions (RQs) (Verschuren and Doorewaard, 2010: 203). A practice-oriented research was conducted. This was because the objective was to intervene in timber scarcity for furniture production in Kenya by studying OMRIN Estafette as a case study. Omrin Estafette resells and up-cycles furniture, besides recycling and repurposing wood into new furniture and other functional items. The decision to use the case study was arrived at because of the need to get in-depth information about how OMRIN Estaffete sources, sorts and resells furniture through their thrift shops. The data

acquired can be used in forming a basis for solving a practical problem of timber deficits that limit furniture manufacture industry in Kenya. Participant observation was done with consent from technicians working at Estafette's carpentry and pimp studio, content analysis of contextual and audio-visual material was reviewed from online sources that were translated through assistance from the communication and marketing office. While there are several activities that happen at OMRIN Estaffete, the strategic sample of this research was focused on the whole chain, specifically on how they handle used furniture from acquisition to when a sale is made. Data was gathered about the skills required at the pimp and carpentry departments where wood recycling and furniture up-cycling was done respectively. This can be important when assessing the skills gap for a product development centre within a social enterprise that deals with used furniture.

The research questions (mentioned hereunder) to the situation in Kenya were assessed through desk research on previously written literature from government ministries/agencies, NGO's, foreign missions, academic institutions and investment briefings amongst others. The data and information required and its accessing method for this research was identified through a set of research sub-questions. These assessment methods are further elaborated in section 3.2. Hereunder, each research sub-questions is listed with the assessment methods and source of data that will be used.

RQ. Furniture in Kenya is made of either soft wood or hard wood sourced locally and in neighbouring countries.

To help answer this question, desk research study from documents and literature from The Kenya Forestry department, Chambers of commerce, Kenya Association of Manufacturers was assessed. Documents from The Kenya Bureau of statistics was also reviewed for relevant information. Online sources such as newspapers and journals were a rich source of information too.

RQ. Furniture is made from recycled wood such as wood pallets

To help answer this question, desk research study from documents and literature from books, magazines and design journals with subjects about material recovery and how re-use of recycled wood pallets are used in furniture manufacture. Online sources such as Do it Yourself (DIY) sites and blogs were reviewed.

RQ. The middle class prefer wood furniture

Electronic sources such online newspapers, magazines and government statistics were used as desk research study to gather data about this research sub-question. Home furnishing blog posts and trendy interior décor releases were reviewed for information. Literature from previous authors was referred to get insights as well. Blog posts that cover reality in middle class spending on home fitting will be reviewed. Opinions especially from designers and architects were sought from key informants to establish if wood is preferred.

RQ. The middleclass prefer unique furniture that is different from friends in their social circle as a status symbol.

Literature was studied to access information regarding what has been written about preferences in relation to the social circle one belongs. Documents such as previous surveys outcomes were reviewed. Social media pages that feature wooden antique furniture were reviewed. YouTube videos were also reviewed.

RQ. A furniture refurbishing and product development hub can create employment.
Literature review was conducted on the appropriate product development centers. Previous documents and conference presentations were assessed. The social media especially YouTube was used to review videos and short films from development organizations. Case study data collected at OMRIN where furniture was pimped and up-cycled was used to form a basis for employment creation. The personnel encountered at Estaffete (craft technicians, administrative, marketing) indicated that employment can be created at a product development hub.

RQ. A furniture refurbishing hub can be a platform to incubate trade skills and craft hobbies.
Literature review on furniture refurbishing was be analyzed. Desk research was conducted on how to incubate and nurture trade skills in furniture up-cycling. A case study conducted at Estafette's furniture workshop and pimp studios helped acquaint the research with hands on skills and an experience of what can be achieved in incubating trade skills. This entailed working under a qualified technician at Estafette. Interviews were conducted with key informants to determine what exactly it would entail to incubate trade skills and hobbies.

3.4 Data Analysis

Data analysis means data evaluation process through logical and analytical framework as presented in the following:

Method of Data Analysis
This research used qualitative methods for data analysis because the ultimate aim was to explore and understand how to set up a used furniture social enterprise as **observed in OMRIN Estafette thrift shop at Leeuwarden**. As such, this research **qualitatively analyzed the operations** at OMRI in with reference to the likelihood of replicating part of the operations in Kenya:

i) How do they handle furniture up-scaling through product design and
ii) How do they re-use wood and pallets for garden furniture manufacture
iii) How do they access and grade used furniture for direct placement into the showroom.
iv) What kind of machinery is required and what is the cost.
v) What kind of skills are required in the pimp and carpentry workshops

The qualitative data collected, being non-numerical will review images, videos, text and people's written or spoken words. The qualitative data will be gathered through reviews of video recording, magazines and website reviews as well as the organizations communication briefs.

3.5.0 Combination of elements and how it works in practice; type of innovation, goal and motivation,

This section discusses a combination of elements on how a social enterprise that sources and trades in used furniture can work in practice benchmarking with Estafette successful enterprise. The innovative processes of handling used furniture including furniture distressing and upcycling are outlined step by step as observed and experimented at Estafette. An innovative way of recycling wood into other functional products that can increase revenue streams for the enterprise is discussed. The goal of the case study was to have a feel, touch and experience the real life situation on site and gather as much pragmatic detail (for 2 months) that can be used for establishing a successful enterprise in Kenya. This happened when the researcher worked as a volunteer intern at Estafette. The researcher under supervision of the experts at Estafette did all the practical undertakings.

3.5.1 Case Study and field imitation experiment at Omrin Estafette

A case study research strategy was conducted in order to gain an in-depth insight about several objects and processes that were confined in time and space. The research entailed a case study at OMRIN Estafette. Open observations on site were be made as well as intensive data generation regarding the operations at the second hand furniture department.

3.5.2 Imitation experiment:

The research used an imitation variant of an experiment by imitating the reality of activities that involve recycled wood, repurposing used furniture and furniture up-cycling. The imitations involved making something happen (X) and examination of the effect (Y) of the intervention. The observation was focused on how practical (or impractical) it can be to use recycled wood in the manufacture of a bee hive (see appendix 2 figure .

A case study was conducted at OMRIN Estafette that incorporated two imitation experiments with the objective of gathering intricate details on how the operations of a social enterprise that would source, sort repair and resell used furniture can be organized and operated. The experiments were undertaken at two workshops; the up-cycle and pimp workshop/studio and at the carpentry workshop. The experiment at the carpentry workshop was focused on wood recovery and reuse - how wood from discarded furniture and construction sites can be repurposed to new products. The pimp workshop imitation experiment explored techniques of distressing used furniture with the aim of improving the aesthetic appearance, aging as well as restyling. There are various techniques used with consumer preferences in mind. The main objective of distressing used furniture was to make them attractive and thereafter increase sales. The researcher with several objectives conducted these experiments beforehand as outlined hereunder;

- To assess if a social enterprise in Kenya can partly adopt part of the model used by Omrin Estafette
- To have the hands-on experience in using hand tools and record lessons learned
- To document the workshop procedures hands on while undertaking the experiment
- To interact with the workshop professionals as they engaged in their daily activities and seek expert opinion
- To observe and record the skills sets for capacity building

The process was outlined as listed hereunder.

3.6.0 Imitation Experiment 1: Up-cycling two stools at the pimp workshop.

The objective of the experiment at the pimp and up-cycling was to establish what skills are required, how it can be done in practice and what it entails while forming a basis of establishing a social enterprise that can source and resell used furniture. Therefore, the operations of the pimp workshop are discussed. The workshop up-cycles furniture that could previously take longer to sell (X) from the showroom or those that can require some up-cycling (Y) to make it more attractive. Additionally, some furniture is distress at free will as routine practice of new skills or for experimentation purposes. Some of the furniture can take longer to sell and therefore a decision is made to select the furniture for up-cycling. The up-cycling can entail repurposing such as converting a vintage sewing machine parts to a coffee table, sanding a previously painted piece of furniture thus giving it an vintage look or applying aged-looking techniques to enable the furniture to sell faster. Some projects are undertaken jointly with the carpentry workshop.

3.6.1 Kick-off meeting:

Consent was sought on whether it was in order to record the meetings and use the names of the attendants.

A volunteer at the upcycling workshop, conducted an introduction of what is undertaken at the workshop. The meeting entailed a brief introduction on the layout of the workshop and how to access various tools and relevant instruments. The briefing lasted one hour and thereafter other volunteers who work at the workshop were introduced.

An outline of the activities to be conducted at the workshop was discussed as outlined herein. This entailed:

- Safety and precautions
- Tools that can be used
- Paints and other ingredients
- Where and how to identify furniture within the premises
- Various techniques that can be used including: Chippy layered paint finish, various distressing techniques such as: using faux finish, sanding, glazing, stenciling
- Finishing touches in readiness for display for sale in the showroom

3.6.2 Safety and precautions

The pimp and up-cycling workshop can have ingredients that can be flammable especially paint removal ingredients. Paint at the up-cycling workshop is primarily applied with brushes and rollers. The surface being painted can be the main hazard when painting. Paint can splash and reach the eye thus causing injuries through irritation. The act of painting can expose the painter to potentially dangerous chemicals that can be damaging to health. Besides, some hazardous components in paint coatings and solvents can enter the body in various ways. The painter or any other person in the workshop can inhale chemical vapours either from spraying, by absorbing through skin contact or by injecting with high-pressure spray painting equipment where mass up-cycling is undertaken.

Proper ventilation is critical when working with paint. Vanish or scrapped paint from used furniture can contain flammable substances and can be a fire hazard. A nose mask should be used when using a sander to avoid inhaling fine dust and paint components that can result

from the sanding tasks. A detailed guide of paint workshop safety hazards associated with painting is attached in Appendix 2.

3.6.3 Tools and accessories used in the pimp workshop

The tools and accessories required include; the piece of furniture to be distressed, base coat such as satin latex. Top coat such as latex paint or a wood stain can be used. Painting tools such as brushes and rollers, candle wax, medium-grade steel wool. Sand paper and tack-cloth polyurethane are useful during finishing. Steel wool, screwdriver and a spanner were used too. These items were available at the studio and all new supplies were fairly priced and therefore the material input costs were minimum.

3.6.4 Where and how to identify furniture for upcycling within the premises

A brief introduction on where to source the furniture for up-cycling was done. The furniture was available at the premises although at a different department. This involved an elaboration on what detail to identify on interesting pieces. The task also involved going to the used furniture receiving section to source for up-cycling pieces. The receiving section is where all furniture is delivered by individuals or by the Omrin's patrol truck that collects discarded furniture within the municipalities. The OMRIN can collect it from specific residences at a fee should they be contracted to do so.

3.6.5 Identifying what to upcycle

A small stool and a chest of drawers were identified as suitable samples for up-cycling for the experiment (see appendix 2 figure 6). On consultation with the workshop assistants, It was learned that the pieces had overstayed in the showroom in their current state. They were selling for 20 Euros and 40 Euros respectively. The selection was made based on the limited time available for very intense work and the fact that the tasks would give sufficient representation of what it takes to up-cyle furniture depending on the techniques used. Both pieces did not have any colour but a clear coat of varnish that was worn out.

The process:

1. A brief discussion ensued regarding the kind of techniques that would be applied to the two pieces. The stool would be painted with a base colour and thin brush strokes would be applied to give the desired effect. The chest of drawers would have a base luminous colour and a sanding technique would be applied to achieve the desired effect.

2. Hardware was removed from the chest drawer. For this experiment, the hardware was the drawer knobs. The tools required were a spanner and a screwdriver.

3. Both pieces were sanded lightly because they had some previously applied vanish finishing coat. Once the sanding was done, a clean fluffy piece (a towel is applicable too) was used to wipe out loose sanding dust. The sanding was done by hand although it could be done using a power tool such as an orbit sander.

4. A base coat was applied on both units. Light blue was applied for the stool while luminous yellow was applied for the chest of drawer set. After this step, the pieces were given different attention for individual character.

5. Once the base coat on the stool was dry, a mixture of paint was done to achieve some indigo colour that was thinly stroked on the stool giving it some varied look due to different paint exposure on the base coat (see Appendix 2 fig 6).

The intended final output of the chest drawer was a rustic aged look. Therefore, when the base coat was dry, a layer of blue was applied indiscriminately on the piece and most prominently on the edges of the piece. Once the piece was dry sanding was done on areas that would naturally end up distressed. These are places where the furniture can be bruised by walls such as corners that get easily nicked. A scrapper was used to scrap off paint on the sides to give it a vintage look.

6. The workshop technician offered a word of caution regarding overdoing either the sanding or scrapping. He stated that temptations to get excited with the sanding task could occur. Therefore, it can be advisable to stop and wipe the entire piece with the tack cloth, and take a break before assessing the outcome. Wax was applied on the base coat and then an additional layer of paint was used to cover areas that needed further distressing using a steel wool - when steel wool is rubbed over the waxed areas, the other layers are not affected but an astonishing output can be achieved. Once the rubbing with steel wool was completed, the piece was wiped with the tack cloth to see the outcome.

7. A clear vanish coat was applied for both pieces.

8. The hardware was restored on the chest of drawers

9. A price was determined: the stool set would sell for 65 Euros and the chest of drawers would sell for 120 Euros.

10. A label “P” with the price was installed. “P” indicates that the furniture had gone through the pimp workshop (see Appendix 2 figure 5).

3.7.0 Imitation Experiment at the carpentry workshop - Kick-off meeting

Permission was sought on whether the kick off meeting could be recorded. The permission was granted. The kickoff meeting entailed a discussion with the assigned woodwork and prototyping expert. An intense discussion about the prospects of establishing a used furniture business in Kenya ensued with the carpentry expert expressing interests in understanding the local circumstances that was discussed. A brief description of Kenya was made with specific subjects on how useful a social enterprise that can upscale furniture can help in creating employment and skills transfer. It was apparent that the expert was knowledgeable in the circular economy concept and the importance of sealing the loop in avoiding waste.

3.7.1. Guidance on where to source and scavenge for scrap wood

After deciding on the kind of bee-hive that would be constructed, the next step was to source wood at the “dumped wood section”. This is the section where any discarded wooden items (pallets, discarded furniture from the showroom, rejected furniture at sorting and broken wood) are dumped for onward forwarding to the energy recovery facility (See appendix 2 figure 10).

3.7.2 Workshop Tools

This section is broken down into three parts. The first sub-section discusses the common-sense safety rules as they apply to all or a majority of the machines in the workshop. The second sub-section will consider the use of tools in the field. The third part deals with safety issues in the workshop.

Workshop safety - Common-Sense Safety In the workshop

Movement in the workshop must be considered. When entering the shop each morning or after being away for an extended period of time, it is recommended to check around to see if the arrangement of the shop has been changed. This will help in predicting and avoiding accidents caused by bumping into objects that may have been shifted. When moving within the workshop, area where a co-worker can be operating a machine should be avoided. If it is not possible, a lot of caution should be taken - the user of the machine should be alerted by addressing them when they are pausing, not working with a machine.

Using hand tools: It was communicated that haste and forgetfulness in the workshop area can create unnecessary risks: for example for example not checking the track of the table saw, hitting or stepping on a scrap of wood, and having the wood hit the user. Some safety tips were discussed and are listed as:-

3.7.3 An intensive introduction to hand tools:

The most crucial aspect in selecting tools, as outlined by the expert, was that he was always concerned with having tools that can allow him to work efficiently with rough-cut or reclaimed wood. This is because use of recycled wood saves money on materials. This reinforces the notion that purchasing many board feet of smooth, dimensioned stock at full price can be a fairly quick way of running out of money, especially for a startup. Wood working hand tools are important for all beginners and therefore all beginners must learn how to use hand tools before they advance to power tools (see appendix 2 figure 10). This is because hand tools form a basis for nurturing all wood working skills. Hand tools can be slow to work with especially when the work is repetitive for mass production. The “must” have hand tools recommended are:

- The work surface should be an sturdy work-bench if possible and should be the first consideration.
- Combination square, Sliding bevel, Marking gauge, Framing square, Steel tape (10' or 12'), Folding rule, Compass, Scratch awl, Crosscut saw (12 pt.), Rip saw (6 1⁄2 or 7 1⁄2 pt.), Backsaw or dovetail saw (15 tpi), Coping saw, Hacksaw, Slip-joint pliers
- Needle-nose pliers, Diagonal cutters, Smooth plane, Low-angle block plane, Wood chisels (1⁄4 ", 1⁄2 ", 3⁄4 ", 1"), Single-cut mill bastard file, Round rasp, Flat rasp
- Cabinet scraper and hand scrapers, Utility knife, Claw hammer, Finish hammer, Nail set, Wooden mallet, Screwdrivers (straight, Phillips), Doweling jig, Bench vise or clamping system, Bar or pipe clamps (2-3' and 2-5' min.)
- Hand screws, C-clamps, Face shield or safety glasses, Hearing protector, Dust mask or respirator, Sharpening stone (dual-purpose, coarse/fine), Router (1 hp, 1⁄4 " collet), Circular saw (7 1/4"), Drill (3/8" variable speed), Twist drills (1⁄16 -3⁄8 "), Spade-shaped drill bits, Brad-point drill bits
- Jigsaw, Dual-action pad sander (straight-line and orbital), Belt sander (3X21" with dust collection)

3.7.4 Using power tools:

An introduction was conducted with a briefing regarding the use of power tools. It was stated that it was mandatory to unplug power tools when cleaning to avoid disasters such as electric shock. Obviously, there are many other hazardous situations that could possibly occur; hence, this section will present a comprehensive view of safely operating the specific machines in the workshop.

Power tools can be convenient while up cycling and recycling wood. They can also be vital while repairing, upholstering used furniture because most of the tools are versatile. They can increase the output through speed and efficiency. However, power tools can be dangerous and extra care should be taken while handling.

3.8.0 Imitation experiment 2 – Construction of the beehive from recycled wood

The objective of this section is to help understand the intricate details that can entail recycling and repurposing used furniture. The researcher undertook the tasks under supervision of the carpentry and prototyping workshop. The opportunity to undertake the hands on exercises was presented as one of Estafette's objective of capacity building and knowledge transfer to the volunteers.

Permission was sought from the concerned supervisor regarding the use of scrap wood on site. After the location of scrap wood was identified, the researcher was mandated with the task of sorting, identifying and ferrying wood that would be suitable to conduct the experiment in constructing the beehive sample. There are regulations regarding various activities such as welding on site or using intense metal cutting instruments besides identifying wood that could have been salvaged from furniture that had heavy metallic components. After browsing through the wood dump (see fig. 10 in Appendix 2) several pieces of wood were collected and ferried to the wood workshop. On further consultation with the expert, it was decided that some of the wood could be labour intensive to work on using hand tools owing to their nature, such as hard woods or larger planks of wood. It was discussed and resolved that more wood hunting would continue.

A huge shelving unit that was headed to the wood dump for onward forwarding to the energy recovery was identified. On further consultation and assessment, it was agreed that the shelving unit could make a good candidate for up cycling into a beehive for the purpose of wood recovery.

An additional intensive session was held to emphasize the importance of observing safety and tidiness in the workshop to avoid injuries and creating hazards for other users. It was instructed that all wood chips and debris should be cleared from the work area at all times. This is important in creating a clear working space. Amongst the key points discussed was regarding the placement of tools in the designated area to avoid wasting time while working. This can also give any other user the chance to use the tools if they are shared and therefore deriving the best utility of the tools.

Step 1. Moving the shelving unit for wood recovery

While the distance to the carpentry workshop is not long, a lone man could not move the shelve. Help was sought from one of the folklift operators. The shelving unit was moved by the use of a folk lift to a suitable location where it could be dismantled. The tools used for the exercise were a screwdriver, a wood work pincers for removing nails and a hammer. The task was performed without much skill but a lot of precaution was exercised to avoid injuries or damage to the wood.

Step 2: Cutting the wood into size.

Reference was made to the drawing and hive plans (see appendix 2). A short introduction was made on how to use the necessary tools. The cutting process entailed use of measuring tools such as; a square, a pencil, foldable measuring tape and a tenon and mortise gauge. The cutting was made using a jig-saw whereas F-clamps were used to hold the wood in place

on the work bench. The chisel and mallet were used to remove wood chips that were stuck with wood glue. Nails were removed using a claw hammer and a pair of pincers. After adequate practice with the hand saw, the jig saw was introduced with guidance from the supervisor. A few tips were shared on how to work faster while cutting duplicate pieces of wood. Hive strips were scavenged from the workshop's waste scrap wood were cut according to specifications listed on the hive plans. The waste strips were part of wood that was recovered from construction sites and thereafter used for construction of barn wood furniture. (See fig 4 Appendix 2). There was a variation in thickness owing to the different assembly of the shelving unit and the kind of wood available. The edges were made even using a rasp for the pieces that were not evenly sawn. All the pieces were confirmed as detailed in the beehive plan.

Step 3: Assembly of the beehive

The assembly of the bee hives required careful thought owing to the similarities in most of the pieces that were cut into size yet the different chambers perform different functions. A brief consultation meeting with the supervisor was held to ensure the base level was done as per the hive plans. The first step was to ensure that the base was well aligned, and that every piece of wood was square in cut. The square was used to check the correct internal fitting of the hive compartment. The workbench was an important tool in the assembly process. The clamps came in handy when two pieces of wood required joining. A technique of driving nails was learned. The most important undertaking was to ensure that the internal hive space was made to measure per the specifications. This proved to be a challenge because of the uneven wood. The workshop was equipped with power tools that were used to trim the wood in instances where the uneven wood was not too much of a hustle to align using hand manual tools. The legs were put in place and the lower pieces of wood were mounted on a trial basis. Once the base level was confirmed to be in place as designed, the sideboards were nailed. Additionally, the rails were installed where the frames would be sitting. At this stage, the first compartment of the hive could attest that the beehive was looking up, with the legs and the entrance. It took 2 hours to assemble the first compartment.

An attempt to assemble the second compartment was done. The compartment was assembled with improved speed of 30 minutes less compared to the first compartment. The time to assemble the second compartment was faster than the first assembly because the researcher was getting acquainted to the tools and the required procedures. The same challenge of uneven wood (from cutting and wood width) was encountered. Some nails were difficult to drive in some pieces of wood because it was harder (hard wood versus soft wood).

The third compartment constituting the brooder was assembled as per the requirements on the hive plans. The hive brood was different from the other compartments because that is where the queen is supposed to lay eggs and multiply the colony. With this in mind, some additional such as a "netting" material were sought. The brood is at the top compartment of the brooder. For the sake of this experiment, some modifications were done on the roof of the hive as it was discussed and decided that it cannot be feasible to construct a complicated roof in an environment where there was material deficits. Therefore, the gable roof was discarded and a simpler slanting roof was adopted. The slanting roof would require lest wood and metal sheets. Additionally, the experiment disregarded an extra compartment for the sake of sustainable use of materials. The experiment did not find it necessary to replicate a similar compartment that was already constructed. Additionally, the expert advised that

besides more material, the roof would take more time to construct. The pictures of the assembled hive are indicated in appendix figure 9.

Finishing touches

The experiment involved finishing touches on the beehive for various reasons;

Firstly, there can be need to observe and learn how much more resources (times and material) a product made from recycled wood for example a beehive can require.

Secondly, there can be need to ensure a uniform look of the final product.

Thirdly, there can be need to brand the products uniquely for marketing purposes with skills learned at the pimp department as a process innovation measure. Therefore, the complete beehive was moved to the upcycling/pimp department for further processing.

The main instruments required were: paint rollers, paintbrush, a scapel knife, paint and water. The process involved application of an undercoat water based paint on whole beehive by using a paint roller. This was done to ensure uniformity in the look for hive. This process can be justified when considering the marketability of the product. After the undercoat was sufficiently dry (after 24 hours). The experts at the upcycling department advised that at times it may not be necessary to apply more that one coat of paint depending on the purpose of the product. It was however recommended that a weather-proof paint would be appropriate to prevent destruction by weather elements. For the purpose of applying the techniques learned at the pimp department (brush stokes and finishing ideas) the beehive was partially painted using a light stroke technique to give it a more appealing structure. A stencil was made to brand the hive for easy identification (see appendix 2 figure 9).

Chapter 4: Findings

4.1.0 Findings from the case study at Estafette – an overview

In this section, the findings of the research at Omrin Estafette are discussed in context of upcycling used furniture for resale. Emphasis is drawn to the organization of processes and interrelation of various departments at Estafette that make it a success and therefore can be used as a lessons learned. This can form a basis for establishing a social enterprise that aspires to incorporate part of what is practically done at Estafette. An indepth case study was conducted at Omrin Estafette's premises in Leeuwarden. Omrin Estafette is a successful social enterprise that is run as a foundation. It is limited to making a profit of 1,500 Euros per year despite its busy operations and active thrift shops across several municipalities.

Estafette works with volunteers who make about 85 percent of the workforce. Most of the volunteers can be in between jobs for various reasons such injury, recovery from health concerns or other factors such as not being able to put up at a normal job immediately. Therefore, Estefette gives them an opportunity to bounce back into the employment system as well as hone new skills where appropriate. The furniture pimping studio and the carpentry workshop are an example of departments within Estafette where volunteers can hone new skills depending on their interests.

4.1.1 Open door policy

Estafette has an open door policy with management, staff and volunteers. This acts as a motivator towards a better work output. If an employee has a problem, it becomes easier to have it sorted out because there is openness in the chain of command. There is a lean management structure that is almost flattened. It can be difficult to know who is the boss because everyone interacts freely which is a good sign of a social enterprise that promotes social inclusion.

4.1.2 Employees welfare

The employees are provided with protective work attire. This includes workshop overalls as well as boots. This is an indication that the enterprise cares for the well being of the employees. Additionally, all those who work at Estafette are provided with branded clothing that can help in identifying those who work there owing to the heavy traffic in the thrift shops.

4.1.3 Discounted meals

The employees are offered meals at the restaurant at a fairly discounted price and this can contribute to significant savings for all the workers. All members of staff have a common dining room where they can take their meals as they interact with one another. Additionally, coffee is provided in the common area at the workshops where volunteers can crack jokes with each other as they enjoy their cup of coffee. This can be an important aspect of relieving stress or discussing other personal issues because of the condusive environment at the common places. The volunteers prepare their own coffee and clearing the table at coffee breaks in turns. This can be attributed an acceptance of shared responsibility and togetherness within the work force. Besides receiving monthly allowance from the municipal, Estafette additionally rewards the volunteers modestly each month for their noble contribution towards the enterprise. Volunteers can additionally hone their skills or acquire new skills at Estafette, thus increasing their employability chances should the want to move on to another employer.

4.1.4 Comparison of Case Study findings at Estafette with the Kenyan Context

Comparatively, the standarts of operations at Estafette are high and well organized. Besides, Estafettes's objective is not to make any profits as a social enterprise. In the literature review, it was ascertained that some social enterprises are founded with a not for profit objective and therefore they may have finances to support their operations. Estafette is supported by its mother company, OMRIN, which is a for profit organization.

The workshops are mainly staffed by Volunteers who are subsidized by the municipal. There is no such arrangements in Kenya in the magnitude that Estafette and the municipal undertake. However, with the high rates of unemployment in Kenya, such arrangements can be considered. There are initiatives where the government of Kenya engages the National Youth Service in training and national building initiatives where the youth are finally released to the market where they can use the skills acquired.

Most furniture manufacturers do not have sophisticated operations like Estafette does. There are no policy guidelines and work procedures. Besides, the nature of their formality can inhibit further registration with other services such as National Hospital Insurance Fund and National Social Security Fund. This tends to deny the entrepreneur and the workers some social benefit. Therefore it is unlikely to find discounted meals, open door policies and other welfare benefits.

Estafette offers the opportunity for the volunteers to hone their skills for further deployment or readiness to the job market. That is a noble idea and it can make a huge difference in the Kenya context if implemented. Some faith-based institutions especially the catholic church have implemented similar models where they rehabilitate youth especially street children. The workshops in Kenya run on a commercial basis. They are expected to pay taxes make statutory deductions to the government but such policies can be hard to enforce because some of the establishments are makeshift. However, more established formal enterprises conform to the regulations because they enjoy economies of scale.

There is a challenge in the lack of capital to scale up and improve on operations management. Therefore, it tends to be difficult to employ professionals such as accountants, marketers and human resources managers owing to the nature of the informal enterprises. The findings discussed indicate a clear difference in the situation and therefore the applicability of Estafette's model would highly depend on the financial resources available for some of the operations.

4.2.0 Findings from Experiment 1: Upcycling at the pimp workshop

Omrin Estafette is a social enterprise that resells used furniture and has incorporated an upcycling studio within the enterprise where furniture is distressed. The studio helps in increasing sales of pieces that would have taken longer to sell from the store. However some notable observations have been recorded from the experiment at the pimp workshop. These findings were noted from an in-depth study within Estafette's upcycling studio.

4.2.1 Assessment and evaluation of furniture before upcycling

Firstly, proper evaluation can be necessary before a piece is up-cycled. This can save on time and costs as well as avoid unnecessary undertakings. A good assessment of used furniture can determine the scope of work required on what has been sourced or what is available. Moreover, a detailed evaluation can help in knowing which technique can be used when distressing or making-over furniture especially in consideration of market demands. Once an assessment is conducted, a plan can be drafted so that proper estimates can be done. This step can be useful in documenting the work as well as for future reference as lessons

learned. Additionally, if the process is well documented, future trainees can learn as a knowledge transfer instrument. The finding is that if a piece of furniture is well assessed, it can be easier to determine what technique to apply in order to work more efficiently and achieve the best result. This can help in meeting the objective of increasing sales by having more appealing furniture that the customers are interested in. The main difference in Estafette's operations and the Kenyan context can be greatly attributed to availability of resources, both human and tangible goods including equipment. Estafette accrues much benefit because it is supported by the municipal and they can easily access discarded products as waste.

4.2.3 Availability of upcycling resources

There can be a variation of available inputs towards used furniture restoration. Estafette runs an account with a local supplier and therefore accessing inputs is not a challenge to the technicians. However, they have a policy to use the available resources sparingly without waste thus reinforcing the concept of sustainable consumption. The paints used are mainly water based with minimal environmental effects. The tools used in the upcycle workshop can be available at most hardware stores or they can be improvised. An example of a tool that was improvised in the workshop was a paint scrapper. A broken piece of glass was carefully used to scrap paint and it served the purpose like any other scrapper would do. Additionally, clothes and rugs for wiping dust while working can be recycled from worn out clothes such as tee shirts. Therefore, the findings can attest that establishing a pimp department within a second hand furniture store can be undertaken at minimal costs and therefore high-tech facilities are not required.

4.2.4 On the job learning; motivation and interest

Whereas some of the technicians at the pimp department have undertaken formal training in visual arts, not all the personnel have gone through such training. This has not limited new volunteers from working in the pimp workshop. Upcycling techniques can be learned by anyone who can be enthusiastic and motivated enough to undertake the tasks and more importantly to work in a paint workshop environment. This can attest that a learning mindset can take up new opportunities compared to a fixed mindset. Some technicians update and improve their skills through self motivated research and practice. In this day of information age, there is quality information available both in print and electronically. There are blogs, V-blogs and Youtube video channels that have visual step-by-step processes on how to undertake certain tasks. The technicians refer to interior design and home improvement magazines for motivation and sharpening their skill set. The finding indicate that a motivated individual can learn the skills and keep practicing the desired technique within a short duration of time, as long as they are consistent in their effort.

4.2.5 Financial value

Upcycled furniture can fetch higher prices of up to 100% or more of what it would have sold if not upcycled. This finding was reinforced by the price tag that was attached to the furniture pieces after upcycling and the pace at which the furniture sold for. For example, the stool was initially selling at 25 Euros but it sold at 65 Euros after upcycling. While the occurrence of fast selling was observed while conducting research within the showroom, interviews with the marketing department and the pimp workshop technicians confirm the same. This was authenticated because the researcher could not find any previously upcycled furniture at the Estafette showroom. This is because the pieces sell fast. Some customers literally keep checking at the showroom constantly just in case they find a new catch. Some of the customers purchase the pieces for resale. This indicates that an upcycled piece of furniture can create a further ripple effect in the chain of commerce. This can be an

innovative and feasible business consideration in product development where value addition can be considered and implemented. There can be room to investigate this further.

4.2.6 Studio set-up and safety

The upscaling studio is not sophisticated and therefore it can be incorporated as long as there is adequate space to work from. Work-benches are required as well as trolley tables to make it easier to move furniture while undertaking various tasks. The main entry door of the workshop should be wide enough so that some huge pieces can be brought in or taken out with ease. The studio had adequate ventilation and therefore an extractor was not necessary because toxic substances are hardly used. A work-space that can withstand three people can be an ideal start. A first aid kit was at hand just in case of any emergency. There can be many hazards such as furniture falling from the bench onto someone's toes, paint splashing into the eyes or skidding on the floor after wax spill. Toe-cap work boots are MUST have at all times while working at the workshop. Training in basic first aid skills can help in mitigating worsening situations before serious medical attention is sought.

4.2.7 Discussion of the upcycling workshop in the Kenya context

Furniture up-cycling can be implemented in Kenya within a social business where skills can be shared especially from college students in the field of art. The up-cycling workshop does not require as much capital resource compared to a carpentry and prototyping workshop. Safety precaution can be the most critical consideration as well as the kind of paints that can be available in Kenya. Interesting activities can be created so that attention can be drawn to those who can take up the skills. Basic tools can be easily available or improvised as experienced by the researcher when a broken piece of glass was used as a scraper in furniture up-cycling. Other accessories such as rollers and paintbrushes can easily be available at hardware stores in Kenya. Furniture distressing skills are not common in Kenya and therefore this can be an innovative way boosting second hand furniture sales. The main consideration would be availability of space, where the studio can be set up and labour to undertake the tasks.

4.3.0 Findings from imitation experiment 2:

Salvaging wood from discarded shelving furniture and up-cycling the wood into a bee-hive.

This experiment was conducted with the objective of finding out how discarded wood as well as wood salvaged from discarded furniture can be repurposed and upcycled. It could be any other wood that can be put into good use owing to the timber deficits in Kenya. Used furniture that is discarded at Estafette ends up at the energy recovery facility. However, there are useful components in discarded furniture that can be repurposed into new products.

4.3.1 The process of salvaging wood

The research found that salvaging wood can be a time consuming process. Most discarded wood is not arranged orderly as it is assumed to have reached the end its useful life. With this observation, then, it can be expected that the interested persons (salvager) should be ready to work extra hours while sorting out appropriate wood for their intended use. In this regard, 1.5 hours was spent flipping through junk wood, hunting for wood that could be used in the bee-hive imitation experiment.

4.3.2 Exposure to weather conditions

It was found that most discarded wood was not sheltered and was therefore piled in heaps. Besides undergoing damage such as breakages while handling, the wood can depreciate due to harsh weather conditions. The wood can be rained on as well as being exposed to excess

sunlight. This can result in warped wood that can be challenging to work with. Water can damage wood as it becomes prone to rotting. Some of the discarded wood had traces of rotting and therefore repurposing can be difficult. Some traces of holes indicated that insects could have infested some of the wood due to open exposure for a considerable time without treatment.

4.3.3 Contaminated wood

It was found that it could be a challenge to know if the available wood may have been previously in contact with toxic substances. In this regard, caution can be exercised or, where possible, a thorough background check can be done to establish the source of the wood. Hand gloves can be used while handling the wood as a safety precaution. After selecting some wood, it was communicated that it could not be suitable because that lot may have been contaminated and therefore not suitable to work with. However, a search was recommended at a different lot where a discarded shelving unit was identified. The shelving unit had been denied entry into the showroom and therefore it had been marked for onward forwarding to the energy recovery facility.

4.3.4 Tools and auxiliary equipment for handling wood

Simple manual hand tools can achieve the desired output although at a slower speed. The research found that it is worthwhile to have appropriate tools while scavenging for wood for re-use. The shelving unit had to be dismantled in order to use the wood. Such an exercise cannot be carried out without the necessary tools. However, simple tools such as a hammer, a screw-driver and a cross cut saw can make work easier. Dismantling furniture units on site can save on transportation and handling costs by easing the bulkiness. In the absence of tools, it can be prudent to hire someone to handle the wood. Whereas this can be a feasible option, it may not hold water because the one of the objectives of is to create employment within the social enterprise. Power tools can increase efficiency if well utilized. Estafette is equipped with all the necessary tools although they are pricy to purchase. They additionally require external source of electricity to run.

4.3.5 Wood Working skills

Working on wood requires some basic skills for trimming, sizing, cutting and nailing. It was important to acquaint with basic wood working skills that could be learned on the job. The relevance of such skills would be handy in the construction of a repurposing wood as well as up-cycling furniture. A tutorial that included hands-on practice on using hand tools was conducted. This research found out that motivation is key to learning and undertaking a new skill set. Such skills can be handy while making necessary repairs on used furniture. The skills are also important when repurposing wood for other functional products.

4.3.6 Metallic hazards in scrap wood

Recycled wood can contain harmful metallic components such as screws and nails embedded in them. Extra care should be exercised when working on recycled wood, whether from used furniture or any other source. This is because metallic components can damage tools and loose chips can be harmful to the user. Wood cutting equipment blades are not suited to cut metallic items. It can be necessary to use metal detection equipment to check for metals in recovered wood.

4.3.7 Uneven wood

Salvaged wood at Estafette is available “as is” because it is usually headed for energy recovery. The wood used in the beehive experiment was uneven in terms of thickness and length. It was recovered from an existing shelving unit. It was necessary to trim the wood into various sizes according to the specifications. The challenges of working with uneven

wood can be overcome by using appropriate power tools that make work easier and efficient. In some instances the cosmetic appearance of recycled wood products can be compromised especially where appropriate tools are not available for faster precision cutting.

4.3.8 Repurposing wood from furniture into other products

The research found that it is possible to repurpose wood from discarded wood (whether previously used as furniture or other uses such as building and construction) into other functional and more productive products. However, a lot of factors should be considered owing to the expected final product output. Smaller pieces of wood can be joined together to attain the desired length. Some skills set are necessary in order to work efficiently. Basic skills can be easily learned and perfected with time. There can be challenges working with recovered wood because some power tools may be required. For example, if the woodworker wanted to trim a 3”X 2” piece of wood horizontally, it can take much longer to cut using a hand saw compared to trimming the same piece of wood using a table saw.

4.3.9 Finishing touches

The experiment found that the finishing touches on products made from repurposed wood attract more attention compared to those that were not touched up. The beehive pictures were used as a survey sample with 20 respondents where a photograph of the beehive was displayed before and after finishing touches were made. 95% of the respondents indicated that they would rather have the painted beehive because it looked more appealing and could help in ownership identification. 5% of the respondents indicated that it did not matter because painting the hive could possibly increase the production costs that would be passed down to the customer - see appendix 2 fig 9. Display the difference in the beehives for cosmetic appeal.

4.4.0 Discussion regarding the bee-hive construction exercises in the Kenyan context

There can be a variety of products made from repurposed wood. Barn wood is mostly used as wood fuel. The exercise of constructing a beehive can be an eye opener regarding the assortment of products that can be remanufactured from discarded wood. Timber yards in Kenya stock wood that is sold as firewood. The wood comes from inefficiencies in trimming and resizing mostly due to inefficient technology in wood processing as mentioned in the literature review. Wood can be salvaged for further product development. Small pieces of wood can be used for example to make serving spoons as well as handles. For this to be successful, appropriate equipment is required. There are many jobless people who can learn skills that can ensure wood is not wasted owing to the current deficits experienced in Kenya. Appropriate collaborations with government vocational training institutes can speed up intake of new skills towards efficient use of timber. The exercise informed that manufacture of secondary products can be scaled up and create new revenue streams. The basic hand tools can be purchased in Kenya. However, a collaboration can be explored with social enterprises like Estafette to see how best discarded tools can be collected and sold affordably to Kenya. There can be some challenges in handling uneven wood in the absence of proper equipment. Exclusive use of hand tools can be counter productive beyond the learning stages due to the limitations of speed.

5.0 Discussion

A social enterprise that sources, repairs and resells used furniture can be set up successfully in Kenya. Such an enterprise can help in bridging timber deficits as discussed in chapter 1. However, handling used furniture requires a careful plan for the enterprise to be successful. Estafette's pimp studio and carpentry prototyping workshops are discussed in the context of an ideation hub in Kenya, thus 'circular ideation hub'

5.1.0 Findings from the case study interview at Estafette in the Kenyan context

Estafette is a social enterprise that is **not** motivated by profit but the promotion sustainability within the community where it operates. This confirms what was confirmed by literature review on the objectives of some social enterprises. At a large scale, they avail products that would have been disposed as trash back to the market. Estafette is primarily concerned with social inclusion where volunteers, who constitute about 80% of the workforce are given a chance to bounce back to life as well as providing a learning environment for all. The circular economy concept is applied within all their thrift shops and therefore usable items are ploughed back into the market thus prolonging their lifecycle. There is transparency in the selection of volunteers within the shops and it is evident that they are popular in the Frisian Province in the North of Netherlands. The workforce is enthusiastic and they look forward to another working day because of the enabling work environment. For instance, one of the staff stated that they are very happy about the flexible work hours that enable having sufficient time with their children. This is an indication that part of what makes Estafette a successful foundation is the elaborate staff welfare concerns. This approach can be aped by a social enterprise that aspires to set shop in Kenya.

Estafette works with a very limited budget and therefore they must be innovative in order to achieve the desired results. Whereas they are not allowed to make profits because they are not not profit organization, Estafette exploits the free social media platforms to get word out and reach their customers. They have an active facebook page, Kringloop Omrin Estafettte where updates are posted and new offers announced. This indicates that a social enterprise set up in Kenya can use the available tools and instruments for marketing purposes at very low or at no cost in this digital age where the world is a global village

Innovative partnerships can help in progressing the sustainability of a social enterprise. Estafette partners with other like-minded organizations in promoting repurposing and co-creation of products. This kind of collaboration helps in projecting the sustainability story further by reaching more people who can easily convert into being environmentally conscious. There are many tools that can be consolidated and shipped to other parts of the world where they can be re-used and offer a longer service life. A social enterprise in Kenya can benefit from such an arrangement. Training collaborations can be organized online through webinars by inviting experts to offer tips on latest developments in wood recovery and avoidance of waste.

A second hand furniture showroom in Kenya can be modeled in an attractive way so that customers can feel at home while shopping. Second hand furniture dealers pile the furniture on top of each other and it can be unattractive to the customers. Estafette is modeling all its furniture showrooms in such a way that customers can have a practical feeling while sampling furniture. For example, a dinning set furniture can be displayed in readiness for

having dinner, with cutlery set up on the table. Other furniture retail stores such as IKEA[14] also use this furniture display model.

It can be worthwhile investing in an identity mark as a sign of authenticity especially for upcycled furniture or the furniture made from burn wood. This can boost the perception of the furniture especially to conscious customers who believe in sustainability. This can promote acknowledgement of intellectual property rights in Kenya. The beehive final output was branded as an eample. (See appendix 2 figure 9).

Literature reviewed in the context of furniture manufacture in Kenya indicates that there can be a lot to borrow from Estafette's operations. Kenya does not have a sophisticated and innovative social enterprise as sophisticated as Estafette.

5.1.2 Establishing a "Cicular ideation Hub" in Kenya

A social enterprise that incorporates a product development hub can be established to offer value addition and nurture trade skills in used furniture repair and up cycling in Kenya. The hub can be named "Circular Ideation Hub". The Circular Ideation Hub can provide an important platform as a public-private partnership where seed capital can be mobilized through crowd funding or government grants to motivate the set-up and facilitation of equipment that can be used in the repurposing of products from used wood.

A Circular Ideation Hub can improve the availability and relevant of training in trade skill and furniture remanufacturing and upcycling. The operations at Estafette can be emulated whereby people learn new skills over a period of time, for example one to six months. Such a hub can initially be set up virtually and begin with the provision of technical and managerial extension services to interested persons and small enterprises. The Hub can provide need-based assessments and skills transfer extension services through tailor made training. Additionally, the hub can provide training on different ways of repurposing used wood, including composite materials that can use less wood.

The key factors and challenges that can be encountered in setting up a Circular Ideation Hub in Kenya include:

- Constituting ownership and raising seed capital for its development and initial operations;
- Intricate understanding of the local furniture industry in the context of adopting circular economy ideas.
- Offering demand-driven circular economy consulting services at competitive fees.
- Staffing the hub with qualified personnel (and access to facilities) can be a challenge due to few practitioners in the circular economy principles.

5.1.3 Prototyping facilities

The Circular Ideation Hub can incorporate prototyping facilities that can develop an assortment of products that embrace the circular economy.

[14] Retrieved 240817 from http://www.ikea.com/us/en/catalog/categories/departments/living_room/tools/coli/roomset/20173_cold01a/

The circular economy promotes sharing to increase utility of products and services. Therefore sharing professional tools and machinery can be achieved at a circular ideation hub. This can help in creating professional prototypes thus rendering a service to aspiring small businesses. Consequently such services can:

- Improve on quality and design; and
- Cushion manufacturers against spending their working capital in real pre-produced furniture items but prototypes especially when trying out what products can be realistically manufactured from discarded wood.

An ideation hub can create further jobs as individuals using the machines and tools would pay for the services. The hub can also learn from best practices from other outfits such as Estafette.

5.1.4 Increase access to training

The government can offer duty exemption for importation of modern wood processing equipment and offer discounted training packages to promote adoption of new skills and competencies especially in acquiring new knowledge. This can happen through private and government institutions' collaboration. It was learned that Estafette encourages training and skills build up within its premises and this can be a model to ape if resources are available.

5.1.5 Collaboration with informal furniture manufacturers via clustering

The informal furniture manufacturers can be organized theough the hub in such a way that they can produce components for the larger manufacturing firms. Estafette, for example makes custom fixtures for customers using recycled wood. Such component can include mirror frames made from barn wood. This can ensure economy of scale is achieved as well as facilitation of specialization and improvement in productivity and value-addition.

Chapter 6.0: Conclusions and recommendations

This section outlines a convergence between literature review and the findings from the methodology applied in forming a basis for establishing a social enterprise that can source, repair & upcycle (if necessary) furniture as a measure in bridging timber deficits in Kenya. It also sheds some light on how the circular economy can be applied in technical nutrients recovery and the ripple effect in the possibility of creating more opportunities such as employment, training and within a design and product design hub.

6.1.1 Business Development

The experiment conducted in wood recovery from discarded furniture (the shelving unit) indicated that further business can be developed within a social enterprise that has necessary equipment to repair and resell furniture. A beehive was constructed from wood salvaged from the shelving unit. This kind of approach can be used to further develop a social enterprise into other more sustainable innovative solutions that can create more opportunities. A beehive and beehive products can evolve into an independent industry and improve incomes to people at the base of pyramid. This can increase the enterprise's revenue streams and avoid machine downtime.

6.1.2 Innovation

Innovative ways can be used in selling and marketing furniture and other products that are co-created from a social enterprise. The social media platforms such as Facebook and Instagram can be used to reach customers through niche market groups. Estafette has a facebook page where they discuss products and sale offers. They advertise furniture that is made from recycled wood from their carpentry workshop. They additionally hold bid auctions through a booth inside their showroom whereby the highest bidder wins. These innovative ways of market penetration can be applied by a social enterprise in Kenya as well. In Kenya, there are Facebook groups such as Builders & Co-creators where buyers and sellers of innovative products meet and conclude sales online. There are online listings such as OLX where products can be advertise free of charge.

6.1.3 Setting up a "Circular Ideation Hub"

A circular ideation hub can be incorporated as part of a social enterprise that resells used furniture where repairs can be undertaken. Simple hand tools such as an assortment of handsaws, hand drill with different bits, planer, rasp, square, hammer, mallet, screw drivers, spanners, spokes shave, set of chisels and a workbench can be useful as a starting point. However, a fully equipped prototyping workshop can be ideal for scaling up remanufacture and repurposing of furniture and other products. The manufacture of furniture from barn wood, recycled wood from construction sites and wood pallets may require power tools to ensure the workshop runs more efficiently besides repairing furniture. A well-equipped prototyping workshop can be used as a capacity building centre, offering short technical training in upholstery carpentry and joinery. It can provide other services such as information dissemination regarding opportunities in the circular economy.

6.1.4 Furniture distressing studio

It can be prudent for a second hand furniture resale enterprise to incorporate a furniture distressing/upcycling studio that adds value to furniture using techniques that could be trending in the market. Distressing techniques can be learned from online sources such as YouTube. These resources are available free from the internet. Additionally, furniture distressing skills can be learned by referring to books and magazines. Anyone with a learning mindset can learn how to distress furniture through practice.

6.1.5 Employment creation

Employment can be created for the people who work in the workshops, both at the wood pimp studios. Unemployed people interested in learning new skills can apprentice at the studio and earn some commission every piece upcycled and sold. This can happen contrary to Estafette's model whereby the municipal provide the monthly allowance through welfare. This system is non-existent in Kenya at the moment.

6.1.6 Source of furniture

A used furniture resale and repair social enterprise can successfully be set up in Kenya. There are several lessons learned from how it can be made successful after an indepth study at Omrin Estafette. Whereas some of the opportunities available at Estafette through all the Municipalities that supply them with used furniture at no cost may not be available in Kenya, local used furniture can be upcycled and resold as well. The main difference in the Kenyan context is that used furniture has to be purchased.

6.1.7 Importing used furniture

Additionally, new business opportunities can be created through importing used furniture and therefore promoting the circular economy. Used furniture can be imported from Netherlands, Estafette being a good source because they sell used furniture at an affordable price. Estafette retails the furniture without giving any priority to any specific buyer. It is an open market for all prospective customers. However, the importation process must be well understood owing to government regulation.

6.1.8 Collection point and/or warehousing

To effectively collect furniture for export from Netherlands to Kenya, a collection warehouse can be required as the furniture cargo container waits to fill up. This can significantly increase the overhead costs of doing business and therefore sourcing used furniture can be intensified from more dealers so that the containers can fill ups as fast as possible. However, it is possible to consolidate cargo with another shipper should either party have loose cargo.

6.1.9 Affordable prices

Estafette offers used furniture at an affordable price. This ensures that they sell in volumes. Some customers buy from Poland in bulk on tracks. The price is usually fixed for every prospective buyer unless there is a clearance sale. For a social enterprise to be successful in Kenya, it can be important to ensure the prices are affordable to the target market. Market segmentation can be done through social media platforms where price can be communicated for faster sales and offers.

6.2.0 Improve productivity and innovation through better skills and technologies

These actions can be applicable in the Kenya content while addressing the furniture manufacturing gaps as discussed in the literature on product development hub. With the above mentioned recommendations, a social enterprise can be established in Kenya within the appropriate social and economic frameworks that are required to reduce youth unemployment and end insecure, low paid, precarious and exploitative working conditions. Targeted cross-sectoral support measures should promote relevant skills building and mentoring. Additionally, internships and on the-job learning opportunities at vocational training institutions can be encouraged.

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Appendix 1

About Kenya
Kenya is an East African nation situated on the equator on Africa's east coast and has been described as "the cradle of humanity". The population of Kenya could be more than 44.4M (World Bank Group, 2016) way above the official statistic of 38,610,097 million (GoK 2010). With a population growth of 2.14% per annum and 61% of the population is between 15 and 24 years.

Legal boundaries: Located across the equator, Kenya stretching from latitudes 4° North to 4° South and longitudes 34° to 41° covering Kenya covers an area of 582,646 sq. km.

Government:

Kenya is a democratic government country with these arms: The Executive, The Legislature, The Judiciary and The Devolved Governments. The Executive arm of government consists of The President, the Deputy President, and the cabinet. The presidential, parliamentary, senatorial, and governor elections take place every five years with the last held in March 2013. There are 349 members of The National Assembly and 67 members of The Senate. There are 47 administrative County governments headed by the County Governors.

Economy:

Kenya's GDP is KShs 3,798 billion (US$ 39.15 billion) with agriculture (cash crop farming of tea, coffee and flowers) and forestry (forest products such as timber) contributing the – 25.3% of GDP by activity and 13.1% to growth (CBK, 2015).

Main characteristics of Kenya:

The climate ranges from tropical in the south, west and central regions, arid and semi-arid in the north and north-eastern regions. Kenya's terrain rises from a low coastal plain on the Indian Ocean in a series of mountain ridges and plateaus. The famous Great Rift Valley bisects the country above Nairobi, with several lakes and volcanic mountains as you head towards Western Kenya (see Fig. 1). There are other economic activities in tourism, service sector, transport and communication as well as precious metal mining.

Legal and regulatory frameworks in the forest sector

The forest and timber industry is regulated by two Acts of parliament: the Forests Act (Cap 385) and the Timber Act (Cap 386). The Forest Act gives the Minister for Environment & National Resources wide powers to declare any land that has not alienated to be a forest area. The Minister can therefore declare the boundaries of the forest alter the boundaries. The Minister also has powers to declare that a forest area cease to be a forest and is required to do is give a 28-day notice to the public via a Kenyan gazette notice. Proper legal channels have to be observed. The same Act grants the Minister powers to issue licenses for the use of forest produce. The Ministry of Environment and Natural resources has autonomous government agencies namely; National Environment Management Authority (NEMA) that deals with national environmental enforcement matters, Kenya Water Towers Agency (KWTA) that deals with protection of water towers, Kenya Wildlife Service (KWS) that deals with the protection of wildlife, Kenya Forest Service (KFS) that deals with the protection and development of forests and forest products and the Kenya Forest Research Institute (KEFRI) that deals with research in forest products and forestry biodiversity.

DEFINING CONCEPTS

Key concepts not only have influence on the progress of the research projects but also on steering the capacity of the research questions (Verschuren & Doorewaard, 2010). For the purpose and boundary of this research, the following key concepts were defined:

Circular economy: is an economic concept that emphasizes on maintaining the value of materials throughout the life cycle of a product by a well-planned design. It is an industrial economy that is intentionally restorative and aims to rely on renewable energy, minimize, track, and eliminate the use of toxic chemicals; and eradicates waste through careful design. (Ellen MacArthur Foundation, 2015). See appendix 1 figure 3

Sustainability: Entails creating and maintaining the conditions under which humans and nature can exist in productive harmony to support present and future generations (EPA, 2017).

Social entrepreneurship: "Dees (1998a) proposed that social entrepreneurs are change agents that possess five distinct criteria: 1) adopting a mission to create and sustain social value; 2) recognizing and relentlessly pursuing new opportunities to serve that mission; 3) engaging in a process of continuous innovation, adaptation and learning; 4) acting boldly without being limited by resources currently in hand; and 5) exhibiting a heightened sense of accountability to the constituencies served and to the outcomes created (p.4). This definition of social entrepreneur was further refined by Dees et al. (2002) as idealistic, forward-looking people who are innovative, opportunity-oriented, resourceful, and value-creating change agents. This description of social entrepreneur, according to Jones et al. (2010) has become one of the most cited descriptions of social entrepreneurs in the literature" (Kadir et al., 2016)

Sustainable consumption: this refers to the use of products and services that have a minimal impact on the environment (Watering & Wyatt, 2011).

Perceived value: this is the worthiness of a certain product/service from the perspective of a customer as the comparison between perceived performance and expectations (Ulaga & Chacour, 2001)

Consumer loyalty: this occurs as a result of consistent positive emotional experience, physical attribute-based satisfaction and perceived value of an experience (Chang & Fong, 2010).

Product functionality: this is a feature that a product has that enables the product to do what it's supposed to do for example to address customers' needs (Daft, Murphy, & Willmott, 2014).

Business Model: "a business model describes the rationale of how an organization creates, delivers, and captures value" Alexander Osterwalder – "Business Model Generation"

Business incubator: a business incubation is a method of creating new small businesses by providing and nurturing SMEs in range of services such as space provision, common services, hands on assistance, including Research and Development (R&D). It also provides advisory and risk capital, usually through a network of external providers (Adegbite, 2001)

Planned Obsolescence - is the intentionally producing goods and services with short economic lives and that stimulates consumers to repeat purchases in a shorter period of time (Slade, 2009).

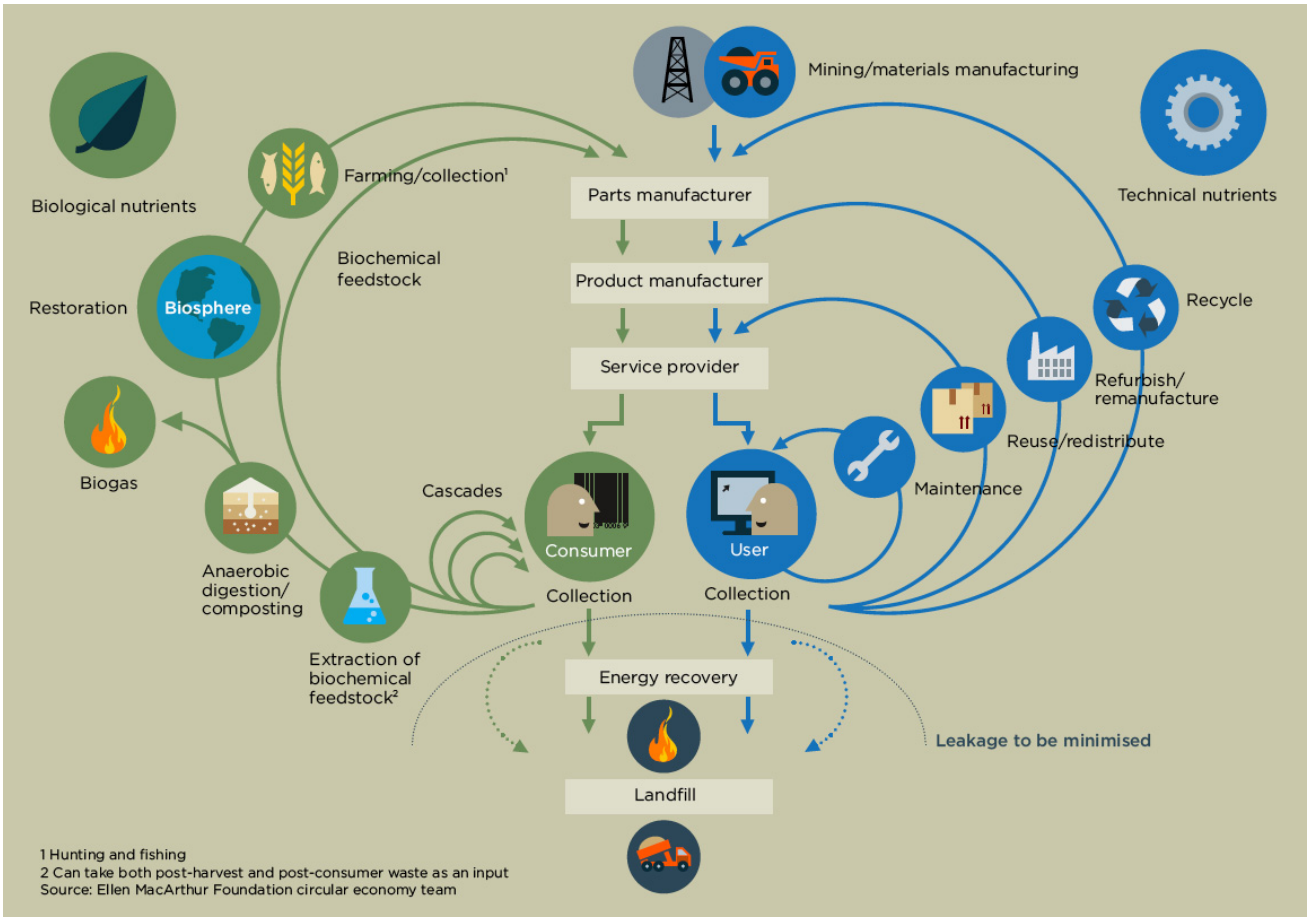
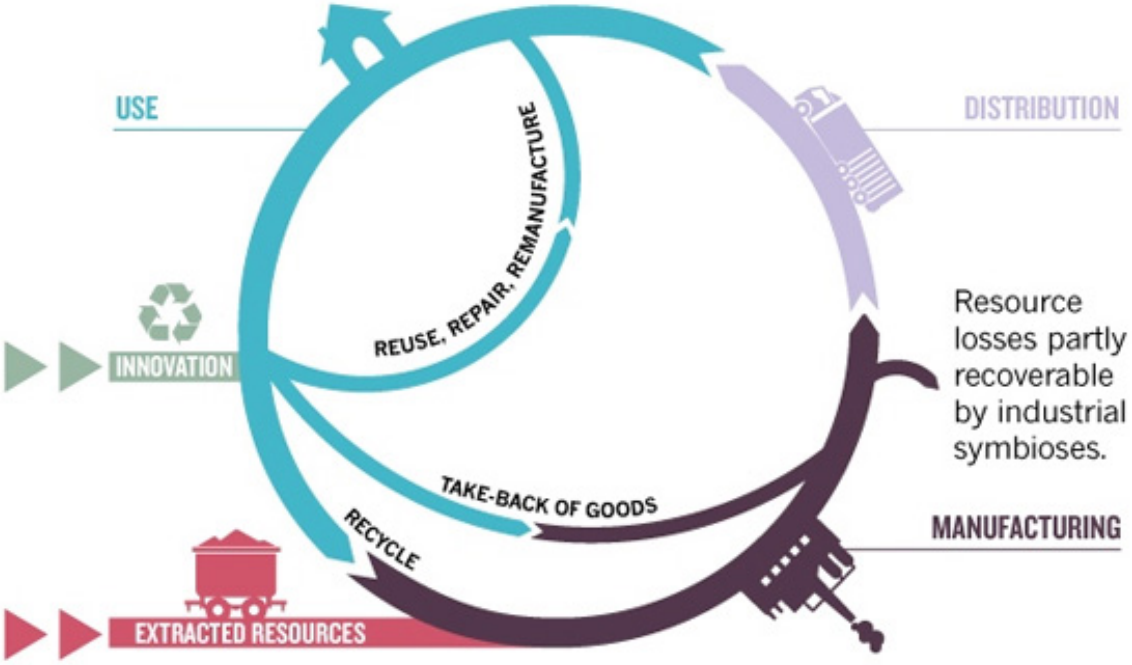


Figure 3: The circular economy—an industrial system that is restorative by design

CLOSING LOOPS

Using resources for the longest time possible could cut some nations' emissions by up to 70%, increase their workforces by 4% and greatly lessen waste.



INNOVATION

Research is needed to transform used goods into 'as-new' and to recycle atoms.

EXTRACTED RESOURCES

Water, energy and natural resources enter the manufacturing process.

MANUFACTURING

Renewing used products lessens the need to make originals from scratch.

DISTRIBUTION

Ownership transfers from manufacturer to consumer at point of sale.

USE

Is controlled by buyer-owner-consumers of goods, or by fleet managers who retain ownership and sell goods as services.

Adapted from Knowledge Transfer Network

Figure 4: Closing the loops.

APPENDIX 2:

Interview Questions and transcripted answers from Key informants at OMRIN Estafette

Interviewee: **Marianne Couperus, Communications/marketing Officer,**

OMRIN Estafette

1. What kind of enterprise is Estafette? Is it a social enterprise or is it purely for profit?

Answer: Estafette is a social enterprise. We are a foundation. Estafette is managed as a charity. It is the social face of OMRIN, our mother company. OMRIN is a for profit company.

2. How is the Management structure of Estafette organized?

Answer: The management structure is provided. See the sheet

3. How is Omrin's staffing done and what skills are required in accepting the members of staff especially those that work at the carpentry workshop and the pimp department?

Answer: Most of our staff are volunteers who mostly do not have work. Some of them just seek a useful way to spend their free time.
Others are interested to get to normal jobs but they do not know how to go about it. Estafette gives them a chance to start on the job and gain experience too. An opportunity is therefore provided at Estafette within the various departments so that they can finally get to normal jobs. We receive a part of the volunteers from the City Council who maintain a database of people who seek such opportunities especially those under the government support. The city council role is to ensure that the people in the database are placed in some gainful activities so that they do not live on the government for free. However, Estafette has a final say on the people selected to work at its premises. About 350 people work at Estafette of which about 275 are volunteers. The minority are staff of Estafette (for example: in Leeuwarden there are 125 volunteers and 15 staff members). Some of the volunteers could be going through some life challenges such as recovery from depression or post recovery situations from an injury and could have been out of the normal work system for a period of time. At times there are not enough volunteers especially in some specialized skills and this can create a gap in the production process especially in the carpentry workshop. However, the main advantage of commissioning the products through Estafette is that the products are cheaper because the objective of the foundation is not to make profit but to create social value. The maximum profit allowable is Euro **1,500 (per year!)**

4. What is the innovation behind OMRIN Estaffete shops and what influences customers to make purchases?

Answer: The concept of the circular economy whereby we avail products that would otherwise have been wasted by prolonging the product life cycle. Recycle Boulevard is a new concept and will be a first in Netherlands! We try to make our services unique and add value as well as working with others who are in a similar field. Estafette is for example working in partnership with Leeuwarder Collectief who make products for Lion City Festival. They make festival decorations from scrap (from Estafette), currently situated at Kringloop Estafette. Those same people in return will help our staff to recognize the products that can use for recycling or upcycling, so more of our waste can be used again. Estafette intends to make themselves well known in the region and in the country at large.

5. How is the marketing of the various products done, especially the furniture in your stores?

Answer: We actually have little marketing budget and therefore we mostly use the freely available instruments on social platforms. We are using the social media; Facebook, LinkedIn and Instagram for instance.. We have to pay a fee to Facebook to 'boost' certain posts (to make it read better by a bigger and various group of people on Facebook) and therefore we are still working out the budget.

6. Is there any special consideration when determining the layout of the shop space in displaying the furniture that you have?

Answer: At the moment we are working with an interior architect to display our products in a homely manner, possibly just like IKEA does. Re-modelling of the shops is ongoing so that all products can easily be seen on display. More importantly, we are incorporating neuromarketing in our showroom designs. We make sure that people are almost obliged to wander around the whole shop instead of just visiting 1 area by using good routing, the heights in the building and making sure we surprise them at every corner. Also by using storytelling in the shop to make sure people know what the story of Estafette is and making sure they leave with a positive feeling and the idea of ' I want to come back here'.

7. Is there any differentiation in positioning between the furniture constructed from recycled wood and the used furniture at the Estafette showrooms?

Answer: YES. Furniture manufactured at the Estafette workshop is differentiated from the rest as it is normally unique in appearance. We are currently redesigning out showrooms to suit specific products in different sections. However, the new model will entail reshuffling the products every so often so that the showroom can always look new even to regular customers. It is work in progress. We however have specific flyers/brochures/posters that give more details (storytelling) within the showroom, about our carpentry workshop products such as open garden kitchen furniture, garden furniture and fittings. I would also want to make a unique differentiation label to be part of our trademark of authenticity. The (? What) should be subtle though, when we implement the idea.

8. Who and how is the price of recycled wood furniture and the pimp department furniture prices determined?

Answer: Kindly consult with the carpentry manager/supervisor

9. What tips would you give to a person who would like to initiate an enterprise that would be selling used furniture, pimped furniture and furniture made from recycled wood?

Answer: It depends on the budget at hand. We work with a small budget and therefore our most accessible and affordable platform for our marketing is social media. If well explored the results can be amazing.

10. Lastly but not the least, what do you feel about working at OMRIN and the future prospects?

Answer: I am very happy working at Estafette. Firstly, the fact that I have to work with a very limited budget means that I have to be very creative and innovative to achieve the desired results. I am also happy about the work hours that enable me to take care of my children – I work 24 hours every week, staggered for the deliverable input of my work! I also enjoy the flattened model whereby we are not much of a hierarchical organization in the staff and management structure.

Interview questions with Key informant at Omrin Estafette Carpentry workshop

Interviewee: Mr. Eqbert van der Mossel

What are the most important tools to have in an up-scaling workshop?

Answer: Hand tools are the most important. With hand tools you can manufacture all the wood products you need. The variation can only be the time you have to perform the tasks.

- Work bench/table – surface of operations or workstation
- Hand saw (s)
- Hand drill (s)
- Measuring tools – Tape measure, square, rule
- Mallet
- Clamps – F-Clamps
- Rasp
- Chisel
- Hammer
- House keeping – Clean work area, all tools should be on specific places for ease in access

How do you manage the timber acquisition process?

Answer: Estafette buys raw wood from construction sites and hardly buy virgin wood. Customers make requests for furniture with certain styles especially with rustic looks. There is an advantage in using raw wood because at times it does not require very advanced skills to work on. Expensive wood requires polished skills and a lot of care while working on. Therefore the kind of wood determines the kind of products we make too.

Why do you use recycled wood?

Answer: Most of our customers prefer raw wood and we like working with such wood because the end products do not have to be even. Some ruggedness is allowed and our joinery is also not very precise, though sturdy. Most of the people we get orders from like it as it is.

How do you calculate the price of the furniture?

Answer: We calculate the cost of each piece of wood used, every piece material and labour based on costs. Experience has enabled me to be able to estimate the time that would be spent on the any product case by case. Therefore my costing is mainly based on the item to be manufactured.

How does the carpentry workshop embrace the circular economy?

Answer: We do not use scrap wood very often because we have so much coming in but at times we experiment with a few items from discarded furniture wood that can be repurposed to different products. There has been a recent trend to upcycle old sewing machined to beautiful furniture using scrap wood. The ideas from customers determine what we make because most products from the carpentry workshop are custom made. We however recycle wood from the construction sites to make new products such as cabinets, chairs and kitchen fittings. The customer determines what we make. The current trend is biased towards recycled construction site wood. The wood would have otherwise been used for energy production but we extend the life through new products.

How often do you up-grade your power machines?

Every year our machines are tested for safety as a requirement by the government regulation. Most of the machines have warranty from the manufacturer. However, if the machines are broken and the warranty is over, the machines are passed on for recycling. We thereafter acquire new ones. We purchase professional electric hand tools that we use for many years. We therefore get good service from our tools. We recommend that you invest in quality tools.

Question: How often do you use hand tools?

Answer: We hardly use manual hand tools these days. Sometimes we access many hand tools from the trash and we do not have use for them. We can only collect too much. We use professional electric hand tools that can last long if well handled and do not need to be replaced often. Manufacturers upgrade Electric hand tools often and it may be difficult to keep up with the trend.

Where do the discarded tools go when they are thrown away?

The tools are dismantled by the recycler and sorted as scrap wood, metal or plastic. Plastics and metals are separated for further processing.

Question: What would you advise a prospective social enterprise that wants to set up a workshop in Kenya.

Answer: First it would be important to determine the challenges on site such as availability of tools, electricity and level of skills set. It is important to learn the basic wood working & carpentry skills. They must learn how to use hand tools in learning the skills. Once the basic skills are learned with manual hand tools, a shift can be made towards electric tools that can make the work faster. The importance of hand-tools is that you can always revert to them in solving a problem when the electric machines fail.

Question: What do you think can be done about the used tools that are dumped?

Answer: We come across many tools that we do not need and therefore we cannot keep accumulating in our homes. It is a pity that such tools are thrown away yet they are still functional. If there is need in other parts of the world such as in Kenya, maybe I can arrange collect and arrange to ship the tools through whatever appropriate means.

Question: What are the most important heavy-duty machines to have in a workshop if you need to scale up production?

Answer: It would be necessary to have a cutter because you can work faster and the quality of work can be higher. It would be important to consider the electrical power input i.e. 3-phase or single phase – 220V or 380V

- Compound Mitre saw
- Table saw

Question: What advice would you have for a policy adviser towards used tools?

Answer: This is a hard question for me. I am not able to answer adequately. Most people hire experts to do the jobs. e.g painting.

Question: Who dumps the tools?

People who previously bought them through some hype dump most tools. For example when a new product is released in the market. Most of the dumped tools are in the DIY range of products. Some people buy the tools during a hyped sale offer and only use the tool for one time. The tools can lie in the shelf for 2-3 years without being used and finally it is replaced especially when a new product is launched. This is more of DIY tools consumerism. Most of the dumped tools are hardly in the professional series and are inexpensive.

Interview questions and answers from the pimp workshop technician at OMRIN Estafette

Interviewee: Mr. Robert Spiekstra

Q. Could you kindly introduce yourself?

Answer: My Name is Robert Spiekstra and I work at Omrin Estafette at the Pimp and up-cycling workshop. A friend introduced me to Estafette after I injured my shoulder and I wanted to get back to a productive life. I always wanted to work in the creative industry although I had not trained in the field. I work with my colleague, Peter who was working alone before I joined Estafette. We brainstorm together in creative thinking. Over the years we have had several other people working with us including a lady who was very creative in her use of colours which was inspiring to us.

Q. Why do you up cycle furniture and what influences what furniture you upscale through pimping?

Answer: First of all, it is my job! I have an obligation as a volunteer at Estafette because I asked for it. We up cycle furniture so that we can increase the likelihood of selling faster. Estafette is working with sustainability principles and therefore we embrace the idea of sealing the loop by avoiding waste. Some pieces of furniture may end up staying in the showroom longer if it was not pimped. We have verified that pimped furniture is usually in high demand and therefore sells faster. This has been confirmed by the sales output and observation in the showroom. Some customers literally follow the shop attendants when they realize that they are about to display the pimped furniture and ensure they acquire the unit that is about to be displayed, straight from the “pimp” workshop. There are some deal hunters who somehow keep an eye on these units.

Q. How do you select the items to be pimped?

Answer: We have access to a lot of old furniture that has been disposed by people for various reasons. We select what we feel can sell fast after up cycling using various techniques. I select furniture based on the different forms. I also discuss with my colleagues from the furniture department regarding what price can be paid before and after up cycling - I thereafter estimate the cost of up scaling and the competitive advantage that would be realized. We look at the year of manufacture, the style; bases on the legs curves for instance while considering tables and chairs, whether vintage or not. We also consider the motifs and the art forms on the units. We additionally consider the scratches, discolorations, stains and any other possible deformities. If we for example set a price at 50 Euros and then realize that the unit would only sell for 65 Euros, then there is usually no motivation to pimp the unit. I also consider the amount of effort required to upscale the furniture. A process such as sanding can transform the furniture to a big extent and add significantly contribute to the resale value.

Q. What kind of paints do you use?

Answer: We used water-based paint that is good for the environment. We consider that young children could lick and bite the furniture and therefore we have to keep it safe. We are lucky that we have a paint store nearby and can easily pick up the paint on very short notice. Estafette has an account with the paint store and we therefore do not have to purchase our requirements in cash. This is a convenient arrangement for us and we have to account for all the consumable by ensuring there is no waste.

Q. What skills are required to work in the furniture pimp department?

Answer: I am blessed with two hands for a start – I use them both in the job that I like! You need to push your creative brain. The Internet offers a great resource because there are many hobby enthusiasts who share many techniques online. You Tube has many short videos that can help in building up skills. There are blogs and numerous DIY writers who offer tips on how to accomplish results in many ways. You cannot overlook the Internet. Therefore, you can create things based on other people's designs and not exactly copying. Sometimes you do not have to re-invent the wheel but benchmark with others in the field. For instance, my colleague Peter has been to an art school and he is therefore very skilled in this field. He shares many tricks and it seems very easy when he performs a task. He knows what to do and he does it easily to perfection. There are many skills to be learned every day through practice and consulting amongst us. The most important is to keep trying out new stuff – Keep trying new ways. This is basically a process and therefore it is work in progress. It is more about creativity and being open to criticisms. Most times I look into the dumped furniture for motivation shapes, forms and texture. There is always something new to learn.

Q. What motivates the styles that you incorporate in the techniques that you use?

Answer: My style is mainly focused on sanding and faint brush stokes most times. However, I consult with my colleagues before settling on a specific style. We have to assess the piece of furniture before working on it. It is very easy to lose focus or overdo. A third eye is usually very important when restyling furniture. The fact that most furniture we have access to is already used informs us that the final output does not have to be worked on in precision. The buyers know that too. Most times we prefer a rustic look because the furniture is already old looking and we can age it further by use of specific techniques. This is referred to as distressing. It can be done through various colour application techniques.

Q. What tools are required in the pimp workshop?

Answer: A measurement tool is important. You also need a sand paper to smoothen the surfaces. You can sand by hand or using an electric sanding machine. You need various paintbrushes and rollers as well. Additionally, a scrapper is needed although you can improvise it – a sharpened piece of metal can be ideal or a well-handled broken piece of glass. Besides, you need a set of screwdrivers, and at times some spanners to undo furniture hardware (bolts, nuts and screws and other cosmetic fixtures especially on handle) that you may not want to paint over. However, at times I paint over if necessary.

Q. How long does it take to pimp a piece of furniture?

Answer: You can easily get something done in a couple of hours. At times it can take longer because you need to keep trying. You need to wait for the paint layers to dry too. Sorry I don't have a specific answer.

Q. Based on the pimp output, how much more does the final product sell for?

Answer: A pimped piece of furniture for example a set of stools that could have sold for 25 Euros can sell for 75 Euros after up cycling. Therefore the stools sell for 50 Euros more! The cost of material input could be 10 Euros or less. There is therefore a net of 40 Euros realized from the up cycling. This is a task that can be done in a few hours. It is therefore a win-win situation for the prospective customer, for me (as a personal achievement) and for Estafette because of earning more!

Q. What advice would you give to a new entrant into the furniture up-scaling field?

Answer: Do not get demotivated – keep trying! At times we have some sloppy output – you cannot always be perfect. Know what you want to do. Be creative. You do not need a lot of tools. Most tools can be improvised like it was done years ago. Learn and develop yourself and avoid making everything perfect. Let the pieces remain as vintage and natural as possible but a bit of restyling. We create similar vintage styles and sell affordably because our aim is to ensure that the furniture sells. We basically add value for a quicker sale and our prices are very affordable because we hardly incur any upfront costs in purchasing the furniture. The fact is that the furniture has already been discarded. Most of the units come from old grandma houses that are deceased and the next of kin do not need them for whatever reasons. We therefore have an advantage owing to huge supply all over the Northern Province of Friesland.

The agenda of the meeting at the prototyping and carpentry workshop

- Brief introduction of the researcher, with a clear discussion on the purpose and interest in the wood/carpentry workshop.
- The academic perspective of the circular economy was discussed in context of wood recovery from discarded timber or used furniture.
- The application of the circular economy principles in the carpentry workshop was discussed with a focus on the importance of a wood workshop as an enabler in a successful social enterprise that can repair, up cycle and repurpose furniture.
- The real-life application of the circular economy principles in practice at the carpentry workshop was suggested by Egbert so that the researcher could gain the full knowledge of what is required for effective running of a social enterprise that incorporates repairs of furniture.
- Amongst the products discussed were: how to make a wooden garden set, how to make a beehive and how to make a kitchen cabinet from recycled wood. After consultation with regard to time allocation for both the researcher and the carpentry expert, it was agreed that a beehive would be an appropriate project to work on. The beehive was nominated as a suitable project firstly because it would create an understanding of the use and application of hand tools, which is the most critical step to learn especially when working in a remote environment where electricity can be a challenge either due to scarcity or due to erratic interruptions. Additionally, hand tools are the most essential tools when undertaking minor repairs on used furniture especially on upholstery when need arises.
- The researcher was mandated with the task of searching online for appropriate beehive plans that could be used as part of the experiment.
- A work plan was agreed upon and the meeting ended after three hours.

The work plan

A work plan was discussed and agreed upon for implementation with a timeline of 2 months from **15 May 2017** to **15 July 2017**

- Introduction to other members of staff working at the carpentry workshop
- Review of beehive plans and a discussion on what quantities of wood use.
- Guidance on where to source and scavenge for scrap wood
- Elaborate review of workshop safety procedures
- An intensive introduction to hand tools
- The practical construction of the bee hive as an experiment

Review of bee-hive plans

This task involved searching online for existing beehive plans. There was emphasis on beehives that would work in the local circumstances in Kenya After an in-depth online research and review of bee keeping journals such as beesfordevelopment.org several beehive plans were identified. These are: the top bar Hive, the langstroth and the warre people's beehive. A detailed plan of the Warre people's hive was settled upon as a construction model. The settlement for this hive was for the purpose of a learning exercise

that would ensure observation of the ideal construction environment while assessing the use of hand tools in detailed cuts and sizing of wood. Reference plans for the construction of The Peoples Hive of Wabbe Emille Warre by David Heaf's plan was used as attached in Appedix 2 available online for download.

Precautions to consider before using a machine

The user should:

- Put on proper eye protection (safety glasses, goggles, or full face shield).
- Put on proper ear protection when operating any of the machines.
- Wear a dust mask or appropriate respirator when sanding, grinding, or sawing.
- Check to see if the machine is turned off before plugging it in.
- Check the condition of the machine. Are there any chips on the working surface or in any of the tracks?
- Check to see if the chip chutes are operable. Clean as necessary and make sure that the chute is open and that other chutes nearby are closed to provide the proper vacuum.
- Check the guard on the machine by moving it the full range of motion. If it sticks, lubricate it as necessary.
- Check blades. They should be replaced if they seem dull.
- Lift any heavy object carefully with proper technique.
- Check to be sure the operator and everyone in the vicinity is clear of the area in back of the machine. The blades could catch a piece of wood and throw it from the machine.

VRIJWILLIGERSCONTRACT

Naam:	Waweru James Kariuki
Adres:	van Sytzamastraat 11
Postcode	8933 DV LEEUWARDEN
Telefoon:	06-87877726
E-mail:	14-03-1977
Geboortedatum:	
Bankrekeningnummer:	n.v.t.
Kopie ID bewijs:	.

Algemeen
De vrijwilliger stelt zich uit persoonlijke motieven en onverplicht beschikbaar om vrijwilligerswerk te verrichten om de organisatie te ondersteunen bij het verwezenlijken van haar doelstelling, zonder aanspraak op een geldelijke vergoeding. Het is uitdrukkelijk niet de bedoeling van partijen om een arbeidsovereenkomst aan te gaan.

De vrijwilliger verklaart dat hij/zij bekend is met de notitie vrijwilligersbeleid van Omrin Estafette en een exemplaar heeft ontvangen of ter inzage kan lezen. Hij/zij kan zich verenigen met wat daarin staat.

De volgende afspraken zijn gemaakt tussen de vrijwilliger en Omrin Estafette:

1. Werkzaamheden
De vrijwilliger zal ten behoeve van bovengenoemde organisatie met ingang van:...30-5-2017 werkzaamheden verrichten op de afdeling: Pimp/ Hout De taakomschrijving wordt doorgesproken met desbetreffende leidinggevende.

2. Proeftijd en opzegtermijn
De proeftijd is 1 maand. Voor het einde van de proefperiode wordt zowel door Omrin Estafette als de vrijwilliger bekeken of de vrijwilliger werkzaamheden blijft uitvoeren voor Omrin Estafette. De vrijwilliger geeft hierbij toestemming aan Omrin Estafette om bij de betreffende gemeente een Verklaring van Goed Gedrag (VOG) op te vragen.

De overeenkomst is voor onbepaalde tijd aangegaan. De partijen kunnen de overeenkomst in onderling overleg beëindigen. Zowel de vrijwilliger als de Stichting kunnen de overeenkomst beëindigen. Omrin Estafette kan de overeenkomst direct beëindiging indien door de vrijwilliger is gehandeld in strijd met de bijgevoegde notitie vrijwilligersbeleid.

3. Werkdagen en –tijden

	ochtend	middag
maandag	X	
dinsdag	X Pimp	
woensdag	X Pimp	
donderdag	X Pimp	
vrijdag	X	
zaterdag		

4. Onkosten
De onkosten zullen eens per 4 weken worden vergoed op declaratiebasis. De vergoeding wordt na goedkeuring door de Stichting overgemaakt naar doorgegeven bankrekeningnummer. Contante uitbetaling is niet mogelijk. Indien er op verzoek van Omrin Estafette reiskosten worden gemaakt, dan kunnen deze gedeclareerd worden.

5. Praktische zaken
- Je bent op tijd aanwezig op de te werken dagdelen;
- Voortijdig afmelden bij verhindering;
- Zo snel mogelijk afmelden bij ziekte;
- Verlof altijd in overleg;
- Afspraken worden nagekomen;
- Er wordt niet gehandeld in strijd met de notitie vrijwilligersbeleid;

- Als je iets wilt kopen dan altijd laten prijzen door een leidinggevende. Ook als het gaat om goederen die in de afvalbakken zitten;
- Je aankopen ook altijd afrekenen bij een leidinggevende;
- Diefstal wordt niet getolereerd;
- Korting geven aan collega's of klanten is niet toegestaan;
- In de openbare ruimten van Omrin Estafette blijf je altijd klantvriendelijk.

6. Verzekering
De vrijwilliger is voor schade aan derden verzekerd middels een WA-verzekering. Tevens is voor de vrijwilliger een ongevallenverzekering afgesloten.

7. Begeleiding
Het inwerken en de begeleiding zal gebeuren door een aangewezen beroepskracht, namelijk:
.....

8. Integriteits- en privacy verplichtingen
De vrijwilliger is verplicht geheimhouding te betrachten over alle privacygegevens van de cliënten en houdt zich aan de bepalingen en reglementen van Omrin Estafette en de notitie vrijwilligersbeleid. Zowel de vrijwilliger als Omrin Estafette zullen deze afspraken nakomen.

Stichting Omrin Estafette

Naam: Gosse Jueral

Handtekening:

Plaats: Leeuwarden
Datum: 29-5-2017

Vrijwilliger

Naam: Wawern James Hendrikse

Handtekening:

Plaats: Leeuwarden
Datum: 29 May 2017

Informed consent form for individual interviews for thesis studies in MSc MEEM

Title research: Case study at Omrin Estafette : A practical case study on The operations of Estafette on how wood and used furniture is up-cycled and repurposed.

I declare to be informed about the nature, method and purpose of the investigation. I voluntarily agree to take part in this study. I keep the right to terminate my participation in this study without giving a reason at any time.

My responses may be used solely for the purposes of this study. In its publications, they may *(please tick one of the options):*

◉ be cited with my name or function revealed
O be cited anonymously, thus without identifying context
O only used as information source

During the course of the interview I keep the right to restrict the use of (some of) my answers further than indicated above.

Name participant: ..... Marianne Campens .....

Date: ..15 June 2017.... Signature participant: .....

I declare to fully adhere to the above.

Name researcher: **Kariuki Waweru**.

Date: **15 June 2017** Signature researcher: .....JKW.....

Informed consent form for individual interviews for thesis studies in MSc MEEM

Title research: Case study at Omrin Estafette : A practical case study on The operations of Estafette on how wood and used furniture is up-cycled and repurposed.

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My responses may be used solely for the purposes of this study. In its publications, they may *(please tick one of the options):*

× be cited with my name or function revealed
be cited anonymously, thus without identifying context
only used as information source

During the course of the interview I keep the right to restrict the use of (some of) my answers further than indicated above.

Name participant: Robert Spiekstra

Date: 15/06/17 Signature participant: Spiekstra

I declare to fully adhere to the above.

Name researcher: **Kariuki Waweru**.

Date: **15 June 2017** Signature researcher: jkw

Informed consent form for individual interviews for thesis studies in MSc MEEM

Title research: Case study at Omrin Estafette : A practical case study on The operations of Estafette on how wood and used furniture is up-cycled and repurposed.

I declare to be informed about the nature, method and purpose of the investigation. I voluntarily agree to take part in this study. I keep the right to terminate my participation in this study without giving a reason at any time.

My responses may be used solely for the purposes of this study. In its publications, they may *(please tick one of the options):*

× be cited with my name or function revealed
be cited anonymously, thus without identifying context
only used as information source

During the course of the interview I keep the right to restrict the use of (some of) my answers further than indicated above.

Name participant: Egbert Van der Mossel

Date: 15/06/17 Signature participant: Egbert

I declare to fully adhere to the above.

Name researcher: **Kariuki Waweru**.

Date: **15 June 2017** Signature researcher: jkw

Figure 4: Furniture manufactured from recycled wood at Estafette

Figure 5: A distressed piece of furniture with an aged look

Figure 6: The furniture upcycling studio at Estafette. The researcher worked under supervision in distressing the images herein

Figure7: The furniture manufacturing by the road side on Ngong Road, Nairobi
Photo credit : (Miti. 2010)

A lumberyard and workshop along Ngong Road. Despite its chaotic nature and poor equipment, it makes money.

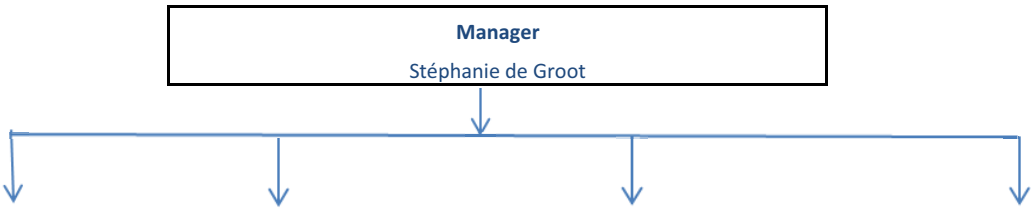
Figure 8: The furniture manufacturing workshop and timberyard along Ngong Road, Nairobi
Photo credit : (Miti. 2010)

Figure 9: A brief Process of salvaging wood from the dump, to repurposing wood into other functional products and upcycling as a finishing process

Figure 10: A brief process of salvaging wood from the dump, to repurposing wood into other functional products and up-cycling as a finishing process. Tools and discarded furniture

Figure 11: An open furniture manufacturing workshop and showroom along Ngong Road, Nairobi, Kenya

3. Organogram Estafette 2017



Stafbedrijf

Bedrijfsbureau
Louis de Groot
Gerdina Bijker

Project LWD
Metsie v/d Wal

Communicatie
Marianne Couperus

AFAC
Ronald v/d Haring
Ronald Bar

NHL
Mohammed Saaidi

Regio Zuid
Filiaalmanager
Yvon de Vries

Regio Noord
Filiaalmanager
Arjen Verhoeff

Filiaal Leeuwarden
Filiaalmanager
Sjoerd Seldenrust

Oosterwolde
Yvon de Vries
Jack Lamphen

Sint Anna
Arjen Verhoeff
Farid Sadid

Filiaalleider Productie
Gosse Overal
Fietsenwerkplaats
Timmerwerkplaats
Textielsorteer
Alie Triemstra
Anite Forrer

Burgum
Douwe v/d Ploeg
Sijtze Hoekstra

Franeker
Anneke Veenstra
Lieuwe Kloostra

Sneek
Andries Jan Hovinga
Wiebe Kooi

Harlingen
Jelte de Vries
Annelies Pander

Unitleider winkel/magazijn
Bennie Spekken
Winkel
Magazijn
Kleingoedsortering
Electrasortering

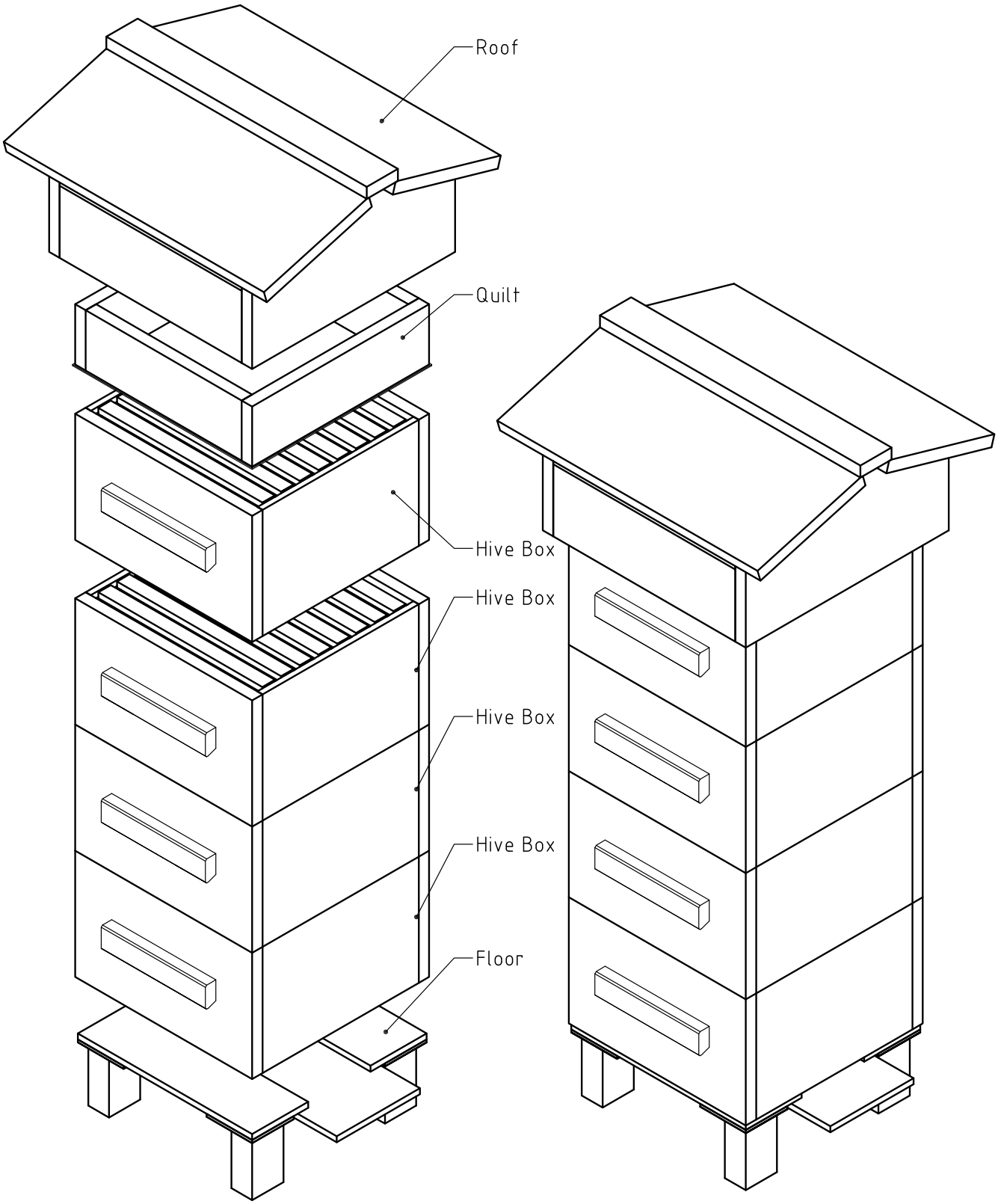
Unitleider Facilitair
Jannet Pathuis
Koffiecorner
Facilitaire zaken
Inkoop
Dienstkleding

Unitleider Logistiek & Magazijn
Jeffry Neijenhuis

Bee Hive Construktion Plans according to Emile Warré

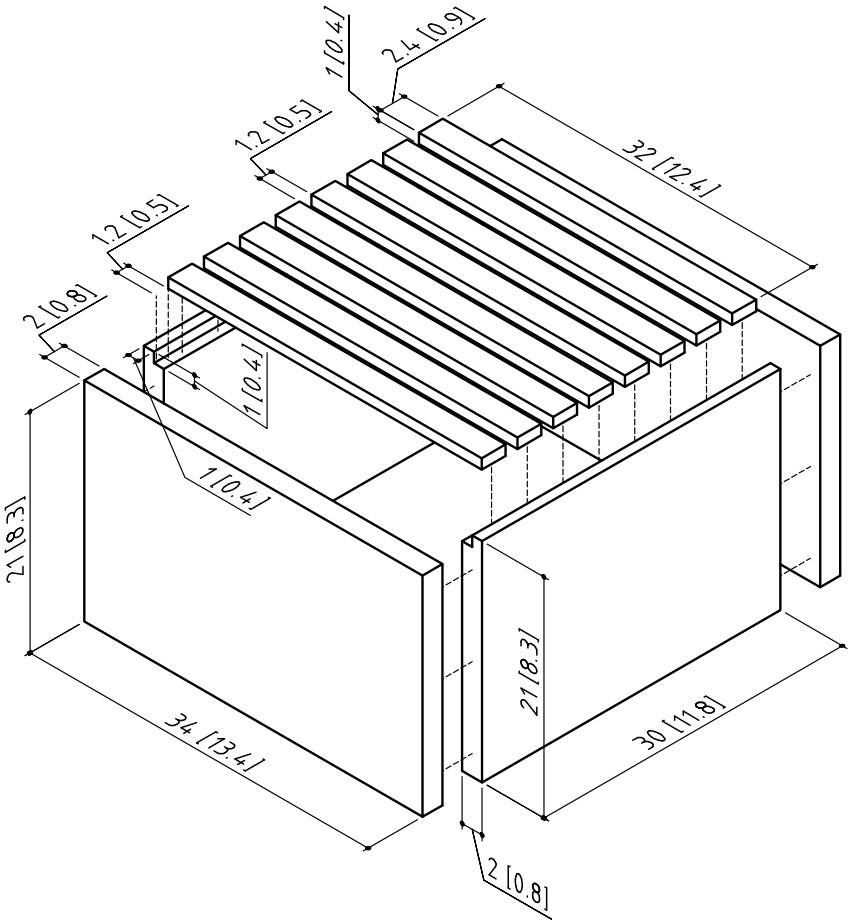
Diagram of the Complete Hive Assembly

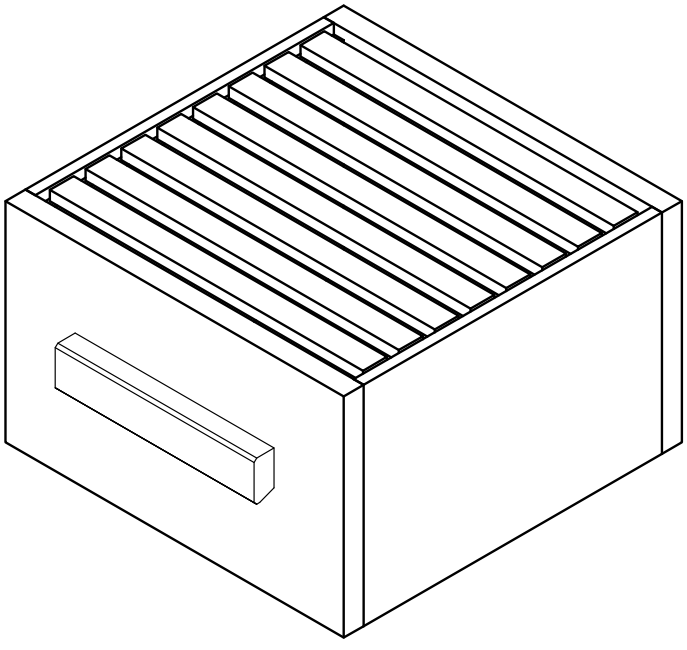
 -Measurements in cm [inch]-



Bee Hive Construktion Plans according to Emile Warré

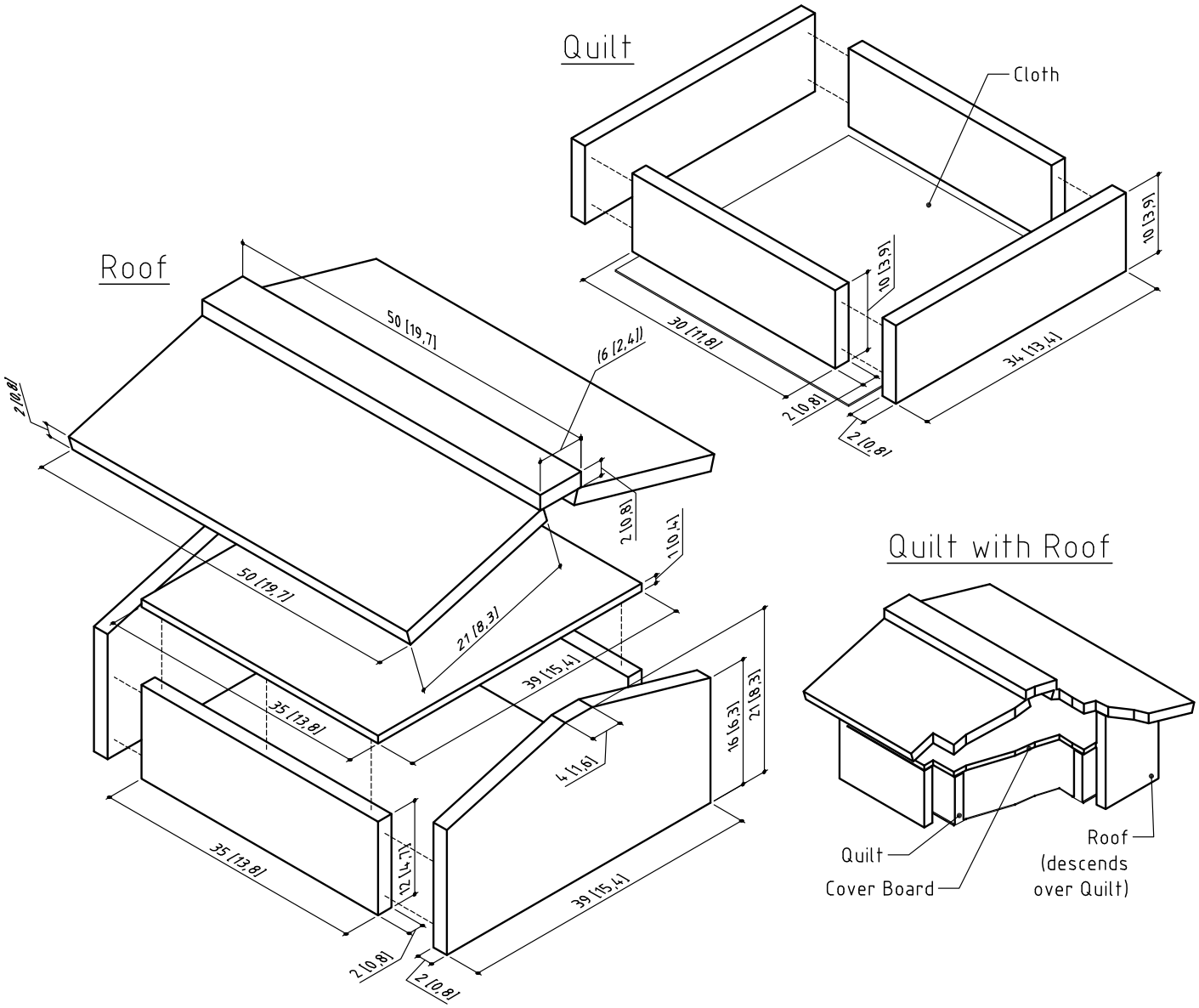
Diagram of Hive Box

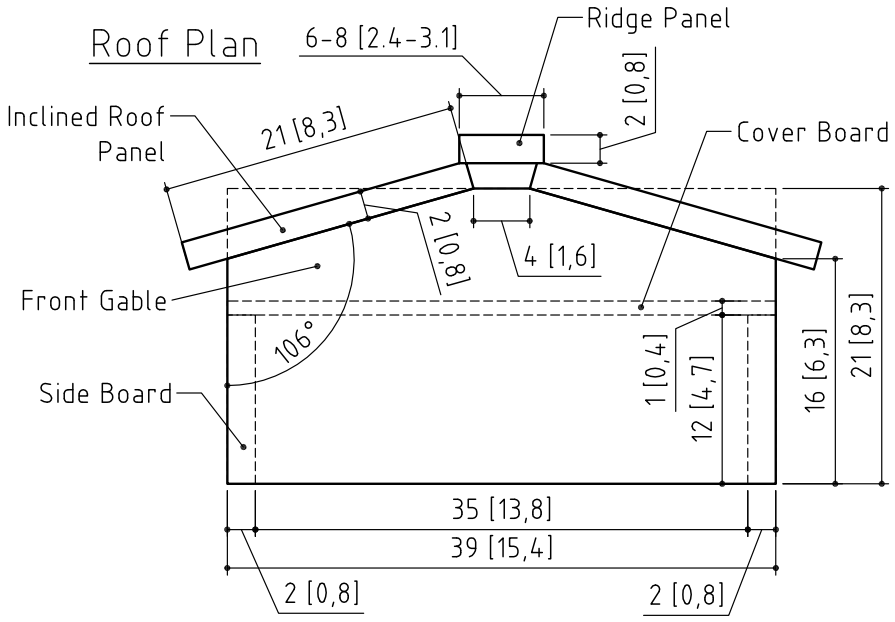




Bee Hive Construktion Plans according to Emile Warré

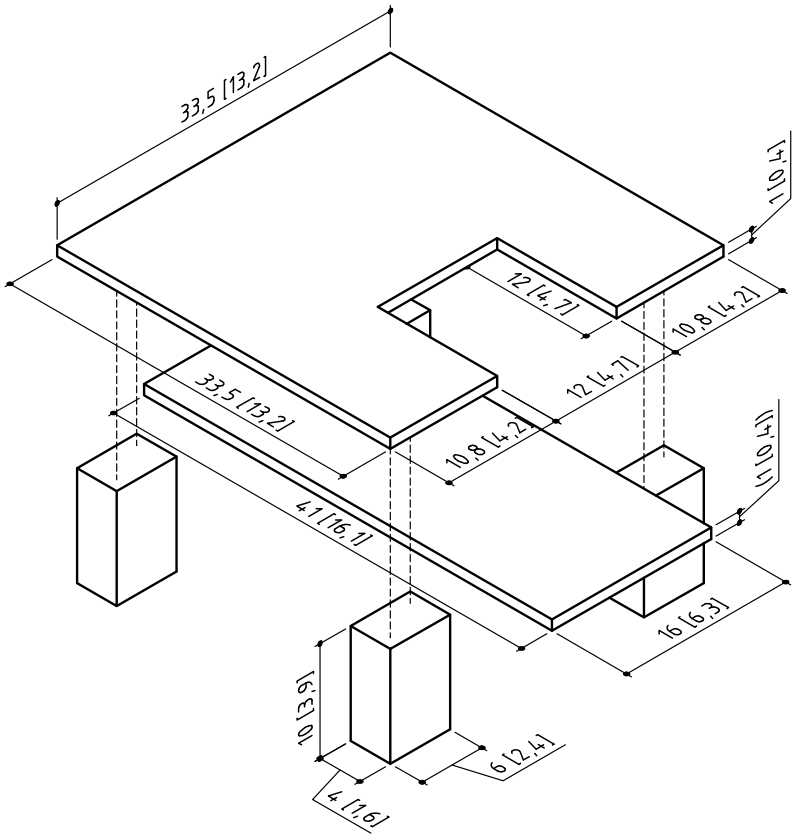
Diagram of Roof and Quilt

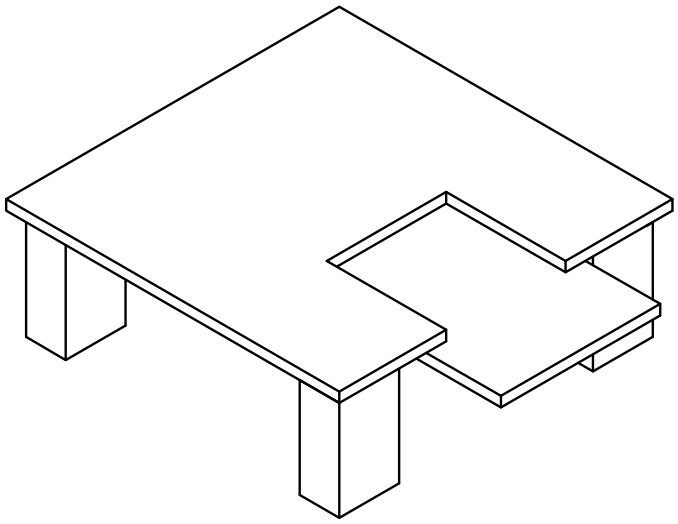




Bee Hive Construktion Plans according to Emile Warré

Diagram of Floor

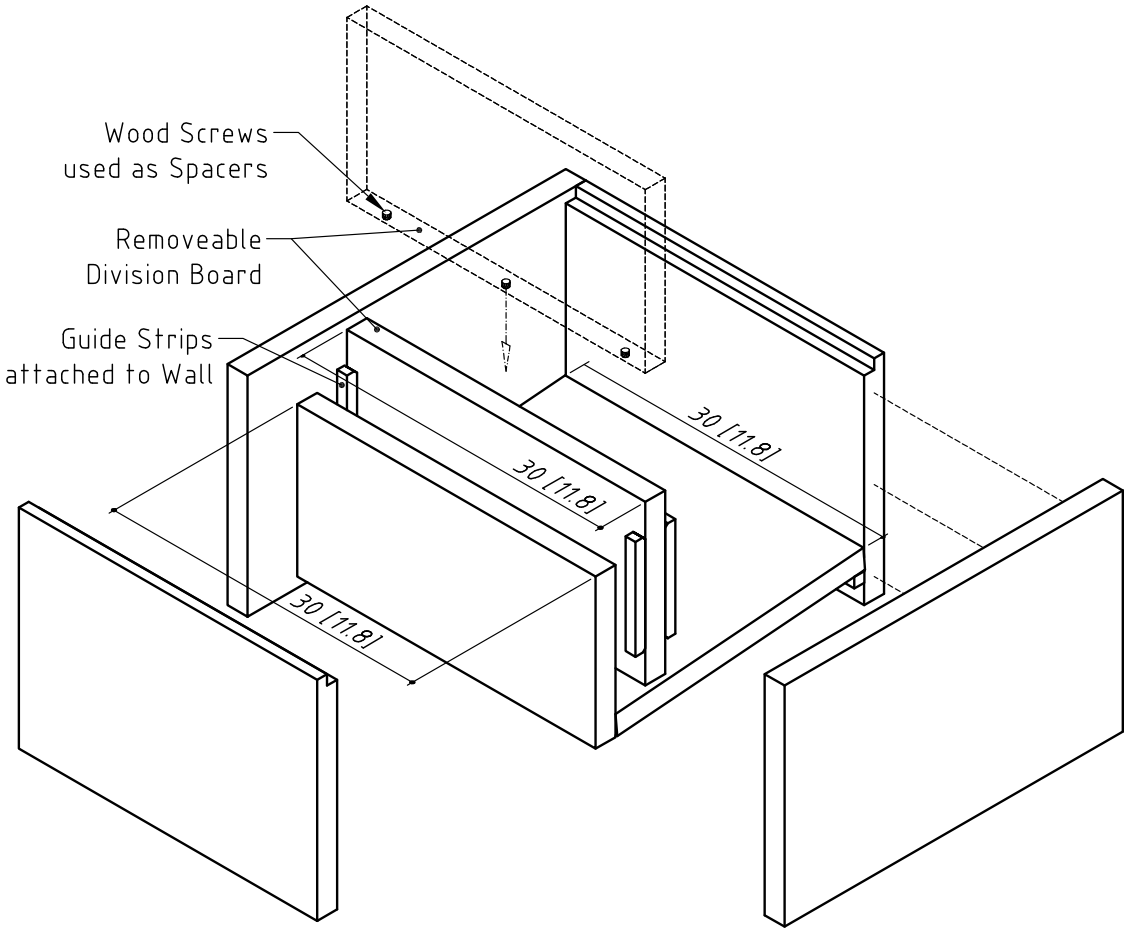


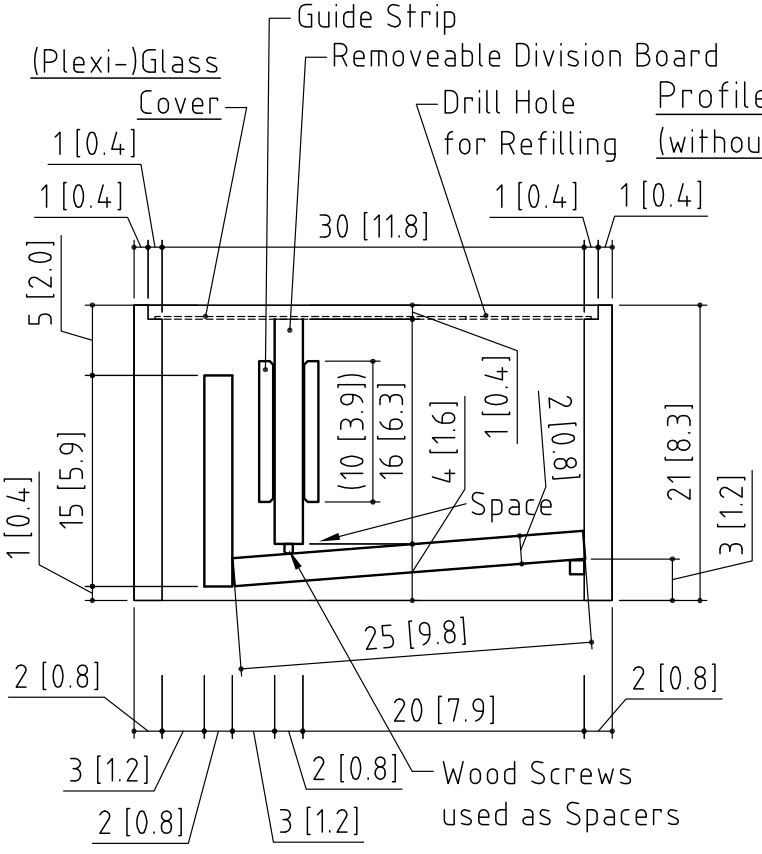


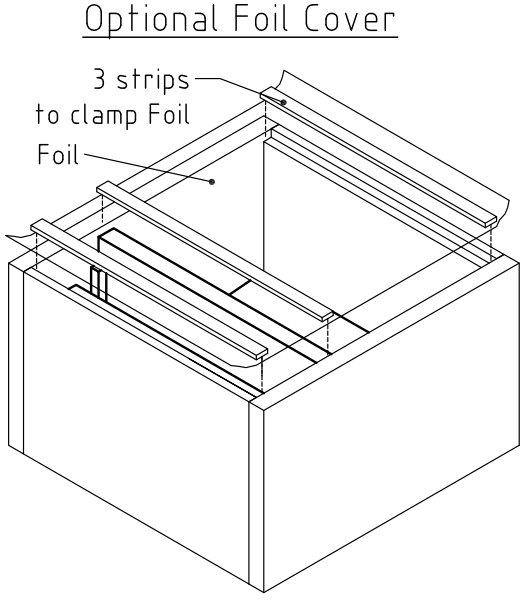
Bee Hive Construktion Plans according to Emile Warré

Diagram of Top Feeder

 -Measurements in cm [inch]-







Health and Safety Guidelines for Painting

In industry, the most popular method of applying paint is to spray it on, using compressed air, a high velocity airless spray or an electrostatic applicator. Paint can also be applied with brushes. The material itself is the primary hazard when painting. Painting may expose you potentially dangerous chemicals which may damage your health. This guide outlines some of the hazards associated with painting and provides information on how to work safely while painting.

Choose paint materials with safety in mind. Never use materials which are unlabeled their contents cannot be determined. Always follow the safety recommendations for the material being used.

Health hazards

Overexposure to a substance means too much has been breathed in, swallowed or absorbed through the skin. The possible effects of overexposure to paint and the chemicals it contains vary according to the type of paint. Some health problems caused by overexposure to paint material are:

- drowsiness;
- dizziness/light headedness;
- disorientation;
- nausea/vomiting;
- eye and throat irritation;
- dermatitis;
- general allergic response such as hives;
- asthma-like wheezing with tightness in the chest;
- heavy metal poisoning (lead, chromium, nickel and cadmium); or
- nerve, kidney or liver damage.

A wide variety of ingredients are used in paints and thinners. These chemicals are not found in all paints, but you have probably come into contact with some of them at one time or other. The following is a list of common ingredients of paints and thinners:

Pigments

- white lead
- red/brown iron oxide
- chromium oxide
- iron blue
- cadmium yellow
- lead powder

Solvents – thinners

- toluene

- ❑ xylene
- ❑ carbon tetrachloride
- ❑ perchloroethylene
- ❑ iopropyl alcohol
- ❑ cyclohexanol
- ❑ n-amyl acetate
- ❑ methyl ethyl ketone
- ❑ cyclohexanone
- ❑ methylene chloride

Resins

- ❑ isocyanates (contained in urethane resins)
- ❑ epichlorohydrin (contained in epoxy resins)

You may already be familiar with the paints you use regularly, but do you know their possible harmful effects? Ask for the Materials Safety Data Sheet (MSDS) (see below) for each paint. These are available from the manufacturer or paint supplier. The MSDS will describe the possible hazards and what precautions are needed. All of the above listed ingredients have standards for worker exposure.

Spray Painting Safety

Spray painting is a common and effective way to protect and beautify parts, products, vehicles, and buildings. Spray painting allows coverage of large areas with even coats of primer, paint, sealers, and other coatings. However, workers in spray painting operations need to recognize and guard against the hazard associated with spray painting processes.

Hazardous chemicals in coatings and solvents can enter the body several ways. Workers can inhale chemical vapors from spraying, absorb the chemical by skin contact or inject the chemical with high pressure spray painting equipment.

As proper ventilation is important when working with paint coatings, a spray booth is an excellent way to remove spray paint vapors and debris from a worker's breathing zone. Many coatings contain flammable substances that are aerosolized when sprayed through powered equipment and without proper ventilation, such as in a spray booth, these vapors can build up and create an explosion and fire danger. But to provide maximum protection, the spray booth must be properly maintained, including regular cleaning of filters and overspray. And to prevent sparking a flammable substance, smoking and other sources of flame near spray painting operations should be prohibited and tools should be properly rated and grounded for work in a spray painting area.

Because much of the equipment used for spray painting and surface preparation uses compressed air, workers should be aware that noise can be a risk, so should wear hearing protection when working with air powered tools.

How to Control Health Hazards

Following a few sensible rules can help to reduce exposure to chemical hazards.

Environmental Control

Whenever possible, painting or priming operations should be done in a spray booth or room. These areas have been designed to reduce exposure to paint vapors and additives – use them correctly. You should make sure that the ventilation in the spray booth or room is adequately maintained and working properly.

Before using the spay booth or room:

- ❑ turn on the ventilation system,
- ❑ check the spray booth filters and change if necessary, and
- ❑ turn on the make-up air unit.

When painting in an enclosed space (a room):

- ❑ provide outside ventilation air with fans or open windows,
- ❑ turn off ignition sources like wall heaters

When painting:

- ❑ follow the equipment manufacturer's instructions,
- ❑ avoid using plastic drop cloths on the floor (slip hazard)
- ❑ never point a spray gun at yourself or anyone else,
- ❑ position yourself so the piece you are spraying is between you and the exhaust fan,
- ❑ do not over spray, and
- ❑ use appropriate personal protection.

Personal protection

One positive step you can take to ensure continuing good health is to use personal protective equipment. Here is a brief description of some of the protective equipment available.

Respirators

Two types of respirators, the air-purifying and the atmosphere supplying, are commonly used in spray painting. IMPORTANT – you MUST use the correct type of respirator for the job being done and the chemicals being used.

The air-purifying type of respirator should be used only during exposure to those specific chemicals, or groups of chemicals, described on the respirator cartridge. These cartridges are good only for a limited time and must be replaced with new ones when:

- ❑ you can smell vapors in the mask,
- ❑ they become difficult to breathe through, or
- ❑ they have been used for their specific lifetime.

The atmosphere-supplying type of respirator must be used in some paint spraying operations, particularly with urethane paints or when painting in a confined space e.g. inside a tank.

REMEMBER — whichever respirator is used, it must FIT properly to ensure adequate protection (check the manufacturer's instructions). Respirator maintenance and cleaning is important. No one wants to use a dirty, leaky respirator which has been worn previously by someone else. Keep your respirator in good condition by cleaning and sanitizing it regularly. Store it in a clean place. Check it for pliability and signs of deterioration before you wear it. If the respirator needs repair,

use only the manufacturer's recommended replacement parts. With a little thought, and a small amount of effort, your respirator will protect you for a long time.

Eye and Hearing Protection

Without good eyesight you cannot do your job properly — so why risk eye damage, or loss of eyesight from solvent spray or splashing. Wear your SAFETY GOGGLES to protect your eyes from paint materials as well as the particulates created during sanding and grinding.

Some painting equipment such as grinders and compressors create loud noise. Hearing protection is required when noise levels exceed 85 db.

Protective clothing

Some of the chemicals you work with can injure skin or cause dermatitis. Coveralls and gloves prevent these chemicals from coming into contact with your skin, reducing the risk of damage. Wear your coveralls and gloves whenever working with chemicals. Clean your gloves and wash your coveralls regularly to prevent chemicals from accumulating, especially around the cuffs where they can easily come into contact with your skin. As an additional protective measure, use BARRIER CREAMS on your hands, face and neck. Check to make use you have the correct barrier cream for the chemicals being used.

Fire and explosion hazards

Because of the danger of fire and explosion where paints which contain flammable solvents are being used, care should be taken to remove all potential sources of ignition before starting work. This means naked flames, cutting and welding torches, gas fired heaters and materials which may give off sparks, whether electrical, mechanical, friction or static, and there must be no smoking. Make sure the correct types of fire extinguishers are available at the work site.

REMEMBER different types of fires require different types of extinguishers.

IMPORTANT: Flammable materials are required to be stored is flammable materials storage cabinets. Many Paint and solvents are flammable materials.

Dust and Preparation

Many painting projects require preparation of the materials to be painted. Preparation often involves sanding of the surface which creates a health hazard if dust masks are not worn. Ideally dust collection systems should be used to prevent large amounts of small particulates from entering the air.

Sanding and scraping of old paint may hold additional hazards if the old paint contains lead.

Things to do and not to do before painting

- ❑ **DO** Post "No Smoking" and "No Welding" signs
- ❑ **DO** Remove portable lamps and heaters from the area
- ❑ **DO** Make sure painting is done away from naked flames, sparks, non-explosion proof motors or any other source of ignition.
- ❑ **DO** Check the ventilation system to make sure it is on and working correctly.
- ❑ **DO** Electrically ground all spraying equipment

- **DO** Make sure approved respirator, eye goggles and any other protective equipment required for the job are worn
- **DON'T** Smoke
- **DON'T** Take more paint out of the store room than you can use in one day.

Material Safety Data Sheet

What is a Material Safety Data Sheet (MSDS)?

A Material Safety Data Sheet is a document that contains information on the chemical make-up, use, storage, handling, emergency procedures and potential health effects related to a hazardous material. The MSDS contains much more information about the material than the label on the container. MSDSs are prepared and written by the manufacturer of the material.

What is the purpose of an MSDS?

The purpose of an MSDS is to inform you of:

- The material's chemical make-up.
- The material's physical properties or fast acting health effects that makes it dangerous to handle.
- The level of protective gear you need to wear to work safely with the material.
- The first aid treatment to be provided when someone is exposed to the material.
- The preplanning needed for safely handling spills, fires, and day-to-day operations.
- How to respond to accidents.

What information is on the MSDS?

There are 9 categories of information that must be present on an MSDS. These are:

- Chemical Identity
- Health Hazard Data
- Manufacturer information
- Precautions for Safe Handling and Use
- Hazardous ingredients
- Exposure controls/personal protection
- Physical and chemical properties
- Fire and Explosion Hazard Data

Reactivity Data

Even with all of the above information on an MSDS, it might not have everything you need to know about a material. For example, health hazard information is usually presented in general terms. Your health and safety specialist should be able to help you find more information if it is needed.

Why is an MSDS hard to read?

Originally, MSDSs were intended to be used by industrial hygienists, chemical engineers and safety professionals. Now, MSDSs are used by employers, employees, emergency responders and anyone else requiring information on a material. Some MSDSs look very different from

others. This is because law specifies the content of the MSDS, but the format is left up to the manufacturer of the material.

When would I use an MSDS?

You should always know the hazards of a material before you start using it. For most people who work with a material, there are sections of the MSDS that are more important than others. You should always read the name of the material, know the hazards, understand the safe handling and storage requirements, and understand what to do in an emergency.

Hazard Communication Standard

MSDSs form the cornerstone of this standard. The Hazard Communication standard requires employers to; maintain an inventory of hazardous materials, provide employees training on the potential hazards associated with a material, obtain and maintain MSDSs for each material onsite, establish proper methods and types of labels, and inform contractors of the hazards that their employees may be exposed to in their work area.

Ladder Safety

Ladders are commonly used for painting. Ladder safety begins with selecting the right ladder for the job and includes inspection, setup, proper climbing or standing, proper use, care, and storage. This combination of safe equipment and its safe use can eliminate most ladder accidents.

Always check a ladder before using it. Inspect wood ladders for cracks or splits. Inspect metal and fiberglass ladders for bends and breaks. Never use a damaged ladder. Tag it "Defective" and report it to your supervisor/teacher.

When setting up a ladder, make sure it's straight and sitting firmly on the ground or floor. If one foot sits lower, build up the surface with firm material, don't set it on boxes, bricks or other unstable bases. Lean the ladder against something solid, but not against a glass surface. Make sure the ladder is placed at a safe angle, with the base away from the wall or edge of the upper level about one foot for every four feet of vertical height. Keep ladders away from doorways or walkways, unless barriers can protect them.

Keep the steps and rungs of the ladder free of grease, paint, mud or other slippery material. And remember to clean debris off your shoes before climbing. Always face the ladder when climbing up or down, using both hands to keep a good grip on the rails or rungs. Never carry heavy or bulky loads up a ladder. Climb up yourself first, and then pull up the material with a rope or bucket.

Many ladder accidents occur because of slipping or skidding. You can prevent these accidents by equipping the ladder with non-slip safety feet, blocking its base or tying it to a sound, permanent structure.

Overreaching is probably the most common cause of falls from ladders. A good rule is to always keep your belt buckle inside the rails of a ladder. Don't try to move a ladder while you're on it by rocking, jogging or pushing it away from the supporting wall.

When you've finished the job, properly store the ladder so it won't be exposed to excessive heat or dampness and will be in good condition for the next time.

Solvents

Solvents are so common in many work places that workers forget how dangerous they are. A solvent can be generally described as a substance, usually a liquid, that is used to dissolve

another substance. Although solvents can be used safely, health problems can result from skin contact with solvents or from inhalation of their vapors. In addition to the health hazards, many solvent vapors are flammable and explosive.

One of the most common health hazards associated with exposure to solvents is dermatitis. Contact dermatitis can develop from a single or from multiple exposures. It can leave the skin susceptible to a short-term infection or to a chronic condition. Exposure can also result in sensitization to the solvent, which is a delayed allergic reaction that often becomes more severe with subsequent exposures.

One big danger with solvents is that they can cause trouble before you realize what's happening. Depending on the type and concentration of the solvent, exposure effects can range from mild respiratory irritation to severe damage to body organs and systems. In extreme cases, overexposure to solvent vapors can cause respiratory failure and death.

When working with solvents, it's important to know what solvents are being used and what steps should be taken to protect against harmful or dangerous exposures. To optimize safety follow these suggestions:

- ❑ Know what solvents you're working with.
- ❑ Read the labels and the material safety data sheets of the solvents. They list the hazards, health effects, and safe handling procedures.
- ❑ Make sure the workspace is properly ventilated.
- ❑ Use recommended gloves, eye and face protection, boots, other protective clothing, or barrier creams as required.
- ❑ If respiratory equipment is used, make sure it gives appropriate protection for the exposure.
- ❑ Take care when pouring solvents from one container to another, as fire or explosions can occur from static electricity buildup.
- ❑ Clean up solvent spills promptly.
- ❑ Never wash your hands with solvents.
- ❑ Prohibit welding, cutting, soldering, and other sources of ignition in areas where solvents are used.
- ❑ Store flammable solvents in well-ventilated areas constructed of fire-resistant materials.
- ❑ Ground and bond all tanks and equipment for storage.
- ❑ Install readily accessible fire extinguishers in storage and work areas.

As with other toxic substances in the workplace, the preferred methods of hazard control are substitution of a less toxic substance in an operation, local exhaust ventilation, and enclosure.