An Assessment of Beauty Waste Management Practices: A Case Study of Rustenburg Beauty Salons

Ntswaki Marry Mokhethi: 1604511

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Supervisor: Professor Jasper Knight

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Declaration

I, Ntswaki Marry Mokhethi, declare that this research dissertation is my own unaided work. It is being submitted to the Degree of Master of Science in Geography and Environmental Studies at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted before for any degree or examination to any other University.

Signature: 

Date: 16 January 2024

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Abstract

The beauty salon industry is one of the fastest growing industries and is a significant waste generator in South Africa. Waste that results from beauty salons is a thorny environmental issue because it spans from different waste types and sources. Futhermore it requires waste treatment and different disposal methods. In view of this, this study seeks to assess waste management practices of beauty salons in Rustenburg, South Africa, in order to identify the types of waste salons generate and to identify recommendations that can assist beauty salons to be environmentally sustainable by improving their waste management practices. The aim of the research is to understand how beauty salon waste is discarded and to what degree beauty salon personnel understand the impacts of waste on the environment. The objectives of this research are to (1) determine the total amount of waste produced by selected beauty salons in Rustenburg, (2) identify the waste management practices undertaken by the beauty salons, (3) explore the challenges the beauty salons face in relation to waste management, and (4) identify recommendations of how beauty salons in South Africa can further improve their waste management practices.

This study employed a mixed methods design through quantifying the amount of waste the selected beauty salons generate over a two month period, and by interviewing salon personell on their views on salon waste and waste management practices. Fifteen salons were surveyed. Results were analyzed using thematic analysis. The results show that the all the beauty salons combined produce a total annual estimated waste of 4732.2 kg. Through interviews, the study identified waste management practices of the beauty salons to be primarily premised on discarding waste in dustbins for municipal collection, burning waste, or dumping waste in unregulated dumping sites when waste service delivery poses challenges. These three practices are the most common modes of waste disposal in the Rustenburg beauty salons. Issues of waste management facing beauty salons includes lack of waste facilities and lack of knowledge about waste management. The major recommendation from beauty salons and civil (professional) organisations was for government to provide beauty salons with better infrastructure for waste sorting, recycling, pick-up and disposal. Promotion of good practice and awareness campaigns were cited as recommendations to improve waste management practices in beauty salons.

Keywords: Waste management, Beauty salons, Environmental management

Chapter 1: Overview of the study

1.1 Introduction

Beauty has different meanings to different people hence a well-known expression is that "beauty is in the eye of the beholder" (Eco, 2004; Prettejohn, 2005). Beauty salons are tasked to supply personalised beauty services to various clients amid the complexity of what beauty is perceived as, in accordance with various beauty industry standards (Planko *et al*., 2016). According to Eco (2004), beauty has many expressions premised on something that an individual is fond of and indulges in for personal fulfilment. In the process of rendering beauty services, waste is inevitably produced from the products used to enhance and create beauty through the application of a wide range of different treatments. Some treatments may involve the utilisation and generation of potentially toxic or hazardous waste which may result in air and water pollution (Curran and Williams, 2012). Sustainable waste management practices in beauty salons is an important aspect in ensuring a balance between beauty needs and environmental sustainability.

It is therefore important to understand what is referred to as " waste management practices" in the context of this research. The definition of waste is not homogeneous across countries, however it is premised on unwanted and discarded material with no value to the user (Oelofse and Godfrey, 2008). Waste management refers to the various methodologies intended to handle, dispose or treat waste. The primary objective of waste management is to reduce the quantity of waste which is destroyed and increase the quantity of waste that can be converted into beneficial resources and uses. This research will therefore look at the actions or practices that salons habitually undertake in their daily routine when handling different types of waste.

This study will conduct an assessment of beauty waste management practices in Rustenburg in order to contribute to the body of knowledge that aims to understand the relationship between the environment and waste management in the beauty industry. Different types of waste exist in society, which include industrial, household, organic, biomedical and radioactive waste. Waste exists in different states such as solid, liquid and gas. Each sector of society has regulated methods of waste disposal and waste management protocols (Adeleke *et al*., 2021). A focus

will be placed on waste that is produced by beauty salons which can be classified according to its chemical and physical properties. Beauty salons produce waste such as hair, hair dyes, bleaches, hairstyling gels, weaves, shampoo containers, peroxides, brows, eyelash tints, wax solvents, nail enamels, acrylics and gel systems, nail polishes and polish removers as well as hair disinfectants (Brouwer *et al.*, 2023; Keretetse *et al*.,2023). The ingredients used in beauty salon products and therefore their waste products are paramount to understanding how their waste should be managed and disposed of. The ingredients in most salon products are safe to apply on human skin as it poses little or no risk in the short term, however some ingredients can enter the human body through inhalation, ingestion and internal use, resulting in unintended health challenges linked to cancer and neurological harm (Ukpong and Udophia, 2011). Human beings are socially adaptive species and a part of us yearns to be validated by broader society and the beauty industry reinforces that validation.

1.2 The background to the South African beauty salon industry

The South African beauty industry is diverse. The industry is a host of the formal sector characterised by registered beauty salon businesses, some of which are popular franchises across the length and breadth of South Africa with formal employment structures (Keretetse *et al.*,2023). On the other hand the salon industry hosts the informal sector consisting out of beauty salons that are not registered and are notorious for irregular working hours and unstable wages (Keretetse *et al.*,2023). The beauty salon continues to grow nationally in South Africa and contributing to employment opportunities. According to Intelligence (2023) the South Africa Beauty salon market is estimated at 467.31 million dollars in 2023, and is expected to reach 630.69 million dollars by 2028. The growth rate is estimated at a Compound Annual Growth Rate (CAGR) of 6.18% during the forecast period between 2023 to 2028.

There is a demand for beauty salon treatments that assists to stimulate hair growth , prevent scalp damage and control curly hair and other unique hair challenges. The high number of commercial promotions in South Africa motivates consumers to render more salon services and use beauty products distinguished for luxury and beauty. Celebrities and influencers in South Africa are key to promoting the high consumption of beauty services and products. This is exemplified in July 2022, when Boity Thulo, a popular South African television star, launched her haircare brand in collaboration with the South African brand Front Row Hair (Intelligence, 2023). The natural hair movement in many regions of South Africa has also

contributed significantly to the beauty salon market increasing and using more environmentally friendly products. The utilisation and promotion of chemical-free organic products are at the heart of the natural hair movement. South Africa enjoys a the preference of a variety of beauty hair treatments such as braids to weaves, to chemical treatments, to other physical styling methods as part of embracing the rainbow nation aspirations (Intelligence,2023). The natural hair movement has revolutionize the haircare industry in South Africa with beauty salons opting for more natural products with ingriedients such as aloe-vera, shea butter, buriti oil, and chebe powder. In December 2021, natural and organic skincare brand Uhuru Botanicals introduced Chebe Hair Shampoo and Chebe Hair Conditioner bars as part of their commitment to natural product. Nail care service forms part of services rendered in beauty salons in South Africa (Intelligence,2023).

The growth of the beauty salon industry positions the beauty salon market as one of the largest in Africa and a market which attracts investments (Diagonal Reports, 2011). South Africa has limited studies about the beauty salon industry, however, the growing salon market will drive more research being conducted, and this can contribute to filling this research gap (Wojciechowska *et al*.,2019; Diagonal Reports, 2011). The emerging trend of beauty hairstyles at every corner of the Central Business District (CBD) in South Africa is also a growing market. South Africa's consumer spending on beauty and hairstyles tends to be extravagant, especially among young adult and female consumers (Wojciechowska *et al*.,2019; Diagonal Reports, 2011). Social media and fashion events such as the Durban July have placed beauty and a career in the beauty industry as a viable option for many people (Intelligence,2023). Hairdressers, nail and beauty technicians play an integral part of this growing market. Beauty salons are considered as the home of beauty, and this places a spotlight on its environmental and sustainability practices (Keretetse *et al*.,2023).

Beauty salons provide diverse benefits which cannot easily be done by people at home as often hair and beauty professional styling requires skills, talent and experience. Beauty salons offer a range of beauty therapy and technical services ranging from hairdressing to nail treatments (Garbaccio and Oliveira, 2013). Beauty services involve any procedure aimed to reinforce, maintain and alter personal appearance. In the process of rendering these services, waste becomes an ultimate by-product which poses a challenge to major beauty brands as the industry expands. The increasing middle class population in South Africa affords beauty consumers with the opportunity to interact with salon environments for their daily beauty needs (Udeagha

and Muchapondwa ,2023). Beauty product manufactures are also keeping up with these trends and are addressing mounting concerns facing the industry with regards to post-consumption waste of beauty products and services. Campaigns such as the natural hair movement are key to the success of the beauty salon industry as it ensures beauty brands are required to show environmental compliance as a criterion to qualify for investment opportunities (Keretetse *et al*.,2023). The South African beauty industry plays a crucial role in society not only because it influences and impacts the way people perceive and feel about themselves and others, but also because it contributes to job creation and economic growth (Wojciechowska *et al*.,2019;) Udeagha and Muchapondwa,2023). The environmental impacts of some beauty products are well-documented and more beauty salon brands are gravitating towards recycling of beauty product packaging or refilling of beauty cosmetics and sprays however, there is still limited understanding of the types of waste beauty produce (Diagonal Reports, 2011).

The South African beauty market has therefore realised it is crucial when operating a beauty establishment to think of the responsibilities that will come with safe waste disposal (Diagonal Reports, 2011). Most of the beauty waste is disposed in landfills while a negligible quantity of waste is reused, recycled and recovered back into the economy **(**Cubas *et al*., 2020). Hazardous beauty waste products such as hair cream and sprays can impact negatively on both the environment and the beauty brands which is also noted by concerns of beauty clients. There is therefore a trend of clients in the South African beauty salon market towards more sustainable beauty products and salons. Local beauty salons are now experiencing a growing market for cosmetics formulated with natural and indigenous ingredients (Lowe, 2016; Donahoo, 2019). The number of cosmetic formulations for home treatment has also increased and this is evident in South African beauty consumers sharing on social media recipes of beauty products made up of everyday ingredients. The trend is leading to the development of new brands and beauty salons losing out on profits as a result of using environmentally unsustainable products (Wojciechowska *et al*.,2019).

Beauty salon practitioners are now responding positively to calls for transforming the beauty industry into one that is known for positive environmental contributions. Futhermore, the beauty salon client base is increasingly male as men are becoming more fashion and health conscious (Diagonal Reports, 2011). Beauty salons now advertise and apply male-orientated grooming products on male clients. Therefore, an innovative and integrated approach is needed in the South African market for thinking what waste is and how it can be converted into

opportunities for economic growth (Bdour *et al.*, 2007). This research aims to understand how waste is discarded or managed in beauty salons. This study is essential as it provides the opportunity to understand how waste may be converted into recycling and recovery innovations. When beauty salon waste is not appropriately managed, segregated, transported, and disposed of according to legislative guidelines, it can detrimentally affect the environment and public health, as well as being more costly (Abor and Bouwer, 2008; Clarke, 2008).

In view of the above-mentioned challenges, this study seeks to assess waste management practices in the beauty salon industry, using the case study of selected Rustenburg beauty salons, and then to identify recommendations for better salon waste management practices that are applicable nationally. The negative impacts of waste on the environment necessitates that beauty salons develop awareness of their waste outcomes and to ensure legal compliance (Hood, 2002; Oelofse, 2008). The Waste Management Act (No. 59 of 2008) in South Africa classifies several commonly-used beauty products as hazardous waste (Garbaccio and Oliveira, 2013; Ssempebwa *et al*., 2019). Waste management in the beauty industry is therefore a thorny issue because there are regulations that salons need to comply with when dealing with hazardous salon waste (Bdour *et al*., 2007).

1.3 Problem statement

South African Beauty salon market is estimated to reach 630.69 million dollars by 2028. The understanding of current practices of waste management in beauty salons is necessary to contribute to accurate environmental decisions that can lead to more sustainable practices (Intelligence, 2023). Hair and nail products after usage ultimately end up as waste to be discarded. Historically waste is disposed of without consideration of its impacts on the environment and public health (Godfrey and Oelofse, 2017). The increasing demand for beauty treatments is accompanied by increased waste generation in the beauty salon industry. Beauty product manufactures are now obligated to produce safer and organic alternative beauty products that can contribute to environmental sustainability. Beauty salons are also compelled to comply with stricter hazardous waste regulations as the interest in product quality and safety issues of beauty products has grown (Dimitrova *et al*., 2009; Brouwer *et al*., 2023). Beauty salons are encouraged to consider organic beauty salon products that are free from hazardous chemicals such as parabens. A lack of understanding of the environmental impacts of beauty salon waste is manifested in harmful substances being discarded in rivers and natural vegetated

land, negatively impacting the environment and its ecosystems. The concern of the beauty industry's impact on the environment is growing and neccessitates for research on effective salon waste management (Cheng *et al.*, 2009). A paradigm shift is required which considers other alternatives of waste disposal other than landfill. Resorting to landfill remains the most common method of waste disposal by waste generators, including beauty salons. The management of landfills has a focus on burying waste to eliminate odours and danger to the public (Friedrich and Trois, 2013). Moreover, landfill management is associated with the presence of methane and other landfill gases, both of which can result in contamination to the surrounding environment. Landfill toxins infiltrate the soil to the groundwater table which eventually can contaminate domestic water supplies. Landfill waste destroys adjacent soil and land through toxic chemicals infiltrating into the soil (Friedrich and Trois, 2013). As much as landfill remains the common method of waste disposal, it is not the only method of waste management .Regulators realise that the lack of landfill space in South Africa necessitates a different approach to waste management (Godfrey and Oelofse, 2017).

1.4 Research aim

The aim of the research is to understand how Rustenburg beauty salon waste is discarded and to what degree beauty salon personnel understand the environmental impacts of waste on the environment.

1.5 Research objectives

1. To determine the total amount of waste produced by selected Rustenburg beauty salons,
2. To identify what the waste management practices are in the selected salons,
3. To identify and explore the challenges that beauty salons face in relation to waste management,
4. To identify recommendations of how beauty salons in Rustenburg , South Africa can further improve their waste management practices.

Chapter 2: Literature Review

2.1 Introduction

This chapter will provide an overview of the literature that relates to beauty and waste management as a concept, which is well-documented globally and in South Africa. The literature will map out the major themes that frame the aims and objectives of this research study. The literature review will explore the legislation that governs waste management in South Africa. Legislation forms the basis for how beauty waste should be handled and managed, considering the environmental impacts of beauty products. The literature review will then look at the nature of beauty salon treatments and services to review what is done within beauty salons in terms of waste production and management. This aligns with objectives one and two of this study. The literature will furthermore identify different types of hazardous beauty waste. Navigating different types of waste (hazardous or non-hazardous) can be challenging and therefore objective three of the research explores the challenges that beauty salons face in relation to waste management. A review of beauty waste during different stages of manufacture and consumption will be presented, and the environmental issues encountered in these stages. These industry challenges will contextualise the recommendations in line with objective four in this study. Recommendations will be reviewed from the perspective of nail, hair and hygienic practices that salons can adopt as a path towards environmental sustainability. The literature also highlights the role that civil and professional organisations can play to assist beauty salons to better understand waste management and disposal.

2.2 Overview background of beauty salon and waste management in South Africa

According to the Services SETA (2014), an estimated 73% of all businesses in the hairdressing are under Small-Medium Enterprises (SMEs).There are environmental challenges which results from the poorly managed beauty salon waste characterised by chemicals from hair products. There are a myriad of accounts as to the reasons the beauty salon industry is observed to practice poor waste management. It may be as a result of the permeable legislative barriers to entry and high levels of competition, which has the effect on the revenue of various beauty salons. The size and shape of the beauty salon labour market has not been researched enough in South Africa (Intelligence , 2023; Udeagha and Muchapondwa , 2023). There is a data deficit

in terms of the exact number of beauty salons operating in South Africa and it is challenging to conduct the research and salons close and open often without any records to account for closures and reopenings. As a result, the beauty industry being characterised by a high level of closures and reopening waste management accountability that lies which the salon management is not enforced accordingly (Services SETA, 2014). There are a significant number of individuals currently operating beauty salons in the informal sector and migrate seasonally leaving with waste products for the local government to clean up. Another challenge is that employees in the informal sector are not recorded so it becomes a challenge to tract the employees that must exercise accountability for practicing poor waste management in beauty salons (Services SETA, 2014).

It is important that beauty salons are monitored throughout South Africa. The role of beauty salons and beauty is integral to physical image, whether beauty is expressed in clothing, hair or nails as a means of self-expression. Consumers of beauty products of all ages, genders, cultures and socioeconomic levels have their hair cut, styled, dyed or adorned, either at home or at a beauty salon. Hair and nail consumers are demographically diverse and this reflects the diverse meanings of beauty and the role of beauty salons in society (Abila and Kantola, 2019). Beauty salons as waste generators need to be engaged in managing waste from its inception to its final disposal. The science of beauty is integral to understanding beauty salon waste as it can influence the collection, transportation and disposal of recyclable, non-recyclable, hazardous and non-hazardous waste (Zeng *et al*., 2016). Programmes are required to make the beauty industry more aware of the nature of beauty treatments as well as the ingredients contained in beauty products. Beauty salons are also required to monitor and promulgate waste management practices that deal with the detrimental impacts of beauty waste on the environment .

2.3 Waste management legislative framework in South Africa

The Constitution of South Africa has progressive requirements regarding the collection, handling, transport, and treatment of waste (Strydom and King, 2009). The Constitution in the Bill of Rights under Section 24 asserts the right to an environment free from adverse environmental impacts (Du Plessis, 2008). Du Plessis (2008) states that the Constitution establishes a base for environmental legislation in South Africa and assists environmental policies such as White Papers on waste management and the National Environmental Waste

Act (No. 59 of 2008) (NEM:WA). Figure 1 indicates the legislative framework of waste management in South Africa. It indicates that the foundation of all waste management laws in South Africa is based on the Constitution and the National Environmental Management Act (No. 107 of 1998) (NEMA). NEMA then led to the NEM:WA which guides all waste management practices across all industries including the beauty salon industry. NEM:WA is supported by various sectorial acts such as the National Biodiversity Act (No. 10 of 1996). These are then supported by various provincial and local bylaws. The legislative framework is what gives impetus to the promulgation of laws and regulations aimed to reduce the mismanagement of waste and its impact on the environment

Figure 1: Waste management legislative framework (Source: DEA, 2011)

2.3.1 Waste management laws and guidelines

The state and its organs are mandated to uphold, protect, and promote environmental rights. NEM:WA provides the foundation of a multidisciplinary legislative framework which seeks to regulate waste management issues in South Africa (Hood, 2002, DEA, 2011). It encapsulates aspirations of the waste management strategy which seeks to convert waste into resources before disposing of it when it has exhausted its life cycle (Wills *et al*., 2016). NEM:WA sets the foundation for the provision of national norms and standards. NEM:WA assigns clear tasks and responsibilities for waste management to all relevant stakeholders. The successful execution of some tasks may be enhanced by collaborative efforts between government, communities and the private sector. Beauty federations and civil organisations aid government in enforcing compliance to maintain waste management standards in the beauty industry (Rambe and Mpiti, 2017). These organisations include the National Bargaining Council for Hairdressing, Beauty, Cosmetology and Skincare Industry South Africa, The National Beauty Federation, The Federation of Holistic Therapists, Cosmetic Executive Women and The Employers Organisation for Hairdressing, Cosmetology & Beauty. They also participate in government approaches to promote environmentally sound waste management practices (Bilal *et al*., 2020, Mishra *et al*., 2020).

The role of civil organisations and federations is to primarily facilitate agreements between government, trade unions and employer organisations. Organisations such as the National Bargaining Council draws its statutory mandate from the South African Labour Relations Act (No. 66 of 1995) which is a legislative framework which guides all businesses in South Africa. Public participation is key to ensuring good governance in the beauty salon industry (Ratsibe, 2010). Civil organisations provide the legislative forum where salon waste management issues can be discussed and where collective agreements can be adopted. Moreover, the organisations together with government promote fair and impartial enforcement of the agreed terms of conditions of employment (Ratsibe, 2010; DEA, 2011). In addition to working with civil organisations to solve waste management challenges, government at a local level introduces bylaws such as the Barbers, Hairdressers and Beauticians Act (No. 108 of 1996) (DEA, 2011). Moreover NEM:WA provides a framework for beauty industry organisations to promote waste management principles such as the precautionary principle, polluter pays principle and waste life-cycle approach (DEA, 2011). It also embeds a duty on waste producers to institute measures to prevent waste from reaching landfills without considering other waste management options (Gertsakis and Lewis, 2003). Furthermore, it places a duty to waste generators to enforce measures where waste generation cannot be prevented (Wills *et al*., 2016). The Act sets provisions for all relevant stakeholders to assume reasonable measures to implement the waste management strategy at all times (Oelofse and Godfrey, 2008). A hybrid and multidisciplinary approach to addressing waste challenges is required to ensure that waste management activities deal with waste challenges in a coordinated and cooperative manner (Gertsakis and Lewis, 2003; DEA, 2011). Provincial and local government may additionally develop norms and standards on other matters which pertain to their jurisdiction in addressing waste challenges, however it should not be in conflict with nationally established norms and standards (DEA, 2011). The norms and standards must also be in harmony with other various sectorial legislation such as the National Environmental Management: Air Quality Act, 2004 (DEA, 2011).

A multidisciplinary approach is also promoted where various government departments work together to address waste issues which are intersectoral in nature, such as waste in public spaces. This requires implementing different sectorial legislation in conjunction with each other (DEA, 2011). Local government must provide waste management services, which include waste removal, storage and disposal services, as per Schedule 5B of the Constitution.

Municipalities must work with industry and other stakeholders to extend recycling at the municipal level. Municipalities must provide additional bins for separation at source, and are responsible for diverting organic waste from landfill and composting it. Municipalities must facilitate local solutions such as Material Recovery Facilities and buy-back centres, rather than provide the entire recycling infrastructure themselves. At their discretion, municipalities may set local waste service standards for compacting, management and disposal of solid waste. Local standards must be aligned with any provincial and national standards where these exist. Similar to local government, there must be a provincial waste management officer responsible for coordinating waste management matters.

The Waste Act empowered by NEMA has a progressive legislative framework for conducting Environmental Impact Assessments, in the procedures for issuing licenses for waste management activities. Salons need licenses to partake in waste activities especially of hazardous salon waste such as acetone. Although the primary focus of this study is on beauty salon products, this does not ignore other forms of waste found in landfills that have a source in beauty salons. Figure 2 corroborates with literature highlighting the impact of landfills on the environment.

Figure 2: Beauty waste in waste dumps (Source: Google, 2023)

These reasons place a need for all stakeholders to be concerned about waste management, including the beauty salon industry. Beauty salons can contribute to society through proper waste management practices (Godfrey and Oelofse, 2017). Although waste cannot be avoided completely, beauty salons should adopt eco-friendly practices of reducing and reusing waste. The Polokwane Waste Declaration of South Africa had a goal to stabilize waste and reduce

waste generation. The reality is however that more waste is disposed of in landfills than is recycled in energy and resources (DEA, 2011).

To address waste stream challenges, government has developed mechanisms to accomplish waste management goals contemplated in the Waste Management Strategy (DEA, 2011). The mechanisms include a waste classification and management system which acts as a methodology of classifying waste at landfills. Norms and standards are the regulatory framework for regulating waste lifecycles according to the waste management hierarchy (Oelofse and Godfrey, 2008). Industry waste management plans place an obligation on waste management programmes for their respective industries as a measure to comply with governmental regulations (DEA, 2011). Extended Producer Responsibility enforces the responsibility of waste generators to safely discard waste beyond the point of product use (Nahman, 2010). Priority waste identifies different categories of waste which require additional measures for disposal, based on the level of risk of the waste in question. Economic instruments are enforced through fines and penalties for non-compliance and thus discourage improper waste behaviours (Nahman and Godfrey, 2010). Instruments such as voluntary, civil, and agreement-based approaches are used to encourage responsible waste management (DEA, 2011). To mitigate the adverse impacts of waste, a waste management strategy used should consider waste reuse, recycle, recover, treatment and disposal (Matete and Trois, 2008). Not all waste can be recycled or recovered, however, such as hazardous medical waste (Bdour *et al*., 2007). Moreover, waste management has crucial commercial and financial implications pertaining to collection, treatment, disposal, and transportation requirements, for both industry and government.

2.4 The nature of beauty salon treatments and services

Hair and nail technicians spend their working days providing hair and nail care services, which include hair relaxing, manicures, pedicures, hair dying, hair wash, ultra-violet (UV) gel and acrylic nail applications. These hair and nail applications utilises a wide variety of products consisting out of a cocktail of chemical substances (L'Oreal Groupe, 2016; Keretetse *et al*.,2023). Nail chemical products include nail polishes, nail polish removers, nail hardeners, artificial nails, nail tip adhesives, artificial nail removers, and disinfectants . Hair chemical products includes hair creams, hair dyes and hair food. Chemical substances in the hair and nail products are typically aromatics hydrocarbons such as toluene, ethyl benzene, xylene,

aldehydes ,esters butyl acetate, vinyl acetate, methyl methacrylate , ethyl methacrylate , ketones and alcohols. All the chemicals potentially after use must be discarded in beauty salons. The physical and chemical properties of the above-mentioned chemicals neccessitates that their waste products is discarded out of children's reach and far from valuable resources as it may lead to contamination(Keretetse *et al*.,2023). There are also associated health risks which makes it even more crucial to ensure the products are discarded following hazardous waste management protocols are per the guidelines provided by the local municipality and broader legislative bodies (Keretetse *et al*.,2023).

Beauty salons are key role-players in providing hair and nail services which are integral to enhancement of beauty for society. Hairstyling is a service offered by hair salons which involves the processing of hair with physical or chemical products to achieve a desired hair texture, shape or colour. It also includes the removal of hair through cutting and shaving (Bailey *et al*., 2014; Lowe, 2016). Hairstyling can also be regarded as an extension of fashion and artistic expression as much as hairstylists tend to dress and style hair in its natural form. Understanding how to treat and style diverse natural hair textures of clients from different ethnic backgrounds or ages is key to attracting more clients in the hairstyling market, especially in a multi-ethnic society. The best styling results come from understanding the biological structure of a client's hair and how it responds differently to physical elements like heat, styling relaxers and colourants (Bailey *et al.*, 2014). It is important for hair therapists to be familiar with the different hair textures which can roughly be grouped into eight types based on the biological structure (L'Oreal Groupe, 2016) (Figure 3).

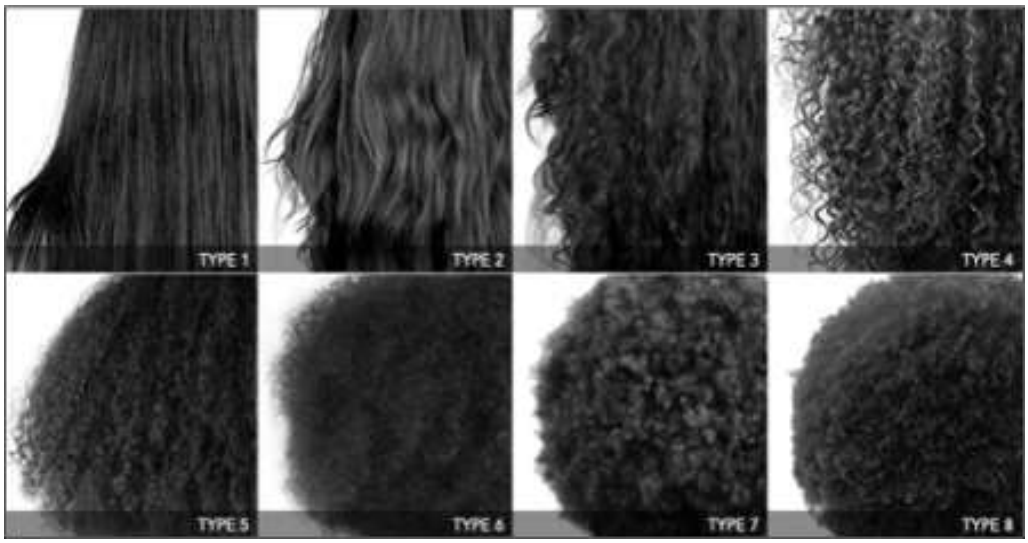

Figure 3: Types of hair textures (Source: L'Oreal Group, 2016)

The types of hair textures depicted in Figure 3 respond differently to treatment with relaxers, styling gels and perming. Moreover, hair can also be grouped in types that can be categorised into four broad sub-groups distinguished by the shape and pattern of the hair strands. These are Straight (Type 1), Wavy (Types 2 and 3), Curly (Types 4 and 5), and Coiled (Types 6 to 8). Straight hair as depicted in Figure 3 tends to be more manageable and resistant to damage by heating as the hair strand grows in a linear form. Curlier hair grows unequally and requires more care to manage the shape and growth patterns of the hair strands. The science of hair is crucial for hair stylists to understand, who are concerned about the aesthetics of the clients' hair as much as the health aspects of hair (Bailey *et al*., 2014; Lowe, 2016).

Nail treatment is also a service offered by salons which involves applying artificial nails and performing decoration which enhances beauty while maintaining the hygiene of the nails and hands. Understanding the science of nails is also important in ensuring quality nail treatments. Natural nails are treated by sanitizing them and altering them with decorations which enhances beauty and appeal (Keretetse *et al*.,2023). Hair and nail therapists and technicians are important to clients because they care for their outward presentation, which is one aspect of the human body that affects a consumer's personal image (Brouwer *et al*., 2023; Keretetse *et al*.,2023).To clients, hair and nails represent their culture, identify, fashion and values (Donahoo, 2019; Lowe, 2016). The market for hair and nail care services is growing rapidly in South Africa hence in most townships on almost every corner has a beauty establishment brand.

Beauty product manufacturers play an important role in the beauty value chain by rendering services and products to beauty salons. The products include nail polish, hair moisturisers, shampoos, conditioners, chemical relaxers, hair colourants and many others (Bailey *et al.*, 2014; Lowe, 2016). The manufacturers ensure hair and nail care products are distributed to major retailers and salons. The majority of manufacturers also offer training to hair and nail therapist on the use of their products and provide marketing materials for promotion of the products and therefore the salons. The marketing approach of most hair salons internationally and in South Africa centres on advertising and displaying completed hairstyles and branded products so that clients recognise the brands they prefer, and associate them with a salon and its stylists (Brouwer *et al*., 2023; Keretetse *et al*.,2023). The skill of a hair or nail therapist or technician to correctly use and deliver the promises of the product is key to the success of the

product-user relationship. Manufacturing companies therefore place trust in beauty therapists to appreciate, endorse, use and recommend their beauty product to clients.

2.5 Understanding the nature of beauty salon products

Navigating through the many beauty salon products can be an activity that takes a significant amount of time as so many products are used to accommodate the different needs and treatments of clients. It is therefore useful to have a guideline that one can use to inspect the hazardous nature of a product. It is important that beauty salons understand what is hazardous waste and how to identify it. Hazardous waste refers to waste whose toxicity characteristics result in substances harmful to environmental and human health. Hazardous substances are characterised by components that may be acidic, alkaline, flammable and corrosive (Dimitrova *et al*., 2009; Brouwer *et al*., 2023). Hazardous waste generators must have a filing system which includes a waste manifest document and Safety Data Sheets. The records must be filed for the minimum years prescribed by the regulator and made available to the regulator on request. Figure 4 demonstrates the processes involved in determining whether a product is hazardous or not.

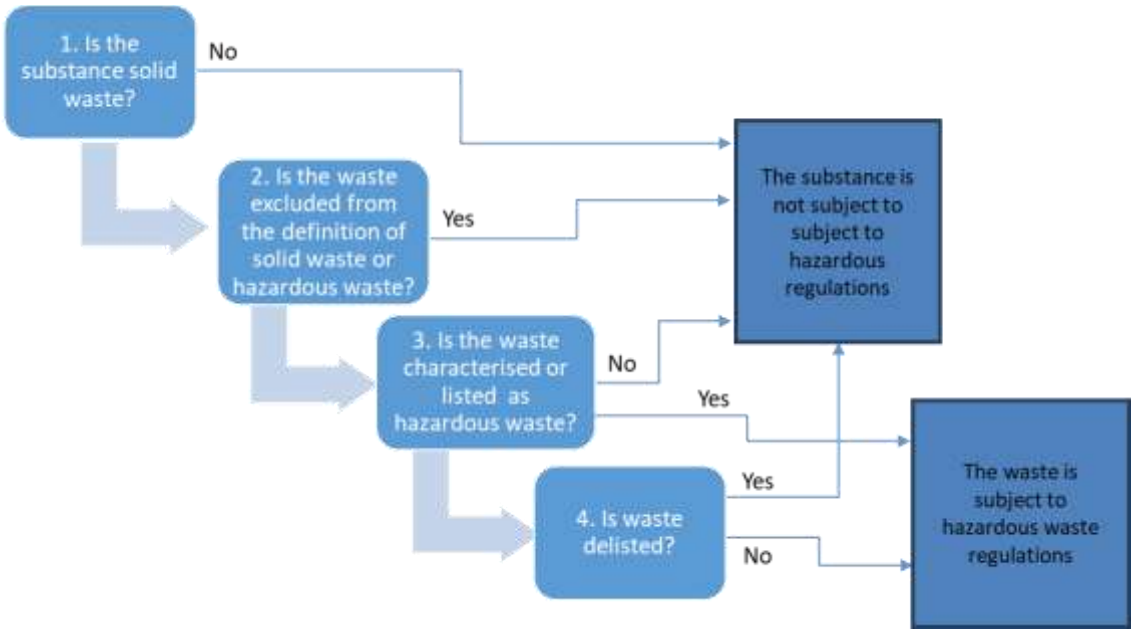

Figure 4: Hazardous waste identification(Source: DEA, 2011)

Hazardous ingredients in salon products can be inspected by studying the product label. Keeping additional research notes is advisable as manufacturers are not obliged by law to list some categories of ingredients contained in sold products. Exploring the Safety Data Sheets linked with the salon product is also a method of inspecting the hazardous nature of a product. The Data Sheet is found inside the container or box of the product when bought from approved retailers (Dimitrova *et al*., 2009; Brouwer *et al*., 2023). Manufacturers usually also have a customer service line which can be used in conjunction to gather additional information about the ingredients of a product. It is advised that salon personnel avoid exposure to harmful chemicals as per the Safety Data Sheets. It may be a challenge to totally avoid contact with a hazardous product in a salon environment (Zeng *et al*., 2016). Moreover, it is possible that one may not be aware of the hazardous nature of some products as some retailers do not disclose all the product labels. Exposure to hazardous chemicals can be reduced by:

1. Employing an effective ventilation system in the salon which expels toxic fumes,
2. Positioning dustbins strategically far from salon personnel and clients,
3. Minimising product usage by applying small quantities when performing treatment,
4. Strict and full usage of personal protective equipment (PPE),
5. Constant sanitizing and disinfecting of the salon surface (Ukpong and Udophia, 2011).

Many beauty salon products have chemicals such as formaldehyde. This chemical is found in nail polish, nail tips and hair straighteners. Formaldehyde hair-straightening procedures are linked to hair loss. Ammonium persulfate is found in hair bleaches and its fumes can result in asthma and dermatitis (Ukpong and Udophia, 2011). The hazardous nature of the chemicals can have health implications on salon workers and result in wheezing and eye irritation. The chemicals ethyl methacrylate and dibutyl phthalate are found in artificial nail tips and these have long term health implications and must be discarded following strict hazardous waste management guidelines (Brouwer *et al*., 2023). Acetone is a common chemical used in nail polish removers and hairsprays. Solvents such as toluene is present in nail polish, nail glue, hair dye and wig glue. Another common chemical found in hair extensions, glue and lace wig glue is styrene which if exposed to the eyes can result in vision impairment (Sahota, 2014; Brouwer *et al*., 2023). Beauty salons also apply hair oil, masks and serums to ensure hair is shiny and nourished. Shampoos are used to wash the hair before any treatment is performed. Shampoos have the chemical diethanolamine as a foaming agent (Brouwer *et al*., 2023; Keretetse *et al*.,2023). As such, as shampoos are key to maintaining healthy hair, their chemicals can contribute to scalp irritation and therefore such chemicals cannot be discarded

easily. Another chemical found in shampoos is parabens which are also used in moisturisers, shaving gels, spray tanning solutions, makeup and toothpaste (Planko *et al*., 2016; Brouwer *et al*., 2023). It is important that salons know how to store hazardous chemicals and products on their premises. Beauty wipes soaked in nail polish acetone are recommended to be stored and transported in non-leaking, enclosed containers. Furthermore, the container is required to be flexible to hold free liquids. Evaporation of hazardous liquids during storage is not recommended (Brouwer *et al*., 2023).

Table 1: Chemicals used in beauty salon products and their health effects

Chemical name	**Beauty salon product**	**Symptoms of exposure**	**Health implication**
Dibutyl phthalate	Nail polish	Dizziness and nausea	Reproductive problems
Formaldehyde	Acrylic hardener, hair straighteners, nail polish	Skin and throat irritation	Cancer, dermatitis
Toluene	Nail glue, hair dye, hairpiece bonding	Headaches and vision problems	Kidney failure
Methyl methacrylate	Nail tips	Chest pains, nose irritation	Asthma
Cyclomethicone	Hair sprays	Wheezing, skin rashes	Dermatitis
Styrene	Hair extension, glue wig glue	Fatigue, vision problems	Cancer
Trichlorethylene	Hair glue and hair piece	Dizziness and skin irritation	Kidney and liver failure
Dioxane	Hair extension glue	Nose and eye irritation	Kidney failure, cancer
Ethylen glycol monobutyl ether	Sanitizing cleaners	Nose irritation and headaches	Reproductive problems

(Source: adapted from Sahota, 2014)

Beauty salon products and their chemical waste are not the only waste that salons should be concerned with. Beauty salon environments like many other working environments are required to be clean and inviting to clients. Cleaning products with the chemical ethylene glycol also produce hazardous chemical waste and must be discarded in a manner compliant to waste management guidelines. Waste management practices enshrined in legislation are not uniform in different situations, however. Although salon products have chemicals which are hazardous, they are safe to use and do not pose much of a risk (Ukpong and Udophia, 2011; Brouwer *et al*., 2023). Unlike in the home where products are used in a small amounts and in a single use, a beauty salon environment uses larger amounts of products and repeatedly over a long time period. The chemicals can evaporate, releasing Volatile Organic Compounds (VOCs) as fumes, which salon workers should be protected against through inhalation (Lowe, 2016). In many cases beauty salons do not have adequate ventilation strategies. This results in fumes being concentrated in the confined salon space and posing health implications for clients and salon personnel (Maifadi *et al*., 2020). Waste management is also required to ensure that chemicals are not discarded incorrectly where other people can have access to them, or where salon workers are affected through the fumes released. In addition to practicing waste management which protects human health and the environment, beauty salons should encourage all salon personnel to use personal protective equipment (PPE) at all times to prevent any hazardous substances having entry into the human system through the mouth, nose or hands (Maifadi *et al*., 2020). The following are ways in which beauty hazardous substances can have entry into the human system if not protected by PPE:

1. Inhalation: An example is breathing in air filled with hairspray and hair bleaches,
2. Skin absorption: An example is if nail acetone accidentally spills onto an open wound,
3. Injection: An example is accidentally being spiked by a nail clipper while performing nail treatment,
4. Direct contact: An example is being splashed with hair cream if not using latex gloves,
5. Ingestion: An example is swallowing food or drink contaminated by chemicals such as nail acetone which is suspended in the air or transported by a hair dryer (Brouwer *et al*., 2023).

It is therefore important that beauty salons exercise waste management practices that align with relevant guidelines and legislation (Dimitrova *et al*., 2009; Sahota, 2014). Various industries have industry-based waste management guidelines that are specific to the types of waste streams that that industry deals with. Beauty salons also have a responsibility to ensure they

are aware of the relevant legislation which governs their waste stream in order to balance beauty needs with environmental needs whilst also complying with relevant laws and industry practices. The beauty industry can thus contribute to building a resilient and sustainable future by ensuring its waste streams adhere to environmental laws (Planko *et al*., 2016).

2.6 Challenges of beauty salon waste management

2.6.1 Introduction

The beauty salon industry faces a myriad of waste management challenges from 'cradle to grave' of beauty products and procedures. The challenges are operational and environmental in nature and start at the manufacturing stages of beauty salon products. This section will explore these challenges in more detail.

2.6.2 Overview of the challenges

As concerns rise over the impacts of beauty salons on the environment, so does the sophistication of marketing of beauty products. In the modern world, hairdressing, cutting and dying is a statement of self-expression (Moore and Miller, 2007; Verma, 2009). However, the processes involved these activities does not end when the client walks out of the salon (Garbaccio and Oliveira, 2013; Nassaji *et al*., 2015). Beauty salons are challenged to not only focus on rendering beauty services but also to consider the impacts of beauty waste on the environment. The resulting waste stream presents a significant environmental challenge. The oils and chemicals used for salon treatments produce waste that requires proper management (Enemuor *et al*., 2013; Zota and Shamasunder, 2017). Salons' methods of waste disposal present a challenge as some salons dispose of hair and other products in refuse bags, managed through the same waste chain as other waste, and can take years to decompose within landfills (Ryu, 2005). Many salon products also contain harmful substances that result in hazardous waste generation. Phenylenediamine or benzenediamine dihydrochloride are chemical components of most hair dyes and are toxic and lethal if digested by animals (Labrèche *et al*., 2003; Nassaji *et al*., 2015; Bilal *et al*., 2020). They also pollute the soil and water resources hence are not appropriate to be poured down the drain (Mishra *et al*., 2020; Alharbi and Alhashim, 2021). This results in salons exploring products with natural ingredients such as shea butter, coconut oil and vegetable glycerine which does not require complex waste disposal

methods. Manufacturers of beauty products which contains harmful ingredients and formulas are aware of these challenges and try to capitalise by marketing more natural ingredients. However, these do not necessarily render the products safe and non-hazardous, and this poses a challenge for beauty salons to discern environmental benefits from opportunistic marketing (Sahota, 2014; Zeng *et al*., 2016). Beauty personnel and clients may be misled by the marketing of products which may be more expensive. A further challenge for consumers is, unlike food products, most beauty products do not specify the percentage ingredient of each chemical contained, making it more difficult to avoid those waste products that have environmental impacts (Sahota, 2014; Planko *et al*., 2016). Beauty salons may choose products that they do not fully understand, especially as new products emerge on beauty blogs and social media platforms (Dimitrova *et al*., 2009). The challenge beauty salons face is that clients expect salons to buy all the relevant and newest products. Products advertised on social media may not be suitable for particular skin or hair types, leading to unsatisfactory results that are then blamed on beauty salon practitioners.

Beauty salons, to keep up with client demands, may therefore secure a wide range of products even if their impacts on clients and their waste composition are not worth it. Beauty salons should communicate with clients regarding the waste impacts of certain products and that social media advertisement does not necessarily translate into the product being effective (Planko *et al*., 2016). The oversaturation of the beauty salon product market combined with the need to keep up with societal beauty standards and trends results in unnecessary waste being produced and thus disposed of by salons. This may mean there is a need for stricter regulation of beauty product manufacturers to ensure their products have a low waste footprint and comply with relevant laws (Lowe, 2016; Donahoo, 2019). Beauty product manufacturers should also be certified and reviewed by competent independent forums to ensure beauty product formulas are compatible with environmental sustainability. Activism in ensuring beauty product manufacturers comply with environmental laws has been displayed historically, however their compliance remains low and relevant authorities are not enforcing compliance very rigorously (Lowe, 2016; Donahoo, 2019).

The knowledge gap that exists about the ingredients of beauty products is another challenge beauty salons face when adopting best waste management practices. Figure 5 illustrates the stages of development of beauty products and therefore where salon personnel and clients can they influence change. Stage 1 is based on idealizing and researching the type of product you

endeavour to produce. Stage 2 involves gathering suitable raw materials. Stage 2 empowers manufacturers and society through public participation to choose raw materials that are organic or have a lower environmental footprint (Planko *et al.*, 2016). Stage 3 deals with storage which is also influenced by the choices made in Stage 2. Hazardous beauty products have storage protocols which beauty salons are required to conform with. Choosing organic products is positive for the environment but also has implications for hazardous product regulations in salons. Once the design and storage protocols are in place, Stage 4 involves sorting in preparation for Stage 5 which is where the production process takes place. Stage 6 is where the choice of packaging needs to be informed by advancing environmental benefits and choosing biodegradable packaging which has a lower environmental impact (Sahota, 2014; Planko *et al*., 2016). Stages 2 and 4 are critical as this is where physico-chemical analysis is done. This stage is important in order to assess the environmental aspects of production. Finally at Stage 7, the product is shipped to consumers which includes the general public and beauty salons. At Stage 7 there is little that can be done to change the product and ensure it is environmentally sound. It is therefore important for beauty salons to understand the production cycle of beauty products and where they can be role players and influence decisions which touch on waste management. It is also important for beauty industries to understand that environmental concern is not only in the chemicals used but the amount of water used which eventually finds its way into natural water systems (Dimitrova *et al.*, 2009; Maifadi *et al*., 2020). Beauty salons and civil organisations need to push for reducing water use in the production process. It is therefore important for all beauty salon stakeholders to be aware of the processes and accordingly advance proper waste management in the beauty sector, from the inception stage to the end product.

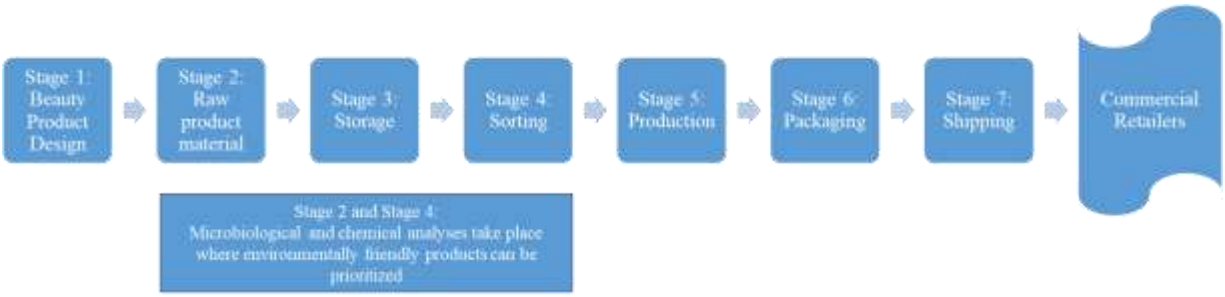

Figure 5: Beauty product manufacturing stages(Source: adapted from Pereira et al., 2010)

Dissemination of information in the beauty sector is required for raising awareness and differentiating sustainable beauty products in the market against those that have environmental impacts (Sahota, 2014; Planko *et al*., 2016). More needs to be done by all stakeholders on the expectations for beauty salons and corporate beauty product manufacturers to be environmentally responsible. Government and beauty salons need to lead training to identify certain hazardous ingredients in products and to influence the shopping choices of beauty salons and their clients. Beauty product manufacturers should be compelled by law to provide all the necessary information about beauty products and their health implications (Sahota, 2014; Planko *et al*., 2016). This will ensure a closer relationship between product manufacturers and consumers whilst improving the competitiveness of beauty salons to overcome challenges of waste management.

2.6.3 Beauty industry waste challenges during different stages of the product life cycle

The environmental impacts of beauty salon waste is not limited to when it reaches the consumers. It is therefore important to highlight the environmental impacts of beauty waste at different stages of its life cycle (Figure 5). This approach can identify loopholes in the life cycle and accordingly intervene at the relevant stages.

2.6.3.1 Beauty waste at production stages

The diversification of the beauty salon industry has been accompanied by large quantities of waste in different stages of beauty product production and consumption. Effluents can percolate into groundwater and retard the photosynthesis of aquatic organisms (Maifadi *et al*., 2020). Manufacturers are aware that beauty product clients prefer long-lasting products and thus add preservatives and antioxidants to prevent micro-organism growth and oxidation, and these lead to negative environmental impacts.

The use of parabens and other chemicals has environmental and health implications (Sahota, 2014; Planko *et al*., 2016). In addition, titanium dioxide present in hair lotions can absorb and reflect sunlight, detrimentally disrupting the development of aquatic organisms when this is washed into water systems. A switch to the use of palm oil as a more sustainable ingredient in beauty products can also have unsustainable aspects where palm and coconut oil plantations encroach on natural forests and biodiversity (Wieczorek and Czernik, 2016).

Beauty salon product chemicals are not the only concern. Water from beauty salons is often highly alkaline. Municipalities often address this by using a corrective solution of inorganic, sulfuric and hydrochloric acids to reduce water alkalinity (Wieczorek and Czernik, 2016). If this water is not treated, people can be exposed to water which is not suitable for human consumption. Waste water from beauty products also contains high chemical oxygen demand and compounds with low biodegradability. The physico-chemical treatment of beauty product waste involves sophisticated and expensive equipment (Planko *et al*., 2016; Maifadi *et al*., 2020).) The negative environmental impact of beauty waste neccessitates that an assessment be done on the possibility of using the toxicity of beauty waste for energy conversion purposes. This approach will add value to waste products that would previously have been discarded without extracting any economic benefits.

2.6.3.2 Beauty waste at consumption stages

Waste generation of beauty products in the production stage results in waste generation in the consumption stages (Wieczorek and Czernik, 2016). Moreover, at the consumption stage, waste from packaging adds to the high environmental impact. Plastic containers of most shampoo and hairspray products end up in landfills (Maisels *et al.*, 2022) but recycling and biodegradability of packaging material is the starting point for reducing waste at consumption stages. The Life Cycle Analysis (LCA) of a product empowers beauty product manufacturers to assess the environmental impact of products from the point of raw materials. LCA can aid in designing beauty products with biodegradable components (Maisels *et al*., 2022). This can translate into less waste being produced from the production and consumer stages. Table 2 outlines the raw and processed materials used in many beauty product packaging. Applying hybrid packaging designs will also be useful to balance the cost implications of the materials. However, not all beauty product manufactures have the same financial capacity to use sustainable or biodegradable materials so therefore a hybrid approach is recommended. Hybrid designs balance cost, type of material, amount of material used, and environmental sustainability of the product. Hybrid approaches promotes creative packaging design and materials (Wieczorek and Czernik, 2016). Creative design can appeal for marketing purposes. Hybrid solutions therefore have a myriad of benefits.

Table 2 :Packaging applications and properties

Packaging raw material	Application in packaging	Packaging properties
Plastic	Hairspray and hair cream bottles	Moisture resistant and recyclable
Paper	Secondary packaging for bought products such as hair styling gels	Recyclable and reusable
Wood	Secondary packaging used to store combs	Biodegradable, recyclable and toxic free
Glass	Hair toner, olive oil and serum bottles	Recyclable, recoverable
Aluminium	Oil sheen bottles	Durable and recyclable

(Source: adapted from Wieczorek and Czernik, 2016)

Adoption of a waste management program can help in making informed choices in production and packaging to reduce waste at all stages of the waste life cycle (Gertsakis and Lewis, 2003; Ryu, 2005), including packaging, separating, and storage of hazardous salon items (Zota and Shamasunder, 2017). Environmentally sound beauty salon waste management lies in adopting waste management practices enshrined in legislation and being more cognisant of the impacts of waste on the environment (Gertsakis and Lewis, 2003). It is therefore important that beauty salons have waste management practices that are relevant to their needs. Table 3 shows how municipalities are role players in various waste management activities especially at a local level. Municipalities are therefore part of the waste management hierarchy and the circular economy.

Table 3: Municipality contributions to waste activities within beauty salons

Waste activity	General waste	Organic waste	Recyclables (paper, plastic, metal, glass, tyres)	Hazardous waste (batteries, solvents)
Facilitates societal waste awareness and education	Municipality	Municipality	Recycling industry	Industry
Providing bins at source or takeback facilities	Municipality	Municipality	Municipality to provide additional bins at source, industry provides accessible takeback facilities	Industry
Collecting waste	Municipality	Municipality	Independent companies aid the municipality to collect waste, e.g. EnviroServ	Industry
Processing waste	Municipality	Municipality	Independent companies aid the municipality to process waste, e.g. EnviroServ	Industry
Disposal of waste	Municipal landfill	Municipality	No disposal as per targets	Industry

(Source: DEA, 2011)

2.7 Beauty salon waste management recommendations

Beauty salons as waste generators have responsibilities to ensure environmental aspects are embedding in every aspect of their operations in order to comply with legal requirements. Salons need to educate their personnel in toxic ingredients such as diethanolamine, found in shampoos, which has negative environmental impacts on aquatic ecosystem health. Rising environmental consciousness in the beauty industry is being promoted and this translates into beauty salons adopting best waste management practices as set out in the Waste Management

Act (No. 59 of 2008) and supported by the beauty salon industry's own set standards. Many beauty salon products are made of plastic, and Table 4 can guide waste generators to recycle before disposing of a waste product permanently.

Table 4: Plastic number symbol and recyclability factor

Plastic number symbol	**Polymer name**	**Recyclable (Yes/No)**
1-PETE	Polyethylene (PETE)	Yes
2-HDPE	High-density Polyethylene (HDPE)	Yes
3-V/PV	Polyvinyl Chloride (V/VC)	No
4- LDPE	Low-density Polyethylene (LDPE)	No
5-PP	Polypropylene (PP)	No
6-PS	Polystyrene (PS)	No

(Source: *adopted from Maisels et al., 2022*)

Beauty salons and clients are starting to realise the importance of environmental protection in the beauty salon industry in order to sustain operations and minimise environmental impacts (Planko *et al*., 2016). The practice of evaluating the toxicology of formulas used in salon products can contribute towards changing product consumption to more eco-friendly natural products including shea butter and olive oil. Greater awareness of chemical ingredients in salon products can encourage changed behaviours and preferences for natural products with a lower waste and carbon footprint (Planko *et al*., 2016; Wieczorek and Czernik, 2016). The recommendation for beauty salons is to use biodegradable packaging, organic products and those with lower water use((Maifadi *et al*., 2020). Beauty salons can influence environmentally friendly product cycles and technologies through public participation. The recommendations align with best practices as per the United Nations Sustainable Development Goals (SDGs). Figure 6 indicates each recommendation and which SDGs it aligns with.

Figure 6: SDGs and waste management actions (Source: DEA, 2011)

The SDGs are endorsed in many nations as the cornerstone of ensuring the resource needs of the present do not compromise those of future generations. SDGs 14 and 15 are premised on waste generation and combating waste through reusing and recycling, and this is compatible with beauty salon waste practices (Planko *et al*., 2016; Wieczorek and Czernik, 2016). Beauty salons should endorse organic beauty products such as microalgae and bacterial cellulose, thereby aligning with the SGDs as outlined in Figure 6, in particular with SDG 3 which is premised on personal care and body maintenance.

2.7.1 Nail treatment recommended practices

Nail art is appealing but the waste that results needs guidelines for handing because of the chemical properties of nail products (Rogula-Kopiec *et al*., 2019). Nail treatment pertains to basic nail services, which includes but is not limited to manicures , pedicures, nail polish , gel and acrylic applications. Nail treatments requires to be done by skilled technicians in order to ensure practices which are hygienic and meets the beauty standards of clients. Best practices as observed in beauty salons when performing nail treatments begins with an acetone soak-off process to remove existing nail polish or decorations (Keretetse et al.,2023 Keretetse *et al*.,2023).The existing nail art can also be removed manually by scrabbing it off. A practice endorsed by nail technicians commonly administers the soak-off by immersing the client's

nails in an acetone hot bath with acetone mixed with luck warm water. The processes yields acetone being heated and expediting the nail removal processes. This practice is recommended over manual removal of art because it is safe and quick (Keretetse *et al.*,2023). An alternative method is removing nail polish by moistening cotton with small quantities of acetone, then covering the acrylic fingernail and wrapping it with aluminium foil (Lee *et al*., 2021). Beauty salons use products from known brands which are safe to use and have good reviews however other products are hazardous (Keretetse et al.,2023).

Hazardous that requires to be discarded safely taking into consideration waste management guidelines as per the waste act include polish remover, fluorescent bulbs, batteries, gel, dehydrators, glue, acrylic powder and disinfectants used to clean manicure and pedicure equipment. In most cases nail polish is removed by submerging nails in a container full of acetone liquid. Cotton balls with acetone should not be disposed of in normal garbage containers as it can cause a chemical reaction with other products (Rogula-Kopiec *et al.*, 2019). Acetone liquids and nail polish are regarded as hazardous waste and must be discarded safely following hazardous waste guidelines (Lee *et al.*, 2021). It is incumbent upon nail therapists to collaborate with waste collectors to ensure proper handling and disposal of nail hazardous products (Lee *et al.*, 2021).

2.7.2 Hair treatment recommended practices

During the process of hairdressing, waste is a by-product . Hair care as a term embodies the application of hygienic practices involving the hair which develops from the natural human scalp. The natural hair movement in South Africa created awareness of the need to practice actions which environmentally friendly and stimulates natural hair growth. Herbal products and hair applications are becoming the popular practice(Intelligence, 2023) Hair care products are key to enhance good and healthy hair. Ensuring best practices as per the salon and clients is critical as there is increased awareness among consumers of the damage resulting from chemicals such as sulphates and parabens which are contained in many hair products. Environmentally considerations in conjunction with best practices is underpinned by consumers opting for natural and organic ingredients((Intelligence, 2023). Products such as moisturisers and shampoos that embodies anti-pollution, hair growth, dandruff-free, and are certified as natural products are becoming the popular choice of consumers. Many

manufactures of beauty products are also becoming aware and moving towards sustainable products manufacturing (Mishra *et al*., 2020; Intelligence, 2023).

Environmentally sound ways to handle hair waste is also a subject to be promoted in beauty salons as they embody good hair practices. Many salons are not familiar with how they can reuse or recycle hair waste. Human hair is slow to degrade but is 100% biodegradable (Gupta, 2014; Flanagan, 2019). Human hair particles are not palatable to animals like rabbits; therefore it can function as a pest control. Human hair has a lot of nitrogen and can be an effective fertilizer or as an ingredient in pharmaceutical products (Zheljazkov *et al*., 2008). Hair also contains proteins with essential amino acids that can be extracted and has a high tensile strength so it is a viable option for surgical suturing. Human hair can also absorb oil and chemicals like formaldehyde and mercury from water. It is therefore a cost-effective method of waste purification (Maifadi *et al*., 2020). Hair/clay mixtures can be used to plaster buildings and provide thermal insulation (Das Bheel *et al*., 2017). Its elasticity and thermal insulation properties mean it can be used for mattresses, fabric for clothing, toys and other household items. Hair can be recycled back into the beauty salon industry by converting it into make-up brushes, wigs and extensions (Das Bheel *et al*., 2017).

2.7.3 Recommended hygiene practices in beauty salons

Beauty salons deal with human body treatments it be on the hair scalp or nails. A potential exposure to biological agents is likely provided the nature of the beauty treatments done on hair and nails that can host pathogens and opportunistic microorganisms (Intelligence, 2023). Hygiene needs to be of great concern to the beauty salon workers. The industry is growing which means a proportional increase in exposed for many workers through accidental contact with infectious skin or cross-infection of pathogens (Wojciechowska *et al*.,2019).

There are health implications caused by the direct contact of different skins as a worker. Hair dyes and bleaches have a strong odour which can cause headaches and nausea if air circulation is poor (Nassaji *et al*., 2015; Mishra *et al*., 2020). Razor blades are used in salons for make-up and cutting hair particles. A razor can have blood stains and micro-organisms and therefore is regarded as hazardous waste and needs to be disposed of responsibly (Coulibaly *et al*., 2015). Improper disposal of razor blades could wound people who accidentally handle them (Moore and Miller, 2007). It is vital for hairdressers and beauty therapists to take measures to prevent

disease cross infection when dealing with different clients. Table 5 summarizes the equipment used in salons and how to disinfect the equipment to avoid cross infection.

Table 5: Guidelines for disinfection of salon equipment

Equipment	Method of disinfection	Guideline to disinfect
Brushes and combs	Submerge in disinfectant container	Pre-clean by removing loose hair
Nippers, scissors and tools	Submerge in disinfectant container	Ensure the equipment is submerged in the disinfectant solution
Towels and cloths	Hand wash or use washing machine with hot water	Use one towel for one client only then wash after use
Electrical equipment like clippers and tongs	Wipe or spray with approved disinfectant	Electrical equipment should be wiped not washed in water
Salon surfaces	Wipe with a clean cloth and disinfectant	Disinfect often

(Source: Moore and Miller, 2007; Nassaji *et al*., 2015; Bilal *et al*., 2020)

Innovation is required on how to recycle products such as razors without transferring infection (Coulibaly *et al*., 2015; Alharbi and Alhashim, 2021). Razors can be mailed back to the manufacturing company for safe recycling and/or disposal (Coulibaly *et al*., 2015). Sharps containers can also be used to discard blades, needles, thumb-tacks and beauty cutting tools (Coulibaly *et al*., 2015). These containers are labelled red to indicate their hazardous nature (Garbaccio and Oliveira, 2013).

2.7.4 Mitigating the adverse beauty environmental impacts

Growing out African hair and maintaining a beautiful physical look without the aid of a hair relaxer, can be a challenge. Beauty salon treatments using hair oil, masks and serums can ensure healthy hair and a general boost of confidence in clients. The many chemical ingredients in beauty salon products keep hair nourished and healthy but it is important to understand their impacts on the environment. Beauty product chemicals classified as hazardous include hair dyes and styling agents. Such chemicals have detrimental environmental impacts if not stored, transported and discarded following guidelines as given by regulators and manufacturers. The

plastic product containers invariably become waste which needs to be discarded or recycled back into useful products (Dimitrova *et al*., 2009). Biodegradable packaging and a recycling culture can be promoted by beauty salons (Figure 7). The beauty salon industry therefore has a significant carbon footprint as a result of the volume of waste products discarded. Most beauty salon waste ends up in landfill alongside other commercial and domestic waste (Friedrich and Trois, 2013; Godfrey and Oelofse, 2017). Studies on the health and environmental impacts of waste show there is a correlation between birth defects and low birth weights in communities living close to landfills (Kagonji and Manyele, 2011; Godfrey and Oelofse, 2017). Solutions to environmentally friendly packaging and other elements are being explored by beauty product manufacturers and other relevant stakeholders.

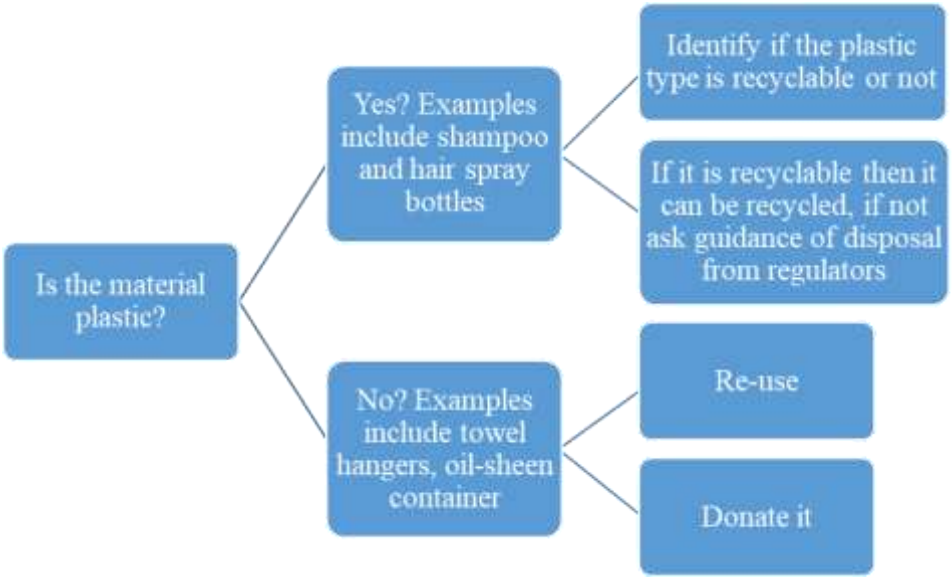

Figure 7: A guide to recycling (Source: The Association of Plastic Recyclers)

Salon management should engage staff and clients about recycling hairdryers and straighteners when buying new ones. The recycling culture in beauty salons can be encouraged, including the use of disposable cups and using alternatives to aluminium hair foils. The recycling culture can be boosted by having different bins for different waste in accordance with their physical and chemical characteristics (Planko *et al*., 2016). Beauty salons should use wooden combs where feasible instead of plastic ones.

The nature of some hazardous salon waste such as acetone and hair aerosols requires waste management solutions developed in collaboration with other stakeholders (Abidemi *et al*.,

2018). A study conducted by a beauty retailer skin store indicated that on average women use sixteen or more beauty products on their face and hair on a daily basis (Curran and Williams, 2012). This includes beauty items such as tweezers, face brushes and buffers. Beauty product consumption is therefore high and requires robust corporate-social responsibilities from the beauty industry (Abidemi *et al*., 2018; Cubas *et al*., 2020). Despite an increased awareness on the impacts of waste on the environment, critics maintain that the beauty industry needs to do more to address their waste management challenges (Abidemi *et al*., 2018). This can include embedding environmental protection and corporate responsibility structures to ensure all stakeholders work together to address waste challenges in the beauty sector (Abidemi *et al*., 2018; Cubas *et al*., 2020).

All waste management practices of salons should conform to the waste management hierarchy aimed to reduce waste, as enshrined in the Waste Management Strategy which is a strategic governmental document aimed to address waste challenges in South Africa (Gertsakis and Lewis, 2003). Oelofse (2008) considers the waste management hierarchy as the cornerstone of all environmentally sound waste management practices. Figure 8 demonstrates the waste hierarchy which beauty salons must consider when handling, segregating and transporting waste. The desire is for salons to consider the waste hierarchy in choosing more favourable options, e.g. waste reuse rather than disposal.

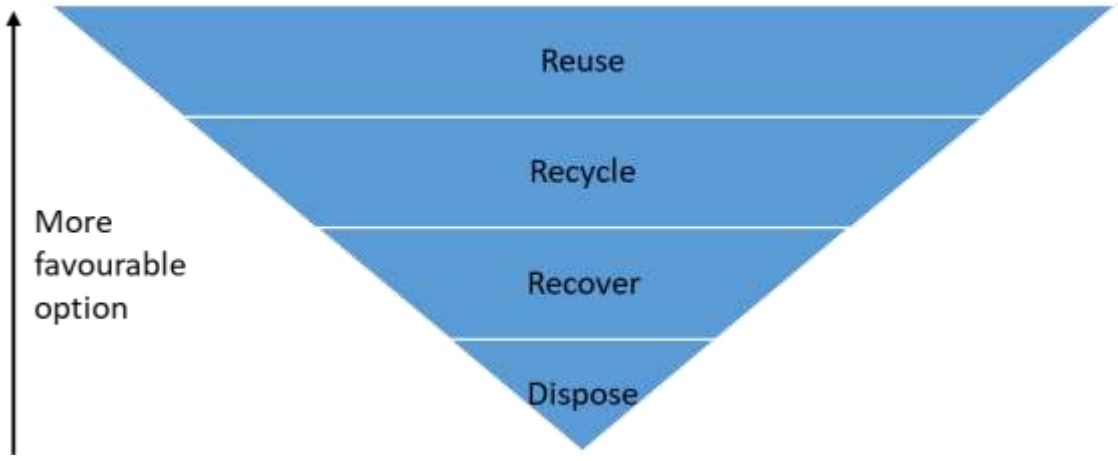

Figure 8: Waste management hierarchy (Source: DEA, 2011)

It is important to consider that the objectives of the National Waste Management Act (No. 59 of 2008) pivots around the waste management hierarchy which is the overarching approach

that informs waste management in South Africa (DEA, 2011). This hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority (Figure 8). All waste generators in all industries should base their waste management practices on the waste management hierarchy (Oelofse, 2008; DEA, 2011). This aims to mitigate the adverse impacts of waste through waste avoidance, prevention, minimization, re-use, recycling, recovery and treatment (Matete and Trois, 2008; Oelofse, 2008; DEA, 2011) and to reduce waste to landfill (Godfrey and Oelofse, 2017). This in turn requires a shift from the linear waste economy, which is based on generating waste and disposing of it without considering recycling and reuse, to a circular waste economy which promotes 'cradle to cradle' as opposed to 'cradle to grave' waste practices (Nahman and Godfrey, 2010). Industries should engage in initiatives that promote the circular waste economy through waste conversion into energy and reuse (Godfrey and Oelofse, 2017). Figure 9 indicates the lifecycle of waste in the circular waste economy.

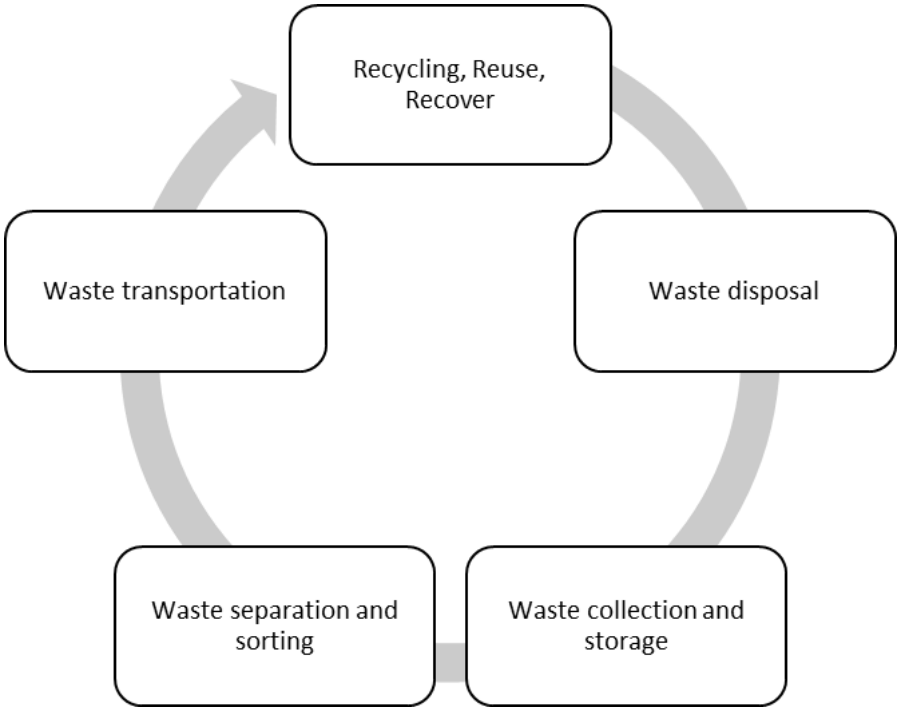

Figure 9: The circular waste economy(Source: DEA, 2011)

The circular waste economy is a model envisaged globally (DEA, 2011). The model promotes economic development through waste reuse and aims to create a culture of waste management underpinned by environmental conservation (Godfrey and Oelofse, 2017). Moreover, it

represents an effective design and reuse of materials to optimise efficiency of waste materials (DEA, 2011).

2.8 The role of beauty civil organisations in waste management

The beauty industry provides services to society but regulators have an important role in ensuring that the industry operates correctly according to the law and does not engage in activities that place clients or the environment at risk. The relationship between the beauty industry and regulators is facilitated by civil and professional organisations which include a range of non-governmental organisations, federations, charities, trusts, foundations and independent society advocacy groups (Adeleke *et al*., 2021). The organisations exist at all spheres of government at local, provincial and national levels. The organisations can aid municipalities in performing services such as the collection and disposal of beauty industry waste (Deakin, 2002; Friedrich and Trois, 2013). Civil organisations, however, do not specialise in the treatment of organic or hazardous waste and therefore must collaborate with the municipality and other relevant stakeholders in accordance with the law. The organisations also engage in campaigns to educate and train beauty salon personnel in environmental practices and where necessary engage in door-to-door outreach. The broad functions of civil based organisations are summarised below (Deakin, 2002; Friedrich and Trois, 2013).

2.8.1 Supporting legislative frameworks

Civil organisations in supporting the beauty industry have an impact in influencing the policy direction of beauty norms and regulations as set out by relevant governmental departments (Friedrich and Trois, 2013). Hood (2002) highlights that civil organisations can disseminate awareness of key industry topics, set progressive standards and contribute to behavioural change to combat irregular waste management practices. Beauty federations also participate in formal relationships with government for improving industry standards. Many of the standards relate to ensuring beauty salon personnel work according to labour laws (Friedrich and Trois, 2013). Beauty salons also need to understand the impacts their services render on the environment, and this is done through ongoing engagement with civil organisations (Julnes and Holzer, 2001).

2.8.2 Participation in beauty industry activities

Civil organisations are leaders in the beauty salon industry in influencing governmental and corporate agendas (Julnes and Holzer, 2001). Civil organisations engage in waste cleaning campaigns where they clean up waste in unregulated waste dumps. Futhermore, in collaboration with beauty salons, they participate in the drafting of best practices developed by salons (Deakin, 2002). Civil organisations together with beauty salons have fund raising events for different bins for different types of waste. Donations and sponsorship are also sourced from different stakeholders and beauty federations. Civil organisations are key role players in disseminating information about waste management systems. Awareness programmes that that deal with beauty products with natural ingredients are not necessarily the solution if innovation and technology is neglected (Deakin, 2002; Friedrich and Trois, 2013). The role of society actors remains key to minimising the environmental impacts of beauty waste.

2.8.3 Behaviour modification

There are fundamental waste practices in the beauty salon industry that require behaviour modification by both salon personnel and clients. Civil organisations in collaboration with other stakeholders engage with beauty salon personnel about responsible waste management. Employment opportunities are provided in recycling and reuse projects, highlighting their importance (Deakin, 2002; Friedrich and Trois, 2013). Some beauty salons also see irresponsible waste disposal as employment opportunities for waste pickers (Julnes and Holzer, 2001). Ongoing engagement with beauty salon management is done by civil organisations and government to strategically address socioeconomic challenges that leads to environmental apathy. Civil organisations can also engage to disseminate information about environmental practices (Julnes and Holzer, 2001; Deakin, 2002).

Many factors influence the strategic direction of how a civil organisation functions including the leadership's cultural, social and economic characteristics. Figure 10 elaborates on these and adds context to what the factors entail. The net effect determines how effective the civil organisation is in serving its mandate.

Figure 10: Factors that influence waste management practices(Source: Diagonal Reports, 2011)

Civil organisations' power lies in engaging with the public and other stakeholders about issues such as the impacts of waste on the environment and human health (Julnes and Holzer, 2001). Their advocacy is key to helping beauty salons to adopt waste management practices that are underpinned by environmental conservation.

Chapter 3: Study Area

3.1 Introduction

The study area of this research is in Rustenburg, North West Province, South Africa (Figure 11). The area forms part of the western lobe of the Bushveld Igneous Complex and as a result attracted mining companies interested in the minerals of the Bushveld Igneous Complex (Raats, 2010). Mining, agriculture and the manufacturing sector are the three main economic sectors, with mining contributing more than 77% to the total GDP of the area (Selepe, 2023). The tourism sector with attractions such as Pilanesberg National Park and Suncity are also important additional economic sectors in Rustenburg (Selepe, 2023). Rustenburg is one of the most rapidly growing towns in South Africa because of increased urbanisation and large-scale industrialisation related to the mining industry (Mosenogi, 2020; Selepe, 2023). Rustenburg has predominantly a Tswana speaking population. Population numbers in 2011 was estimated as 549 575 with more males than females (Selepe, 2023), attributed to the male-dominated mining industry. A considerable number of service sector businesses support the urban population and in the surrounding rural hinterland. This includes the beauty salon industry.

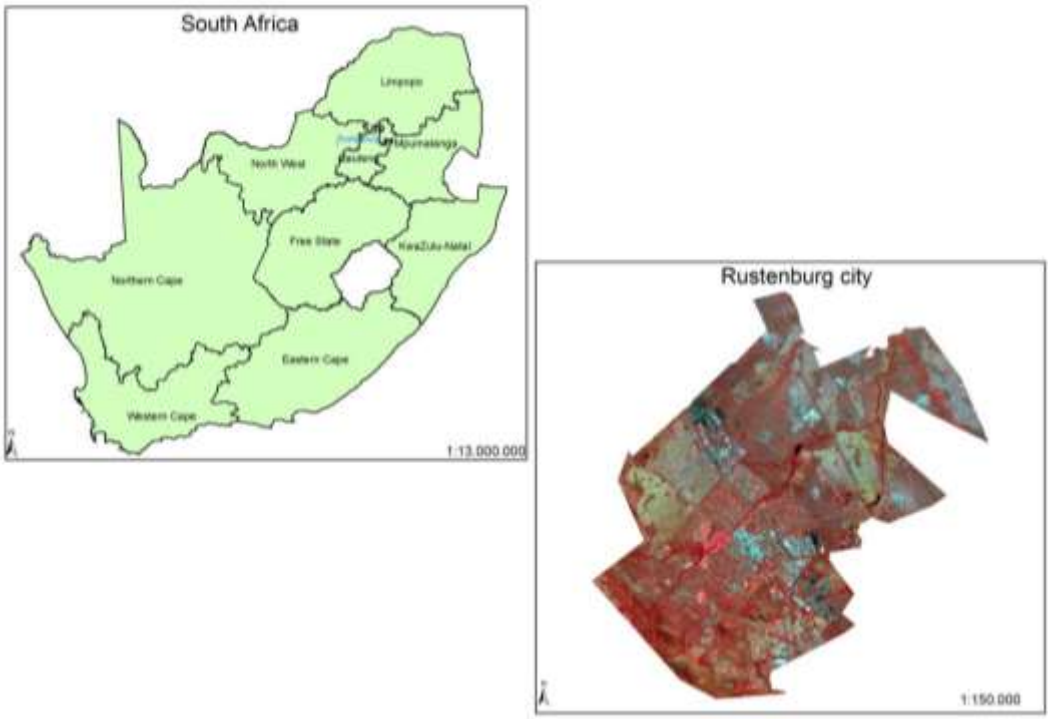

Figure 11: Location of Rustenburg in North West Province, South Africa (Source: Mudau et al., 2014)

Chapter 4: Research Design

4.1 Introduction

This study employs a mixed methods design because it includes both quantitative and qualitative methodologies (Creswell *et al*., 2003). Quantitative methods are used to physically measure beauty waste in salons weekly for two months, and the results recorded in tabular format. Qualitative methods are employed by interviewing respondents who work in the beauty salons and by observations made by the researcher on salon practices. The study will measure the amount of waste generated by the 15 selected salons on a weekly basis for two months. The amount of waste generated will be measured by weighing it on a weight scale. The researcher will request the personnel of the salons to keep the waste at a designated site and not discard it until the designated day the researcher will be measuring the waste. Furthermore, the researcher will aim to measure waste every week before the municipality collection day or the day prescribed by the beauty salon management as a disposal day to another waste facility to ensure waste is not found discarded. The researcher will wear protective clothing to prevent and minimise any potential health and safety risks. The researcher will use the time of measurements of waste also as time to make researcher observations of the waste management practices .

Several beauty salons are situated in the Central Business District (CBD) and the surrounding areas of Rustenburg such as Lefaragatlhe. The study takes as a sample 15 Rustenburg beauty salons (Figure 12). These were selected because they are located in the busy CBD and the surrounding area of Lefragatlhe serving the surrounding regions. The salons cater for people of all economic backgrounds. The salons were also selected because they have fully operational, fixed premises and produce hair and nail treatment waste. The salons attract children, community members and the public at large as clients. Salons also provide employment especially for young people and individuals of limited educational background.

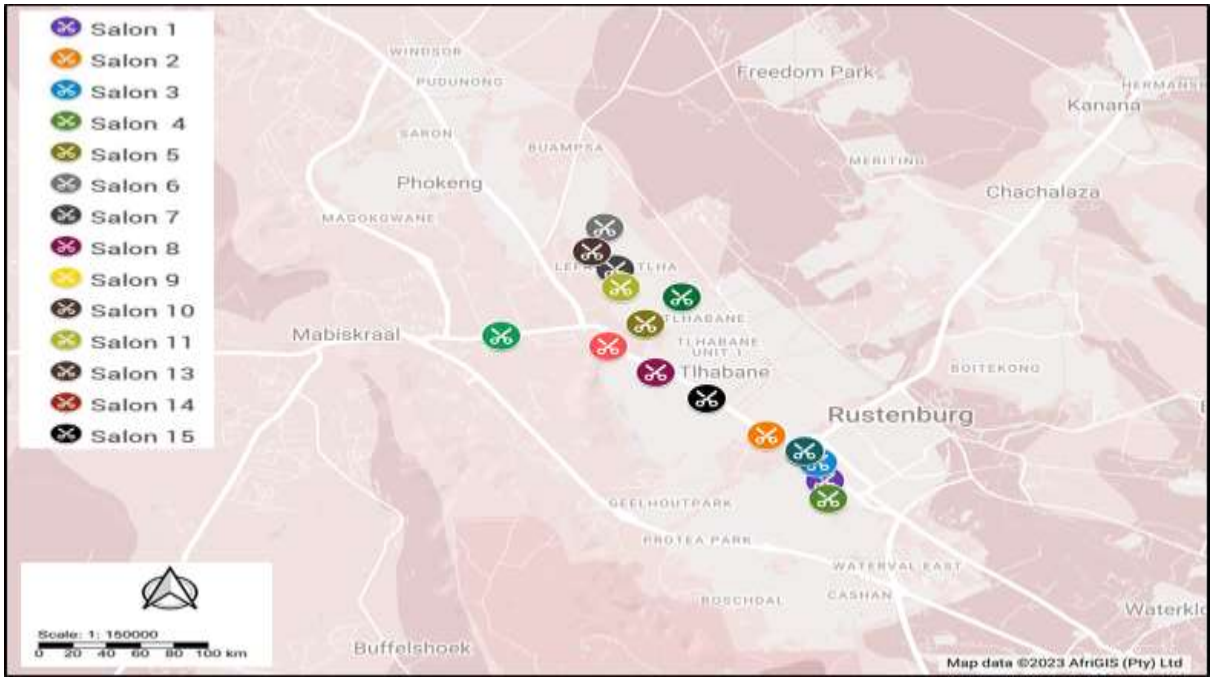

Figure 12: Map of Rustenburg beauty salons selected in this study (Source: Google Maps, 2023)

The research focuses on two categories of salon waste, namely hair and nail treatment waste. This is because this represents the waste produced by the most common treatment types offered by all the 15 salons selected in this study. The waste products resulting from hair and nail treatments include latex gloves, hair cream, aluminium foil, hair dye, cans, tubes, hair pieces, shampoo, aerosols, nail powders, nail glue, acetone, acrylic, nail polish and adhesive cyanoacrylate. It also includes cut hair, used tissues and cotton balls, waste water, and potentially broken or discarded combs, razors and other items. Table 6 illustrates the common salon hair and nail treatment services and the waste products they produce in the salons examined in this study.

Table 6: Waste products found in the salons examined in this study

Hair treatment services	
Salon services	**Waste products**
Hair relaxing	Hair cream, dyes, aluminium foil, brushes, spatula, latex gloves
Haircut and plaiting	Hair pieces
Hair wash	Shampoos, aerosols, hair spray cans, chemical water

Hair treatment	Shampoos, treatment cream, latex gloves
Hair styling	Brushes, razors, hair, used tongs and electrical equipment
Nail treatment services	
Salon services	**Waste products**
Manicure and pedicure	Nail powders, nail glue, acetone, acrylic, latex gloves
Nail trimming and polishing	Nail particles, nail polish, adhesive cyanoacrylate

4.2 Sampling strategy

This study uses a purposive sampling strategy to identify respondents for the research. This methodology is suitable because it allows for a specific understanding of the phenomenon being investigated from the viewpoint of key informants. The population of respondents selected for interviews is based on the fact that they work at one of the 15 beauty salons. The beauty salon names are not mentioned here to protect their identity but are instead coded as salons 1-15 (see Figure 12). Written permission to sample the selected salons was obtained from the salon owners/managers (see section 4.5).

Beauty salon officials who were invited to participate in the research come from the following groups:

1. Beauty salon owners/managers: This refers to any participant who is appointed as a manager or is the owner of a selected beauty salon. One respondent from each salon was selected to participate in the study (n=15). These respondents are coded in the results as SO1-SO15. Each number is indicative of a participant from a specific salon.
2. Beauty salon hair and beauty therapists: This refers to any participant of a selected beauty salon who is a hair and beauty therapist. Thirty people in this category were selected across the beauty salons, with two respondents from each salon. These respondents are coded as BT1-BT30. Each number is indicative of a different participant.
3. Beauty salon cleaning and maintenance personnel: This refers to any participant who comprises the cleaning and/or maintenance personnel of a selected beauty salon. Thirty officials in this category were selected across the beauty salons, with two respondents from each salon. These respondents are coded as SCM1-SCM30. Each number is indicative of a different participant.
4. Beauty salon clients: This refers to any person who receive beauty treatments at a selected salon. Sixty clients across different salon were selected, with four respondents from each

salon. These respondents are coded as SC1-SC60. Each number is indicative of a different participant.

5. Beauty salon stakeholders (federations and civil organisations): This refers to any society and/or group who is mandated to represent the interests of the beauty salon industry and that are active in Rustenburg (n=8). Two respondents from each organisation in this category were selected, with respondents coded as SS1-SS8. Each number is indicative of a different participant. The organisations/federations selected were: The Bojanala Beauty Salon Federation, Woman in Beauty Salons Organisation, Lefaragatlhe Federation of Salons, and The Beauty Association.

The total number of respondents in this study is therefore 143 without factoring absenteeism. The sample size of beauty salons is 15, and this is deemed adequate to provide the researcher with a good understanding of waste management practices. The selection and sampling process was ultimately dependent upon the number of beauty salon personnel present in individual salons, and the availability and willingness of respondents to participate in the study.

4.3 Data collection methods

Various data collection methods were employed to ensure quality of the study findings. The methods of data collection are as follows.

4.3.1 Quantitative observations and waste measurements

Observations were made by the researcher in the salons to assess the waste produced in all the beauty salons and in order to establish the waste management practices of each salon. The observations were made for a duration of two months weekly, in conjunction with measurements of waste produced in each salon for this time period. The researcher took waste measurements and then spent 20-30 min in each of the salons to observe how waste is handled and disposed of. The researcher observed practices such as whether waste is separated at source into different bins, or managed in alignment with national waste management principles. Observations were made by the researcher without direct intervention with salon operations. The researcher with consent was able to take notes during observations of waste management practices. This non-participatory observation ensures that the researcher does not influence the observations captured in any way (Polit and Beck, 2008).

Measurements of weekly waste generation weekly were undertaken by repeat visits to the salons in order to understand the quantities of waste produced and how it relates to the observations made, for a two month period. The waste type and amount was measured by weighing it on digital scales. The information was then used to compare the waste generation volumes and rates between different salons and where the waste is stored. For these measurements, the researcher wore PPE to minimise any potential health and safety risks.

4.3.2 Qualitative data collection using semi-structured interviews

Interviews with salon personnel allowed for description of their lived experiences of waste management (Gwimbi and Dirwai, 2003). This included gaining insight and exploring the intersectionality of a complex phenomenon according to the subjective human experience (Burns and Grove, 2005). Semi-structured interviews allowed the different respondents to describe their understanding of beauty waste management practices and for the researcher to ask follow-up questions if needed. Respondents were asked to complete a consent form to confirm voluntary participation in the research. The interviews were held at a time and place convenient for the respondents. The interviews took between 15 and 30 minutes to complete, depending on the depth of answers, and were conducted in English or any language convenient for both the respondent and the researcher. In total 143 interviews were undertaken.

Due to COVID-19 regulations at the time of data collection, some interviews were conducted via Zoom/Skype for respondents who had access to technology. For other respondents, face-to face interviews were conducted observing strict COVID-19 protocols. The researcher prepared prompting questions to pose to the respondents. This allowed the researcher to ask follow-up questions which aided in making the findings richer (De Vos *et al*., 2013). The interview questions focused on the following themes: The amount and type of beauty waste generated; the number of clients weekly; how waste is managed in the salon; the challenges associated with the disposal, treatment, and recycling of salon waste; and recommendations of how the salon can improve its waste management practices. The questions related to both hair and nail treatment waste.

The study also considered the number of client visits in the salons, weekly for a two month period corresponding to the period of waste measurement. This was done by using the client attendance register held by salons, or the administrative documents salons use to track

business transactions. This information was obtained following consent from salon owners/managers.

4.4 Data analysis

The waste generated in each salon was recorded on a spreadsheet. This assessment can help identify whether the waste management practices of the different salons are in alignment with the Waste Management Act (No. 59 of 2008). For qualitative analysis of the interviews, thematic analysis was used (Braun and Clarke, 2006). This method entails the transcription of interviews and then coding different themes. The researcher transcribed the interviews, and read and re-read the transcripts to determine prospective themes. Initial coding of transcripts was then reviewed to inform the themes and sub-themes identified. The researcher also identified quotes during the interviews that complemented the major themes. This data analysis approach is suitable for the research design of the study (Frey *et al*., 1999). These themes are presented in Chapter 5. The following steps were undertaken in the analysis:

1. Study the data in detail,
2. Allocate preliminary codes to the captured data as a description of the content,
3. Assess for prominent themes in the data codes across the interviews,
4. Review the identified themes,
5. Define and finalise themes (Braun and Clarke, 2006).

The results were organised according to the prominent themes that emerged through the thematic analysis.

4.5 Ethical considerations

An application to the University Ethics Committee was made for ethical clearance prior to starting data collection. The ethics clearance number of this project is H22/03/18. The level of risk posed by the project was deemed to be minimal which means the probability and size of possible harm imposed to all respondents are not greater than risks imposed by daily life. Bhattacherjee (2012) introduces ethics as conforming to the standards of conduct as outlined by an authority or civil group. Written permission was obtained from all salon owners/managers before data collection took place. The researcher provided all potential respondents with an information sheet describing the purpose of the study, and invited them to ask questions regarding the study. This was to ensure that all respondents were aware of the study and what it aimed to achieve. This approach also empowered respondents to choose

whether or not they would like to participate. All willing respondents then signed consent forms agreeing to participate in the study. All respondents were adults over 18 years of age. The data provided by all the respondents was treated as confidential and anonymous, used only for the purpose of this study and destroyed after 3 years. Respondent codes were used for each participant (see section 4.1).

4.6 Limitations of the study

As with all research, this study has inherent limitations The study was conducted partly during COVID-19 conditions when not all beauty salon personnel were able to report to work (Stiegler and Bouchard, 2020). Therefore, shortages of staff may have led to the sample size of respondents to be narrowed along with the number of clients permitted in salons. This also limited access to waste facilities and undertaking face-to-face interviews. According to Creswell *et al.* (2003), validity refers to the extent to which the research results are a true reflection of what is happening in that situation. The results gathered from the interviews are regarded as authentic, however no authentication methods were applied to test if the respondents gave accurate information or not. Moreover, the researcher during thematic analyse may have introduced coding errors which may limit the quality of the findings. The study was restricted geographically to Rustenburg which may limit the relevance of the data in other geographical areas (discussed in Chapter 7).

Chapter 5: Results

5.1 Introduction

The results of this study from semi-structured interviews, measurements of waste in salons and researcher observations are presented in this chapter. Participant responses from interviews were screened and analysed using thematic analysis. The themes that emerged from the thematic analysis are:

1. Differences in waste generation amounts and types in beauty salons,
2. The waste management practices of beauty salons,
3. The waste management challenges faced by beauty salons,
4. Recommendations for addressing waste management issues in beauty salons, including wider ideas of environmental sustainability.

The results of the study are presented according to the above-mentioned themes, and are linked to the overall aims and objectives of the study.

5.2 Socio-demographic characteristics of the salons and respondents

Part of the aim of the research is to understand to what degree beauty salon personnel understand the impacts of waste on the environment. Socio-demographical characteristics give insight into the socioeconomic status of the beauty salons and how this may contribute to their understanding of waste and opportunities for waste recycling and reuse. The study involved 15 beauty salons located in Rustenburg and 143 respondents in total across different respondent categories from these salons. Of the respondents, 125 (87%) were female whereas 18 (13%) were male. The beauty industry globally and in South Africa is female-dominated (Diagonal Reports, 2011; Brouwer *et al*., 2023).

In terms of ages, as per Figure 13, 121 respondents (85%) were aged 18-30 while 17 respondents (12%) were 30-42 and 5 respondents (4%) were older than 42. No respondents were under 18 years of age. Figure 13 shows the age of respondents in this study across the different respondents categories. The study targeted respondents who had worked in beauty

salons for a year or longer. The reason for this is that the more experienced the respondents are, the richer their viewpoints on issues of waste management would be.

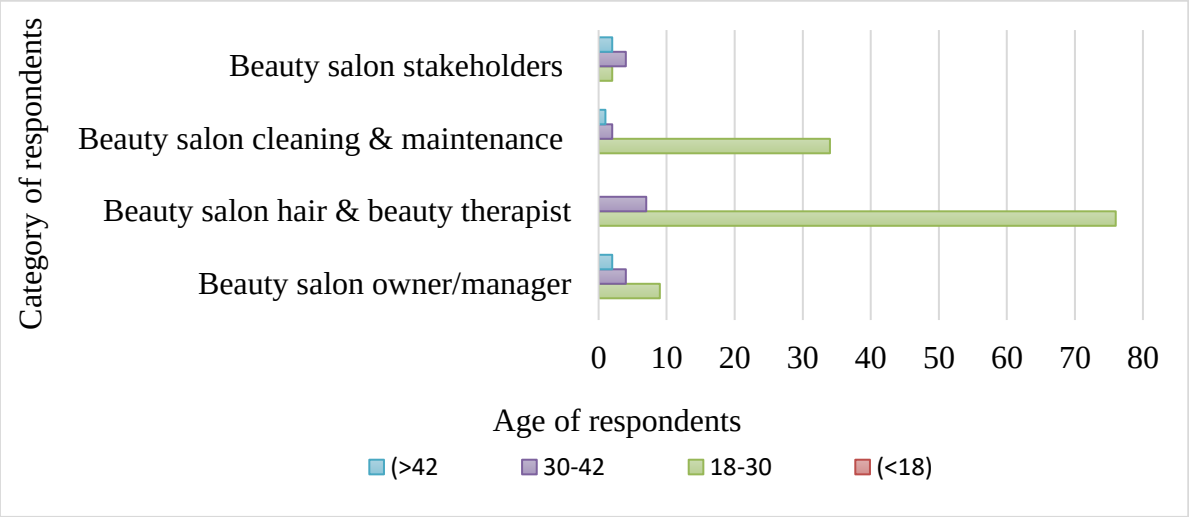

Figure 13: Age of respondents in the various beauty salons

The selected beauty salons are located in the busy CBD and the surrounding area of Lefaragatlhe in Rustenburg (Figure 12). It was crucial for the study to select salons that are located in a busy area with a higher cleintele. The salons in the CBD are more developed in terms of infrastructure and presumably have a better income compared to the salons in Lefaragatlhe that are slightly more marginal. The assessment of how well-developed a salon facility is was made by observations of the number and types of hairstyling equipment seen in the salon as well as the type of furniture used. The higher the number of hairstyling equipment such as mounted hair dryers and hair tong sets, the more developed the salon and the higher its income is considered to be. Furthermore, the salons that are more developed had salon mirrors, tables, chairs and kitchen units mounted on the wall and floor permanently. The less well-developed salons had movable items such as free-moving dryers and buckets of water rather than basins, and did not have permanently mounted furniture. There may therefore be disparities between higher income and more developed beauty salons and lower income, less well-developed salons. This may be reflected in the amount and type of waste produced in these salons and their waste management practices, which may be linked to socio-economic status of the salon and their clients. The development of CBD salons can be attributed to the high number of potential clients who pass more often in the busy street of the CBD, compared to the surrounding area of Lefaragathle.

All of the beauty salons examined in this study offer a range of services including hair and nail treatments. The hair treatments include hair washing, relaxing, cutting, perming, plaiting and scalp treatments. Nail treatments such as manicures and pedicures are offered in some salons. The salons in the CBD such as salons 1, 5 and 10 offer both hair and nail services while salons in the neighbouring area such as salons 3, 4 and 7 mostly specialise in hair treatments. The clients of the salons are mostly mine workers and community members of the town. Figure 14 shows the number of employees hired in the beauty salons as well as their gender. Salon 5 records the highest number of female employees whereas salon 13 has the highest number of male employees. The dominance of female employees may be because beauty salon treatments are mostly preferred by women who have longer or more intricate hairstyles and that men have a preference for shorter hair which can be treated at home. A female beauty salon owner (SO5) highlighted that it is interesting that females are represented in the beauty salon industry more than males and that more men are required to contribute to the diversity of skills that salons offer. Total numbers of employees vary from 2 (salon 3) to 14 (salon 13). This has implications for the variety of treatments offered, the number of clients that can be served, the income of the salon, and the amount of waste produced.

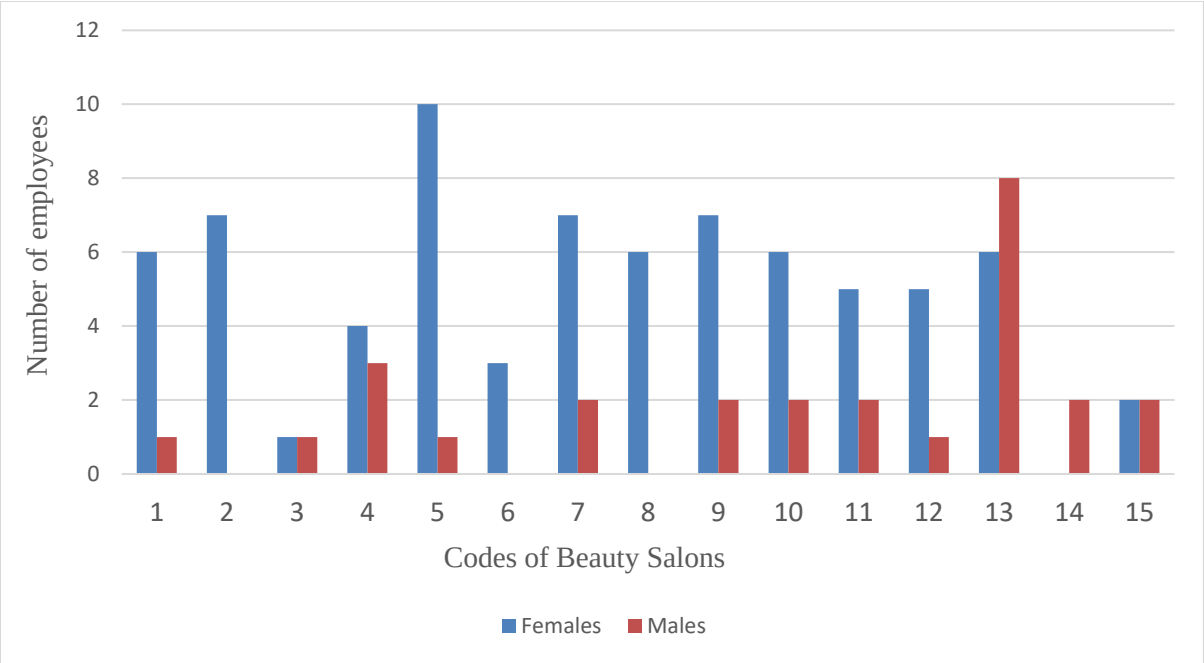

Figure 14: Salon personnel gender composition

5.3 The amount of waste produced in Rustenburg beauty salons

The first objective of the assessment was to determine the amount of waste produced by beauty salons. To achieve this objective, beauty salon waste was measured weekly over a period of two months and the results are captured in Table 7. Measurements were made by weighing the bagged waste products from the salons on a digital scales, in kilograms (kg).

Table 7: Weekly salon waste measurements over two months

	Month 1 Week 1 (kg)	**Month 1 Week 2 (kg)**	**Month 1 Week 3 (kg)**	**Month 1 Week 4 (kg)**	**Month 2 Week 1 (kg)**	**Month 2 Week 2 (kg)**	**Month 2 Week 3 (kg)**	**Month 2 Week 4 (kg)**	**Average waste month 1 per week (kg)**	**Average waste month 2 per week (kg)**	**Total waste produced in 2 months (kg)**	**Total waste produced annually (kg)**
Salon 1	5.6	5.4	5.0	11.3	6.1	5.3	4.5	11.1	**6.88**	**6.75**	**54.3**	**325.8**
Salon 2	6.8	4.6	4.0	7.1	5.2	5.8	3.4	8.1	**5.63**	**5.63**	**45.0**	**270.0**
Salon 3	3.5	4.1	2.1	6.5	5.7	4.2	4.3	10.1	**4.05**	**6.08**	**40.5**	**243.0**
Salon 4	6.6	3.5	2.7	8.2	6.1	5.9	5.2	9.3	**5.25**	**6.63**	**47.5**	**285.0**
Salon 5	6.3	5.1	3.2	10.1	6.2	3.6	7.3	10.5	**6.18**	**6.90**	**52.3**	**313.8**
Salon 6	4.4	3.4	4.3	5.6	5.5	10.2	9.3	9.1	**4.43**	**8.53**	**51.8**	**310.8**
Salon 7	6.5	4.1	5.1	10.2	2.8	11.2	10.1	8.5	**6.48**	**8.15**	**58.5**	**351.0**
Salon 8	8.1	3.6	6.4	10.6	4.1	6.2	5.2	11.3	**7.18**	**6.70**	**55.5**	**333.0**
Salon 9	6.3	4.7	5.8	11.5	10.2	6.2	6.3	11.3	**7.08**	**8.50**	**62.3**	**373.8**
Salon 10	5.2	4.8	4.5	8.5	6.3	5.3	3.3	7.9	**5.75**	**5.70**	**45.8**	**274.8**
Salon 11	8.5	4.6	7.4	9.8	7.8	5.2	4.2	10.2	**7.58**	**6.85**	**57.7**	**346.2**
Salon 12	6.1	4.2	5.7	9.8	9.5	2.1	6.1	8.2	**6.45**	**6.48**	**51.7**	**310.2**
Salon 13	7.5	6.2	6.0	11.1	10.4	5.3	4.2	11.3	**7.70**	**7.80**	**62.0**	**372.0**
Salon 14	5.6	4.1	7.2	10.2	7.0	6.2	5.2	9.2	**6.78**	**6.90**	**54.7**	**328.2**
Salon 15	3.6	3.7	6.5	9.3	5.1	5.8	4.9	10.2	**5.78**	**6.50**	**49.1**	**294.6**
AVERAGE (kg)	**6.04**	**4.40**	**5.06**	**9.32**	**6.53**	**5.90**	**5.57**	**9.75**	**6.21**	**6.94**	**788.7**	**4732.2**

5.3.1 Quantifying the amount of waste produced in beauty salon

The different salons combined produce a total waste amount of 4732.2 kg annually. Salons 1, 5-9 and 11-14 all produce a total waste of more than 51 kg weekly over two months. Salons 13 and 9 lead with 62 kg and 62.3 kg, respectively, produced weekly over the period. All the salons examined perform hair treatments and discard hair pieces, shampoo bottles and hair cream as waste. Most (11, 73%) of the salons perform nail treatments, producing nail powders, polish, glue, acetone and adhesive cyanoacrylate as waste. The equipment used in processing hair treatments such as hair dryers and combs are not disposed of so often, as they are reused on several clients. Five out of fifteen salons (33%) discard plastic disinfectant containers.

The majority of salons always had vinyl gloves and shampoo bottles in refuse bags which indicate that these are the most common waste products. The salons do not dispose of waste in equal amounts. The contributions of waste from the various salons for month 1, week 1 range from 3.5 kg (salon 3) to 8.1 kg (salon 8). Similarly for month 2, week 1 salon 3 contributed 5.7 kg and salon 8 contributed 4.1 kg. The results highlight that the amount produced varies weekly and by salon. The average waste produced by all the salons for month 1, week 1 is 6.04 kg whereas for month 2, week 1 it is 6.53 kg. Table 7 unpacks the varying amounts of waste for each salon. Salons 8, 9 and 13 produce the most waste weekly whereas salons 2, 3 and 10 produce the least waste weekly. The salon with the highest average waste for month 1 is salon 13 with 7.70 kg of waste, followed by salons 11, 8 and 9. The highest average recorded weekly waste amount is 9.75 kg in month 2, week 4 followed by 9.32 kg recorded for month 1, week.4. Week 4 in both months is when the highest amount of waste is generated for all the salons except for salons 6 and 7 which recorded 9.3 kg and 10.1 kg respectively for week 3, which is greater than the amounts generated in week 4. The salon with the least average waste for month 2 is salon 2 with 5.63 kg of waste followed by salon 10 with 5.70 kg. Five salons (33%) annually contribute less than 300 kg of waste while ten salons (67%) generate more than 300 kg of waste annually.

The minimum weekly waste produced was in a beauty salon was 2.1 kg by salon 3 (month 1, week 3) and the maximum was 11.5 kg by salon 9 (month 1, week 4). The total amount of waste produced is highest in salon 9 (62.3 kg) and lowest in salon 3 (40.5 kg). Assuming that the two surveyed months are representative of waste generation trends, this means that the total annual waste produced by the 15 salons is 4732 kg. By comparison, modelled values for waste

production by “lower middle income” citizens in South Africa is 0.79 kg/capita/day (Rodseth *et al*., 2020), giving a weekly value of 5.53 kg, which is very similar to the weekly values of waste produced by a single salon (Table 7).

5.3.2 Understanding the contributing factors to waste generation

The waste production of salons varies significantly as illustrated in Table 7 and this can be attributed the salon location, clientele, infrastructure and type of services. Week four in general has the highest waste generation. For example, salon 1 during month 1, week 1 produces 5.6 kg of waste which peaks at 11.3 kg for the same month in week 4. Similarly, salon 11 for month 1, week 1 produces 7.8 kg which increases to 10.2 kg for week 4 of the same month. This indicates waste generation peaks at week 4. A client mentioned that she does her hair at the end of every month and this can be attributed to end of the month being when the majority of people are paid. Table 8 indicates the type of services each salon renders which gives insight into why some salons may be producing higher waste amounts than others.

Table 8: The range of beauty services offered in the different salons

	Hair washing	Hair relaxing	Hair dying	Hair plaiting	Hair freestyles	Hair cuts	Scalp treatments	Manicures		Pedicures	
								Gel	Acrylic	Gel	Acrylic
Salon 1	√	√	√	√	√	√	√	√	√	√	√
Salon 2	√	√	√	√	√	√	√	√	√	√	√
Salon 3	√	√	√	√	√	√	√		√		
Salon 4	√	√	√	√	√	√	√		√	√	√
Salon 5	√	√	√	√	√	√	√				
Salon 6	√	√	√	√	√	√	√				
Salon 7	√	√	√	√	√	√	√				
Salon 8	√	√	√	√	√	√	√	√	√	√	√
Salon 9	√	√	√	√	√	√	√	√	√	√	√
Salon 10	√	√	√	√	√	√	√	√	√	√	√
Salon 11	√	√	√	√	√	√	√	√	√	√	√
Salon 12	√	√	√	√	√	√	√	√	√	√	√
Salon 13	√	√	√		√	√	√	√	√	√	√
Salon 14	√	√	√	√	√	√	√				
Salon 15	√	√	√	√	√	√	√	√	√	√	√

Beauty salons offer a range of beauty salon services which includes to hair plaiting, washing, perming and freestyles as illustrated in Table 8. The results indicate some treatments are more popular than others. The popularity of the service is indicated by the number of salons who offer the treatment. The most popular treatments offered by all (100%) of the salons are scalp treatments, hair-cuts, hair washing, relaxing, dying and freestyling. This means that salon waste mainly consists of relaxing products such as creams, shampoos, sprays, moisturisers and dying containers, which are all used in these treatments. Hair plaiting and freestyling are mostly done using hair pieces and this accounts for why hair particles are always found in salon waste. The amount of hair pieces found however varies according to how often these hair pieces are used, in accordance with the demands of the client.

As per observations, a considerable amount of hair waste was found in salons 8 and 9 which perform both hair and nail treatments, while no nail waste was observed from salons 5 and 6 as they do not perform nail treatments. Salons that perform both hair and nail treatments such as salons 15 and 13 produce greater waste amounts compared to salons 3 and 5 which do not offer nail treatments. This is an indication that waste amount and type is related to the types of salon services offered. Two beauty and nail therapists (BT15, BT7) mentioned the types of waste found in salons include a variety of nail powders, hair piece, acetone, shampoo containers, vinyl gloves and adhesive cyanoacrylate.

Beauty salons that predominately perform nail treatments have more nail products in their waste while beauty salons that perform both nail and hair treatments have a mixed waste composition and with higher total waste amounts. Salons that are well developed offer more services and produce more waste compared salons that are less well-developed. An assessment of how well developed a salon is was made by observations of the amount of hairstyling and other equipment seen in the salon. For example, salon 15 has more equipment such as wall-mounted dryers, hair tong sets and mounted wash basins, whereas salon 5 uses a bucket to wash clients hair and has free-moving dryers and no hair tong sets observed. Salons such as salons 8 and 15 also sell surplus stock or beauty and hair products and cosmetics direct to clients. Such resulting waste is not accounted for in the measured salon waste. A salon cleaner (SCM9) added that the types of waste produced in salons depends on whether or not the salon sells cosmetics or other beauty products. Moreover salons also produce ‘domestic’ waste, as clients and salon personnel consume food and discard other litter in the salon. Researcher observation

showed that well-developed salons produce steel, glass and aluminium can waste, while less-developed salons produce mainly organic materials, paper and plastics. Table 8 indicates that all the salons perform all services identified except salons 5, 6, 7 and 14 who do not perform nail treatments. Acrylic nails are performed in more salons (11) than gel (9), possibly because the latter may be too expensive for the lower-middle class workers who attend these salons. Treatments such as hair wash and relaxing are performed by most salons as these are viewed as basic hair treatments as stated by a salon owner (SO4).

Table 8 shows the treatments offered by the various salons and gives insight into what types of waste may be produced. To further examine why some salons produce more waste than others, the study gathered data on the estimated number of clients per week. This was based on examining their booking system and asking salon personnel (Figure 15).

Figure 15: Estimated number of clients per week in the different salons

There may be a correspondence between the number of clients and the amount of waste the beauty salon generates. Salons 10 and 11 have a higher number of estimated clients per week and respectively produce 45.8 kg and 57.7 kg of waste over two months, respectively; while salons 3 and 6 have a lower number of clients and produce 40.5 kg and 51.8 kg over two months, respectively. Clients are more likely to be attracted to salons that offer a variety of services than those that have a limited number of services. Salon 10 with a higher client estimate offers both hair and nail treatments as compared to salon 6 which does not offer nail

treatments and has a lower estimation of clients per week. The frequency of a client visiting a salon may depend on the services the salons offers, how often clients attend to their hair and nails, and how often the salons opens. The majority (14, 93%) of the salons open from Monday to Sundays and are closed on public holidays. Salon 15 indicated they open on some public holidays for limited hours due to the demand from clients. Salons with a higher number of clients per week therefore have a higher waste generation amount as illustrated by the trends in Figure 15 when compared to the trends in Table 7.

The popularity of the treatments preferred by clients and their associated waste determines the total amount of waste a salon produces, in line with its location and other waste generation contributing factors. The results note that some salons have their own unique trends and can be regarded as outliers to the general trends observed. For example, salon 3 does not have a high number of clients per week (6 clients) but produces 40.5 kg of waste over two months which is similar to salon 15 with a greater number of clients. It may be that salon 3 performs dreadlock haircuts which produce a higher volume of waste since dreadlocks are heavy, or that salon 15 performs more hair washes which result in low amounts of waste where a shampoo bottle of product is used more than once before it is emptied. Moreover, it may be that the clients of Salon 15 have natural treatments with fewer product applications, which produce less waste. When salon personnel were engaged during interviews it was clear some salons are aware of their waste generation trends and what influences their waste generation amounts. Most (53%) of the salons showed understanding of the approximate amounts of waste they produce and possible reasons for this, whereas other salons (47%) did not monitor waste generation amounts and trends as they do not consider it important.

5.4 Identifying the waste management practices of Rustenburg beauty salons

The second objective of the research was to identify the waste management practices of the beauty salons. This section will look at how salons manage the waste they generate. The waste management practices were assessed by asking beauty salon personnel about what is done to waste from the point it is produced, transported, handled and treated or discarded. The knowledge of current practices of waste management is necessary to contribute to better decision-making on waste management and environmental sustainability.

5.4.1 Establishing waste practices in beauty salons

Eleven out of fifteen (73%) salons mentioned they discard salon waste similarly to how they discard domestic waste in dustbins. Six salon cleaners said that their salon waste is kept in disposal bags in dustbins on site for collection by the municipality. One salon cleaner said that razors and scissors are separated from other waste. A salon cleaner from a different salon mentioned that even the razors are given to the municipality to collect with the other salon waste. The beauty salons were asked whether they recycle, incinerate or thermally treat waste. Most salons (67%) indicated they do none of the above and simply discard waste in dustbins and direct to landfill while three salons (20%) indicated that they sometimes compact cans and plastic bottles which they give to waste pickers who then take it to recycling companies in exchange for cash. The remaining salons (13%) were not clear and answered these questions indirectly. Overall, the results indicate that waste in the salons is essentially thrown in dustbins and collected by the municipality. Furthermore, if the municipality delays waste collection, most (93%) of the salons mentioned they burn the waste. Observations also show that waste is common along the streets around the salons. The respondents indicated that waste that cannot be easily burned such as bottles is commonly discarded in other places like rivers. This aligns with Kamara (2006) who stated that more than 50% of solid waste in African cities is discarded through illegal dumping in open fields and rivers as a result of lack of waste disposal infrastructure and service.

According to a salon cleaner (SCM6), the municipality lacks solutions to address waste management challenges and does not collect waste on a regular basis. The salon cleaner (SCM6) indicated that as a result of the inconsistent waste collection, she resorts to burning the waste or throwing it into open remote spaces to avoid stray dogs tearing open the refuse bags. The majority of respondents (93%) were not aware of alternatives to landfill disposal and burning of waste. One beauty salon owner mentioned that they drop off recyclables for waste pickers and not at a legal waste drop-off facility. Other salon respondents (45%) said that they would use a drop-off facility if their salons had a vehicle to transport the waste. Another respondent (SCM25) said that a drop-off facility takes away the responsibility of the municipality to collect waste, which they are mandated to do. This aligns with the results of Wang *et al*. (2018) that highlighted that the distance, from the waste generation point to a waste processing facility, has a significantly negative impact on waste management in less-developed areas. Salons that are less well-developed according to the researcher observations tended to

use illegal dumping compared to salons that were more developed. Futhermore, the number of clients of a salon were presumed to have an impact on profits and thus how developed the salon is in terms of its waste management infrastructure .If a salon is less well-developed, it led to a lack of effective management for waste storage or physical-chemical treatment. A salon owner, when asked about waste practices, said that salon profits is a major cause of the poor waste disposal practices observed in the salon. The owner stated that, for him as a start-up beauty salon, the main priority is financial survival rather than dealing with waste sustainably.

5.4.2 Evidence of waste management practices from civil organisations and researcher observations

Civil organisations from Rustenburg reported their impressions of waste management practices in beauty salons, based on their routine visits and other forms of engagement with the salons. The researcher also conducted observations in the beauty salons during data collection for interviews and when measuring the waste generated. Most of the civil organisations (68%) indicated that beauty salons store waste in refuge bags until the municipality collects it, which is once a week. Most organisations (75%) said that waste service delivery needs to be improved through ongoing engagements with the municipality. Only two respondents acknowledged that waste is often dumped in illegal dumpsites. Most organisations (54%) said that some salons reuse old containers for storing combs and other small equipment, which can be regarded as a practice that minimises waste disposal in dustbins. This was also observed by the researcher, but the waste volumes involved were negligible. Conversely, 46% of the organisations mentioned that waste is burned and some recyclable waste is taken by waste pickers. These respondents considered that there are socioeconomic constraints on recycling and reuse activities. The civil organisations did not mention any other waste management practices apart from discarding of waste, reuse and burning.

5.4.3 Examining the waste disposal practices in beauty salons

Observations made in salons indicate that disposing of waste in the dustbin or burning waste are seen as the norm and often the only viable options. The majority of salons (93%) do not directly engage in any other practices of waste management such as waste separation, recycling, compacting or waste treatment. When salon personnel including managers were asked whether they distinguish between different types of waste, 48% had a good

understanding of what waste separation entails while 15% mentioned that separating waste is a good practice, but none linked these practices to their salons. Several respondents (37%) indicated they have no awareness of what waste separation is and they mix all waste types together because the municipality does not insist on waste separation before collection. Other salons donate selected waste to waste pickers who then sell it to recycling companies. Salons do not recycle or treat waste in any way apart from burning it, especially when waste services from the municipality are not supplied. Most respondents (68%) did not understand what organic waste is, its benefits, or that it is produced in salons. A majority (58%) of respondents indicated that reuse of organic waste may be something that their salons should do in the future.

5.5 Exploring the challenges beauty salons face in relation to waste management

The third objective of the research explores the challenges that beauty salons face in relation to waste management. This includes the viewpoints of salon personnel and salon stakeholders (civil organisations) and any hindrances to implementing practices that align with the Waste Management Act (No. 59 of 2008). Respondents were first asked about their understanding of the term ‘waste management’. Five out of fifteen (33%) salon owners stated that waste management is the treatment, storage and transportation of waste as per the guidelines given by regulators. Two salon cleaners (SCM3, SCM21) defined waste management as the safe disposal of unwanted material while four out of eight (50%) salon stakeholders (SS1, SS2, SS5, SS8) stated it was the process of reuse, recycle and recovery of discarded material back into the circular economy. Across all respondent categories, 52% of respondents (74 respondents) spoke generally of waste types that they see in the trashbin without directly providing a definition of waste management. Thirteen out of fifteen (87%) beauty salon owners agree that most of the beauty waste ends up in illegal waste dumps, thereby having an adverse environmental impact. Most (53%) of the salons would like to discard beauty waste in an environmentally sustainable manner but consider the costs of implementing waste management systems high and therefore depend on government to provide effective waste management services for them.

Across all categories of respondents, 52% were not aware of the Waste Management Act or its requirements of beauty salons. These are the same respondents who were unable to provide a clear definition of the term waste management. A beauty salon owner indicated that a lack of knowledge of waste management results in apathy towards compliance and a general

unwillingness to participate in governance matters. The majority of respondents also alluded that waste management in all sectors including in salons is the responsibility of government. A salon owner said that lack of knowledge of waste management and ineffective actions from government are the causes of negative waste practices in salons.

5.5.1 Overview of waste management legislative challenges

A salon beauty therapist said ‘As much as the salon wants to be compliant, illegal dumping is the cheaper option as no advance waste facilities are required especially because the government does not assist salons with relief packages during tough economic times of COVID-19’. A salon client (SC4) pointed out in that salons are not able to pay for specialised waste services and the municipality must continue to provide these services. The salon cleaner (SO2) cited an unjust government coupled with unemployment as reasons for poor waste management practices and illegal dumping. A salon manager (SO5) indicated that government waste mitigation actions are not coordinated and lack effective partnerships with civil organisations and salons, hence salons are not compliant with waste management laws. Most respondents (85%) across different categories cited corruption in government as an obstacle to government providing salons with waste management facilities such as waste separation dustbins. The remaining 15% of respondents said that they do not receive quality waste services from the municipality but did not cite any reason to substantiate their response..

The majority of all categories of salon respondents (76%) said that they engage in illegal waste dumping because they do not receive adequate services from government. A salon stakeholder (SS5) observed that some salons complain about the non-collection of waste but that they do not put out their dustbins in time for municipal collection. Three beauty therapists (BT18, BT45, BT51) and one salon cleaner (SCM7) said that it is the government’s responsibility to facilitate sustainable waste management practices but that it is failing in its duties. Of all participant categories, 57% of respondents believe that there is little they can do to change the *status quo* of the local authorities who are unwilling to act in accordance with their responsibilities. Another salon stakeholder (SS2) highlighted that good relations between salons and the municipality do not exist and this is underpinned by a lack of effective communication.

5.5.2 Environmental and health challenges of beauty waste

Most (87%) salon personnel across various roles have an understanding of the impacts of waste and its relations to the environment, while only two out of 15 salons (13%) indicated that they left waste management entirely to local authorities. A salon cleaner (SCM12) referred to the risk of fires due to flammable salon waste such as nail acetone and hair cream, as the salons do not have storage facilities for waste and it is kept in the same room where salon treatments are performed. According to Ukpong and Udophia (2011) a refuse dustbin should be placed at least 20 m away from the place where waste is generated and where humans are active. The dustbins and refuse of the majority of the beauty salons are just a few meters away from the working station where hair and nails are done which makes the salon environment not hygienic and poses a health threat to workers and clients. A beauty salon therapist (BT31) said that beauty salon spaces are usually rented which means that managers would rent only enough for working stations and not for storage of waste.

Many (77%) beauty therapists described the environmental impacts of waste to pollution, greenhouse gas emissions and disrupted river flows due to waste being discarded in rivers. One beauty therapist said that salon waste can cause unwanted insects and odours which affect the health of salon workers and clients. Two salon cleaners talked about diseases and infections that can be contracted when dealing with waste without wearing PPE. A salon owner (SO6) and salon stakeholder (SS3) indicated that waste also deteriorates the aesthetics of the salon and it has a detrimental impact on business especially because they cannot afford to rent a big space where waste can be stored far from the salon activities. The salon environment therefore becomes unhealthy and also deters clients from the salon.. A salon owner (SO5) said that ‘environmental challenges such as poor infrastructure to store waste and the tough economic times of COVID-19 makes it more difficult for salons to overcome waste challenges’. The findings also indicate that salons receive little to no assistance from relevant authorities to provide waste facilities such as dustbins and refuge bags. According to a salon therapist (BT43), the government does not do much to build business sites that include areas for waste storage and processing.

5.5.3 Lack of knowledge and awareness of waste management

Legislation and the role of government is important in waste management, however, only one out of fifteen (7%) salon owners (SO3) had heard of the Waste Management Act (No. 59 of 2008) with the majority of all respondent (93%) being unaware of it. All fifteen salon managers agreed that there is a general lack of proper waste management practices amongst beauty salon businesses. When the management (owners) of salons are unaware of waste regulations governing the salons, it is unlikely that their employees will practice good waste management. This is confirmed by the majority of beauty therapists (57%) who stated that they do not know much about waste legislation and that no training on waste management was provided when they started their jobs. Nearly half of the beauty therapists (43%) said that the training they received was about how to perform hair and nail treatments and not about waste management. A salon cleaner (SCM28) said that the only training she received was about where the trash bins are located and how to keep the salon clean. Other respondents generally spoke about the Constitution as regards waste management legislation. As much as some salon personnel wanted to learn more about waste, a minority (20%) of beauty therapists did not want to learn more and were not interested in waste legislation, while 35% indicated that they may get involved in learning more about waste legislation depending on what incentives the salons and government could provide. This aligns with the study by Abila and Kantola (2019) who noted that 63% of the respondents in their study agreed that financial incentives are the main trigger of behavioural change, while 53% of respondents were keen to increase their knowledge about waste recycling regardless of incentives.

Four beauty therapists (BT3, BT5, BT20, BT29) and seven salon cleaners (SCM4, SCM9, SCM13, SCM18, SCM21, SCM24, SCM28) said that the issues of waste management in salons may result from lack of access to information. This corroborates with the beauty therapists who do not know much about waste legislation (57%), thereby showing that access to information and knowledge is a major challenge for beauty salons in adopting good waste management practices. A beauty therapist (BT21) suggested that the salon industry creates hundreds of jobs as a result of waste dumping which in turn boosts the economy. This indicates that limited or incorrect knowledge has an impact on waste behaviour.

The impacts of training and awareness are evident in the observations made by the researcher which showed that not all beauty therapists wear latex gloves when performing hair treatments. This is necessary when working with flammable and corrosive waste chemicals such as hair creams and nail acetone to protect skin from inflammation and rashes. Less than half (43%) of

beauty therapists used gloves every time the researcher was making observations. This appeared to be directly related to how knowledgeable the beauty therapist was of waste management systems. The 57% of beauty therapists who did not use gloves also forms part of the cohort who were not able to define waste management and knew little about the waste Management Act. This indicates that awareness and education influence the practices and methods of waste disposal used in the salons. A lack of adequate training also results in health and safety issues. A correspondence between knowledge of legislation, waste management systems and implementation of good practices was noted. More knowledgeable salons tend to endorse environmental sustainability as opposed to non-knowledgeable salons. The findings also suggest that salons with less knowledgeable personnel did not express enthusiasm to engage in waste management in the beauty salon. Moreover, developed salons such as salon 14 with more infrastructure and knowledgeable staff were more aware of beauty product ingredients and their environmental impacts. Salon 14 personnel seemed keen to promote more awareness on waste beauty products to address waste management challenges in the beauty salon fraternity.

5.5.4 Waste management challenges identified by civil organisations in beauty salons

A civil organisation stakeholder (SS6) acknowledged that financial constraints that beauty salons face, partly related to COVID-19 restrictions, had a big impact on beauty salon operations in general. Waste management services during the COVID-19 pandemic was also a challenge as waste collection frequency was reduced, coupled with the salon cleaning and maintenance personnel who had to be retrenched as a cost-cutting activity at this time.

5.6 Stakeholders' recommendations to improve waste management practices in beauty salons

The fourth objective of this research was to make recommendations on how beauty salons can improve their waste management practices. The results indicated that the current waste disposal practices of using dustbins and burning waste are not sufficient. Alternatives including recycling and reuse are viable in salons and can promote sustainable environmental practices, but are not undertaken. This section will highlight the recommendations made by beauty salon personnel and beauty salon stakeholders (civil organisations).

5.6.1 Waste management recommendations from beauty industry civil organisations

Environmentally sustainable recommendations are required in the beauty salons in light of the poor waste management practices observed in salons, such as discarding all types of waste in dustbins irrespective of whether the waste can be recycled or not. A civil organisation respondent (SS3) stated that much should still be done to improve waste management practices in beauty salons. A different civil organisation respondent (SS4) mentioned that efforts from government are required to provide waste facilities and services to beauty salons. In addition, 87% of civil organisation respondents mentioned that investment in salon facilities will aid them in storing and recycling waste. Another respondent (SS2) mentioned that beauty salons do not cite lack of storage and facilities as challenges and that decreases their accountability for poor waste management practices. Municipality waste collection must be done regularly to prevent salons transporting waste to remote facilities using vehicles that are not fit for purpose. A respondent (SS5) said that salons also need to take responsibility for recycling and that continued engagement is needed between salons and government to address waste compliance apathy (respondent SS8). Although waste collection in South Africa is the legal responsibility of municipalities, the participation of beauty salons in waste management is cited as more relevant and critical by all civil organisation respondents. In general, the civil organisation respondents recommended that salons should reuse recyclables and invite experts from recycling companies to give them information on recyclable products and services. All civil organisation respondents also mentioned that beauty salons should attend municipality and council meetings where decisions are made about local waste management.

5.6.2 Waste management recommendations from beauty salons

The majority (87%) of salons acknowledged that the growing beauty demands by clients necessitates that they take informed decisions on waste management. Five out of fifteen salon owners/managers (33%) indicated the importance of understanding the amount and types of waste their salon produces. All of the salon owners stated the importance of salons in waste management to reduce environmental impacts such as pollution. They also agreed that the government should ensure that salon practices are aligned with legislative waste requirements through ongoing monitoring. A salon manager (SO3) stated that the Department of Environmental Affairs from a local, provincial and national level has the responsibility to

implement the Waste Management Act and all other relevant waste guidelines. If there is increased waste production, municipalities will have to provide waste collection, transportation and disposal services to ensure that this does not result in further illegal dumping. In contrast, one salon owner indicated that illegal waste practices can present short-term savings, but can result in penalties and fines if caught by authorities. Some (22%) of all respondent categories said that the focus should be on accountability and using technology, recycling, reuse and recovery of waste. A salon cleaner (SCM6) said she wants to partner with recycling companies and government but when she approached authorities for assistance, they did not take her concerns seriously and did not respond to queries.

One salon owner (SO5) narrated a story of a friend who sells recycled waste such as steel, bottles and cans. The salon owner indicated that selling recyclable materials can boost the salon's profits while also protecting the environment. This reinforces the idea that salons can extract value from waste. Most (65%) of the respondents indicated that government could provide them with facilities and machinery to compress waste volume for easier transport and storage. Increased cooperation between salons, the private sector, civil organisations and government may also help develop innovative solutions for waste issues. A salon owner (SO8) indicated that recycling represents the best use of the resources available. A beauty salon therapist (BT34) said that salons should compost organic waste to generate other product. A salon owner (SO6) said that it is crucial when operating a beauty establishment to think of the responsibilities of safe waste disposal and what can and cannot be recycled. The salon owner (SO6) furthermore elucidated that beauty salons should be familiar with the principles of recycling (Figure 7) and use this as a guide for recycling practices. The salon owner (SO6) attributes her respect and care for the environment as pivotal to her realisation of the importance of waste management. This highlights that waste management behaviour is driven by numerous factors which can include an individual's background, education and societal norms. Another salon owner (SO14) highlighted that the salon's attitude towards waste is determined by their level of awareness of environmental issues, and that public participation and education can change the negative waste management practices by salons.

Chapter 6: Analysis and Discussion

6.1 Introduction

This chapter analyses the results of the study and then discusses them in light of wider concepts in waste management. The waste management practices of beauty salon personnel will be explored. These practices, based on the results presented in Chapter 5, are diverse and the amount of waste produced varies between the different salons. The results will be discussed in terms of: (1) the socio-demographic characteristics of respondents and salons in this study, (2) the amount of waste produced in the selected beauty salons, (3) the salon waste management practices, (4) the challenges that beauty salons face in relation to waste management, and (5) the recommendations of stakeholders to improve salon waste management practices.

6.2 Socio-demographic characteristics of the study respondents and salons

Socio-demographic factors (gender and age) of salon personnel may influence their attitudes, behaviour and practices in relation to waste. There appeared to be no significant relationship between gender and waste management practices. This may be as a result of all the salon personnel influencing each other's behaviour, whereby what is practiced is seen as acceptable and as the norm by all salon workers. This contrasts with results from Ehrampoush and Moghadam (2005) and Mukherji *et al*. (2016) who show that gender can influence waste management practices. However, these studies were concerned with household waste management, not waste from work and industrial environments.

The results indicate that disparities exist between high-income and well-developed beauty salons, and low-income, less well-developed beauty salons. The development of salons was evaluated by observations in relation to infrastructure, equipment and the number of clients. This is logical because infrastructure development in salons requires capital investment and a high enough income supported by a larger number of clients. The CBD location of the selected salons is a busy economic space and therefore these salons are well placed to attract clients. The socio-economic demographics of the locality therefore have an influence on the development of the salons. The results also noted that that the amount of waste produced in the salons is different linked to their socio-economic status. More clients and more complex and expensive treatments mean more products being used and therefore more waste.

6.3 Waste production in the beauty salons

The results indicate that the amount of waste generated by salons is highly variable (Table 7). The minimum weekly waste produced was 2.1 kg by salon 3 (month 1, week 3) and the maximum was 11.5 kg by salon 9 (month 1, week 4). The reasons for the different amounts may include salon location, number of clients, types of services rendered, and the frequency of waste collection services. Results from the observations and interviews suggest that all of these factors may be important in determining the amount of waste produced and the general waste management practices of salons.

6.4 Salon waste management practices

This section is aligned with objective three of the research which seeks to identify the waste management practices of the selected beauty salons. Data in relation to these practices were captured by interviews with different salon respondents.

6.4.1 Waste management practices from the perspective of beauty salon personnel

The results highlight that beauty salons mainly discard all waste in dustbins, by burning, or dumping it at illegal waste sites. Illegal dumping is considered to be one of the most common waste management challenges in South Africa (Godfrey and Oelofse, 2017). More knowledge is therefore required regarding alternative disposal, reuse or recycling methods for different types of salon waste.

Burning of waste at the salons and not at municipal incinerators implies that the salons do not understand that their practices are not aligned with municipal regulations. This is also done without salons considering the toxicology of ingredients used in hair creams, sprays and acetone liquids which, when discarded in sites prone to fires, can spark easily due to their corrosivity and flammability properties. Greater awareness of chemical ingredients in salon products can encourage changed behaviours and a preference for natural products with lower waste, carbon and water footprints.

The results indicate that no beauty salon in this case study recycles waste but some is donated to waste pickers for recycling. Beauty salons are not aware that not all waste should be discarded. Innovation is also needed in dealing with some waste types, such as mailing back

used razors to the manufacturing company for safe recycling and/or disposal. The results show that the majority of beauty salons do not practice alternative disposal methods of waste such as incineration and waste separation. The results noted few differences between the beauty salon respondents who attempted to separated their waste and those who did not separate their waste and did not understand what waste separation entails. This implies that much can be done to inculcate good waste practices in beauty salons understanding waste management concepts and the requirements for different waste types.

6.4.2 Waste management practices from the perspective of civil organisations and researcher observations

The evidence provided by civil organisation respondents and from researcher observations corroborates with the main findings captured from beauty salon personnel. Most of the civil organisation respondents (68%) stated that salon waste is discarded in refuse bags and kept in storage for municipal collection, which is consistent with the evidence provided by eleven out of fifteen (73%) salons who said that they discard salon waste into dustbins. Civil organisations may have an important role in facilitating agreements between government, trade unions and employer organisations to assist beauty salons with environmental management services. The work of the National Bargaining Council may be relevant where beauty salons require bargaining for funding to address their environmental challenges.

It was also mentioned by civil organisations that some waste is burnt which indicates that there is room for better approaches by converting waste into beneficial and useful products and energy. Salons need to be aware that some products and waste cannot be disposed in the dustbins as they have hazardous properties such as acetone which is found in nail polish removers and hairspray. Solvents such as toluene is present in nail polish, nail glue, hair dye and wig glue and if disposed of in dustbins within the reach of children can result in skin burns and other adverse effects. On a positive side, 54% of civil organisations said that some salons reuse old containers for storing small equipment but this has overall minimal impact on waste volumes. This indicates that there are opportunities for beauty salons to adopt informed environmental decisions by using products with biodegradable packaging and reusable properties. The Life Cycle Analysis of products and the Circular Economy (Figure 9) should be considered by salons as a way to understand how product materials and waste can be used and transformed.

6.5 The challenges hindering effective waste management practices in beauty salons

The results indicate that lack of awareness and knowledge contributes to the poor waste management practices of the beauty salons. Respondents lack adequate knowledge on waste properties, waste separation at source, recycling and waste conversion into energy. This explains why waste management in beauty salon is a pressing concern and why this research is important in exploring solutions to this problem. The challenges of lack of waste service delivery impacts negatively on the governance of landfills and results in illegal landfills being created by communities who do not get quality waste services. Identifying the complexities of the challenges faced by beauty salons is therefore crucial in developing effective waste management strategies.

6.5.1 Legislative, awareness and environmental challenges faced by beauty salons

Lack of understand of waste management laws and regulations can contribute to the apathy about compliance that is indicated in the results. Beauty salon personnel need to made aware of waste issues. Beauty product manufactures usually have a customer service line which can be used in conjunction with other alternatives to gather additional information about the ingredients of a product in order to understand its waste impacts. Salon personnel should avoid exposure to harmful chemicals as per the Safety Data Sheets. Beauty salons must be informed of the harmful chemicals found in beauty products. The state and its agencies are mandated to uphold, protect, and promote environmental rights. NEM:WA provides the foundation of a framework for regulating waste management issues in South Africa. The lack of enforcement of laws and the monitoring thereof may account for why some respondents view that waste management is not their responsibility but instead that of the government.

The results indicate that some beauty salon personnel have knowledge about waste management whereas others lack awareness of the issue. Although many respondents were able to define what waste management is, this did not translate into effective waste management practices within the salons, such as recycling instead of disposal of waste in dustbins. It is not clear why this is the case. However, it is necessary for beauty salon personnel to understand the implications of poor waste management in terms of water and air pollution, and to understand their role as professionals and as environmental citizens. The two roles

cannot be divorced as environmental compliance is key to beauty salons obtaining licences to deal with hazardous waste that requires special methods of handling. Innovation and technology coupled with ongoing engagements amongst all beauty salon stakeholders is the key to identifying and addressing these challenges.

6.6 Recommendations to improve waste management practices in beauty salons

The results noted that recommendations made by beauty salon personnel as well as beauty salon stakeholders (civil organisations) are premised on the same idea of innovation, collaboration and cultivating good relations between the government, municipalities, stakeholders and beauty salons. The recommendations made must be implemented at different spheres of government and by different stakeholders such as industry federations, however it is noted that public awareness programmes and an enabling infrastructure are also required. Services and practices exist to enable small businesses such as beauty salons to conform to environmental standards. For example, the Small Enterprise Development Agency (EDA) is an initiative of the Department of Trade and Industry that provides small businesses with funding and training through its national network in partnership with the private sector. Funding from EDA can assist beauty salons with funding for waste bins for separation of waste and the purchase of other waste facilities. The North-West Environmental Group is also available to assist businesses such as beauty salons with their environmental management needs through consultancy.

In addition, alternative waste disposal methods such as recycling and incineration should be emphasized in beauty salons to minimise waste being discarded and negatively impacting the environment and ecosystems. The aforementioned practices will not only enhance the environment but the image of the beauty salons and the quality of the services rendered. Awareness and knowledge is at the heart of the recommendations made by civil organisations and beauty salons, however this must be accompanied by practical solutions with clear instructions on waste minimisation in order to yield an increased probability of behavioural change. Beauty salon management must have regular training about environmental and waste management topics with its staff. The salon personnel who are willing to practice good environmental citizenship must be educated on where waste drop-off facilities and receptacles are located.

Chapter 7: Conclusions

7.1 Introduction

This final chapter discusses the research results and identifies how the objectives of the study have been achieved. The chapter will first reflect on the literature review and preceding chapters of the research in order to account for the contribution of each chapter towards the attainment of the research aims and objectives. It will then discuss the empirical results of the study. The chapter will conclude by making recommendations for future research while taking into consideration the limitations of the study.

7.2 Understanding the theoretical aims and objectives of the study

The study was inspired by the mounting concerns of the environmental impacts of beauty salon waste. In light of these concerns, this research aimed to understand how beauty salon waste is discarded at salons in Rustenburg and to what degree salon personnel understand the impacts of waste on the environment. The majority of beauty salon personnel were able to explain the general impacts of waste on the environment and are aware that effective waste management is needed. Investigation of waste disposal within salons formed the basis for understanding waste management practices undertaken in salons on a daily basis. The first objective of this research was to determine the total amount of waste produced by beauty salons. This objective was achieved by measuring the amount of waste produced weekly over a period of two months. The second and third objectives were to identify the waste management practices of the beauty salons and their challenges. The results identified that discarding waste in dustbins for municipal collection is the most common practice. When the municipality fails to collect the waste, it is discarded by salon personnel in open fields, rivers or burnt in unregulated sites. The fourth objective was to identify recommendations of how the salons can improve their waste management practices. This requires salons, civil organisations and government to work together on education and training, and to develop sustainable waste management practices. Investment was recommended by civil organisations while the beauty salons emphasised that the government needs to assist them with the provision of waste facilities and dustbins, as well as provide regular waste collection services. Collaboration amongst all the relevant stakeholders and promotion of awareness campaigns are part of the recommendations made.

7.3 Reflections on the chapters and literature review of the study

The first chapter provides an introduction of the study and also provides a South African perspective of the beauty salon industry. The problem statement is identified with aims and objectives. The literature review (Chapter 2) introduces beauty as being integral to the physical image, whether beauty is expressed in clothing, hair or nails as a means of self-expression. The literature review further advises that beauty salons as waste generators are required to engage in the processes and actions of managing waste from its inception to its final disposal. This relates to the first objective of the study. The literature review then considered the legislative framework of the Waste Management Act (No. 59 of 2008) in South Africa. It then described the different beauty salon treatments and services offered as well as the production of hazardous beauty waste. The major results of the study (Chapter 5) address objectives 2 and 3 in describing how the waste practices and issues from the selected salons, using both measurements of waste produced and through interviews with salon personnel and key stakeholders. From this, Chapter 6 considered how beauty salons may improve their waste management strategies, including working collaboratively with all government and civil stakeholders. This addressed objective 4.

7.4 Conclusions on the empirical results of the study

In this section a discussion and a reflection of the results will be presented. The results in Chapter 5 concluded that the socio-demographic characteristics of the beauty salons contribute to understanding what factors may lead to certain waste management practices in the salons. Futhermore, it concluded that different salons produce different amounts of waste and the combined measured waste for all the salons annually translates to 4732.2 kg. The results also identified the salon waste management practices to be premised on (1) discarding waste in dustbins for municipal collection, (2) burning waste when service delivery is a challenge, and (3) dumping waste in illegal dumpsites if waste is not collected by other means. Lack of knowledge and awareness of waste and pollution issues accounts for the adopted practices as well as lack of enforcement of rules and regulations by authorities. Collaboration amongst all relevant stakeholders is recommended to address waste challenges as well as the provision of waste facilities to salons. Waste awareness programmes are necessary to combat poor waste management practices in the beauty salon industry.

7.5 Limitations of the study and recommendations for future research

The limitations of the study are acknowledged. The study was conducted partly under COVID-19 regulations and this may have had an impact of the quality of data captured. The study looked at beauty waste management practices of only beauty salons and not of barbershops or other beauty establishments that may be producing similar waste, and therefore more research can be done which looks at beauty waste more broadly and not only in beauty salons and in Rustenburg only. The sample of salons was limited to 15 beauty salons from the CBD. It did not consider other types of salons in informal settlements where waste management practices may be less well regulated. A detailed study with a greater sample size and incorporating a wider region may contribute to broader knowledge about waste management practices in the beauty salon sector. The case study of Rustenburg, however, forms a good baseline for other researchers to conduct further studies. More research in the beauty salon sector is needed as the sector continues to grow.

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