

**BA-PHALABORWA MUNICIPALITY
RECYCLING STRATEGY**

Recycle
FOR ALL ITS WORTH

One piece of garbage in a recycling container makes it all garbage!

PUT GARBAGE IN ITS PLACE



**BA-PHALABORWA
MUNICIPALITY**

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BACKGROUND

The name Ba-Phalaborwa was given by the Sotho tribes which are indigenous to the area. Ba-Phalaborwa is a mining town, the massive open pit mine is Africa's widest man-made hole at +/- 2,000 meters wide. Ba-Phalaborwa Municipality is primarily a rural medium capacity local Municipality with a population of approximately 188603. Ba-Phalaborwa Local Municipality is made up of townships and villages (Phalaborwa, Lulekani Township, Namakgale Township, and Gravelote). It is situated in the north-eastern part of Mopani district, just less than a km from the Kruger National Park border. The area has vast tourism and manufacturing investment opportunities and has a geographical area of +/-7500 km squared including the Kruger National Park.

Waste management in the area is currently in a compromised position, as the current landfill is due for closure and waste management activities are burdened by various institutional factors including inadequate fleet, shortage of personnel and financial constraints. Recycling is a viable option as the area consists of a variety of economic activities that contribute tremendously to waste generation, there a currently a number of recycling companies that recover the bulk of recyclables at the landfill site, but opportunities still exist in certain areas. The municipality has taken strides to facilitate effective waste collection and material recovery, as current waste collection extends to both urban and rural communities.



Figure 1: Map of Phalaborwa areas.

INTRODUCTION TO RECYCLING IN PHALABORWA

The National Environmental Management Waste Act (NEMWA) (Act 59 of 2008) defines recycling as a process in which waste is recovered for further use. This process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.

Waste reduction is mostly driven by the manufacturing and retail sectors, and it can be accomplished by reviewing product and packaging design to reduce the amount of material consumed, as well as by using returnable packaging such as beverage bottles. Waste recycling often occurs in the post-consumer phase of a product's life-cycle and is heavily influenced by consumer behavior and the availability of recycling services and facilities.

The municipality understands that waste reduction will help preserve resources and that the implementation of circular economy thinking will have cascading benefits, both upstream and downstream, through the type of product chosen and the waste diverted.

To manage waste in Phalaborwa, BPM currently follows the waste hierarchy of prevention, reduction/minimization, reuse, recycling, and the least preferred options of responsible disposal.

The waste hierarchy is however based on end-of-life options rather than the full environmental impact considered across a life cycle. It mostly does not account the context in which management takes place. E.g. recycling cannot take place unless recycling schemes exist or the material is recyclable.

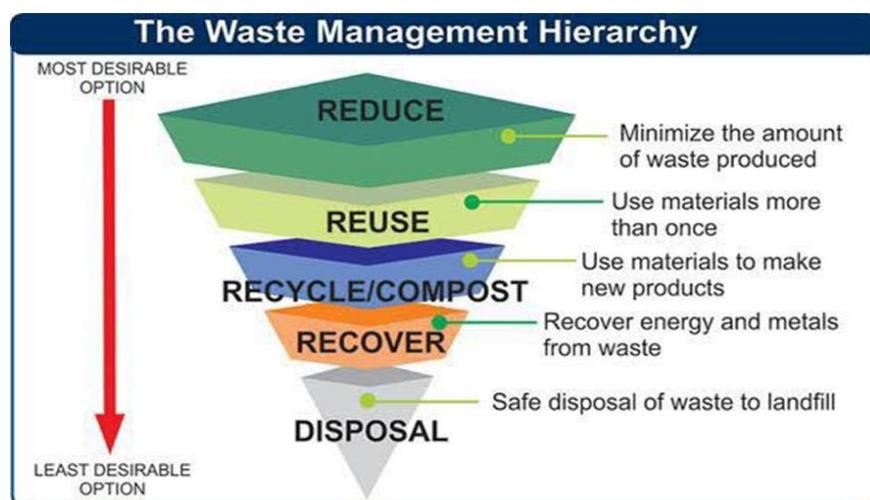


Figure 2: a hierarchy showing the most to the least desirable options of waste management.

The practice of recycling waste material in Phalaborwa commenced in the mid-1980s. This was when the small scale vendors collected cardboard boxes for the Global Renewable Resource Company that uses every part of the tree to make every day more sustainable.

Currently the recycling system has enhanced to recycling not only cardboard boxes but also recycling aluminum cans, papers, plastic, glass, ferrous and nonferrous materials, and organic material.

The Ba-Phalaborwa municipality has thus far placed skip bins in remote areas so waste is reduced in households. The municipality collects these skip bins on schedule, so overflow of these skip bins is reduced. BPM has also piloted two more rural areas namely (Makhushane & Mashishimale) for refuse collection which leads to more waste reduction in residential areas around these areas. BPM has placed bins and skip bins in all wards around Phalaborwa with the aim to reduce littering and improper waste disposal.

Furthermore, the municipality has collaborated with local businesses namely Komatsu, NN Metals, UEP Engineering, LH Martins engineering and RE-EMI oils (Castrol) to place bins all around Phalaborwa and in schools for the “adopt a school campaign” that is to be launched with the aim to encourage residents and learners to recycle.

Along with this initiative, plans are underway to increase recycling activities at communal level. This will be done in partnership with Thinavhuo Recycling Company, wherein competitions will be organized at schools, taverns, social gathering points and community facilities to enhance recycling activities in the area and promote general cleanness and environmental consideration.

IMPORTANCE OF RECYCLING

Recycling plays a critical role in achieving environmental goals by conserving resources, reducing energy consumption, minimizing pollution, and diverting the amount of waste going into the landfill site in Phalaborwa. However, it reduces the use of natural resources by reusing materials. It helps conserve natural resources by reusing them instead of extracting new ones and increasing manufacturing costs. Recycling also helps mitigate soil and water pollution, preserving ecosystems and biodiversity. Overall, recycling is essential for sustainable resource management and mitigating environmental degradation. Recycling can create significantly more jobs than simply disposing of waste to the landfill site.

PROBLEM STATEMENT

Phalaborwa has a high percentage of occupants who generate excessive amounts waste daily. The strain on Ba-Phalaborwa landfill site is exacerbated by the fact that the municipality's waste collection schedule only caters for accessible areas. This is because a high percentage of residents reside in rural areas or small settlements which are located far from the Ba-Phalaborwa landfill site and have poor road infrastructure which renders them inaccessible by the refuse collection truck. Phalaborwa is a local municipality with a large town as a core which has major waste generators namely: the mining houses, businesses in the CBD, all households, and learning institutions.

Material recovery in Ba-Phalaborwa is a serious issue that ultimately disadvantages and burdens recycling activities, effective waste disposal, and waste management activities in the area. Ba-Phalaborwa Local Municipality has a significant lack of recycling data available. This document aims to improve waste recycling data collection and management for Ba-Phalaborwa Local Municipality.

HISTORY OF RECYCLING STRATEGY IN BA-PHALABORWA MUNICIPLITY

This is the first recycling strategy developed at a local level in the area. Other Local municipalities do have recycling programs in place which will also serve as a point of reference for Ba-Phalaborwa municipality.

OVERVIEW OF WASTE MANAGEMENT IN BA-PHALABORWA

The areas within Ba-Phalaborwa Municipality are undergoing a wide variety of challenges ranging from inappropriate disposal sites, lack of collection equipment and limited number of workers. The challenges include limited public awareness about the service or non-compliance by the public regarding various norms and standards about recycling. There are limited advocacy opportunities for waste management. The municipality's efforts to guarantee that there are recycling initiatives that connect neighboring communities are not well coordinated.

Ba-Phalaborwa landfill site has reached its full capacity due to lack of operational maintenance plans. The damaged fence in certain areas of the landfill facilitates dumping of waste by providing easy access for individuals. The Municipality has embarked on an initiative of opening a new landfill site for facilitation of effective waste management.

There are several recycling companies around Ba-Phalaborwa Municipality and three are partnered with Municipality which are Thinavhuu Recycling, Bollanoto Secondary Co-operative, Zenompilo

Recycling. These businesses process a wide range of recyclable materials, including plastics, cardboard boxes, glass, paper, bottle caps, aluminum cans, and tetra-pak. Each enterprise faces its own set of difficulties and opportunities, which contribute to the particular dynamics of Ba-Phalaborwa's recycling sector. Independent recycling companies include NN Metals, Phalaborwa Recycling, RECLAM Recycling which contribute significantly to the Ba-Phalaborwa recycling ecosystem by recycling car batteries, tyres, ferrous and nonferrous metals

Zenompilo Recycling faces challenges such as inadequate infrastructure, intense competition, gender inequalities and transportation constraints. Nonetheless, the company endures, producing 80 tons of recyclables per month and employing approximately 10 people. Thinavhuu Recycling is one of the largest recycling companies in Limpopo, with over 81 employees. It recycles at both the Phalaborwa Mining Company's landfill and the Ba-Phalaborwa landfill. The challenge includes transportation. Similarly, Bollanoto Secondary Cooperative confronts transportation-related issues. Nonetheless, the company continues to operate, producing over 80 tons of recyclables per month and employing more than 100 people, albeit with a variable staff due to job prospects elsewhere. NN Metals has achieved impressive progress while facing hurdles such as power outages, criminal activity, transportation issues, and deteriorating infrastructure. The company employs roughly 60 people and produces 1000 tons of recyclables every month, considerably contributing to local jobs and trash management initiatives.



Figure 3: unsorted recyclable waste disposed at the Phalaborwa Landfill site

THE SCOPE OF WORK OF BA-PHALABORWA RECYCLING STRATEGY.

The scope of work for this strategy:

- Provide a workable and fundamental institutional framework for the transportation, infrastructure and first market stimulation of recycled goods.
- In order to achieve socio-economic and environmental sustainability within the municipality, it is necessary to identify and eliminate any impediments and obstacles that stand in the way of reaching efficient recycling levels.
- Provide a framework for information sharing between government sector departments at the local level and industrial sectoral organizations in order to establish targeted recycling programmes and promote their wider adoption.

Ba-Phalaborwa received recognition for its cleanliness due to community initiatives, Local Municipality efforts or environmental stewardships programs.

GOALS AND OBJECTIVES FOR THE BA-PHALABORWA LOCAL MUNICIPALITY RECYCLING STRATEGY.

CATEGORY 1 GOALS: SUSTAINABLE PRACTICES

- To support the use of environmentally friendly waste disposal technology.
- Increase the diversion of recyclable materials from landfill disposal to reduce environmental impacts and conserve resources.
- Improve recycling infrastructure including collection systems, processing facilities and public education resources to support efficient recycling operations.
- To improve productivity for Ba-Phalaborwa farms, gardens and landscapes while reducing greenhouse gas emissions and increasing local food security.

CATEGORY 2 GOALS: ENVIRONMENTAL AWARENESS

- To encourage environmental education and awareness in communities, especially since they are the primary waste generators.

CATEGORY 3 GOALS: INTSITUTIONAL GOALS

- To be a department that is completely capable of providing its services efficiently and effectively.
- Foster a culture of environmental responsibility and sustainability within the municipality by promoting recycling and waste reduction practices.

- To create sustainable livelihoods through waste recycling (waste collection and minimization).

CATEGORY 4 GOALS: SOCIOECONOMIC GOALS

- A healthy environment will provide increased socioeconomic advantages and job development for current and future generations through recycling and other environmentally conscious activities.
- To create job opportunities for youth in the rural areas of the Ba-Phalaborwa municipality.

LEGISLATION REQUIREMENTS FOR THE RECYCLING STRATEGY

- **The south African constitution , 1996 (Act 108 of 1999)**

Section 24 of the bill of rights of the constitution of south Africa states that: everyone has the right to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources.

- **National Environment Management Act (107 of 1998)**

This law sets out the legal framework for environmental management in South Africa. It addresses various aspects of environmental protection, conservation, and sustainable development.

- **National domestic waste collection standards (GN 21 of 2011)**

This standards aims to provide a uniform framework within which domestic waste should be collected in South Africa to address the past imbalances in the provisional waste services. The standards aim to guide municipalities on how to provide acceptable, affordable and sustainable services to the human health and the environment.

- **Waste act (act 59 of 2008)**

Section 11 of waste act. States that the department and the provincial departments responsible for waste management must prepare integrated waste management plans. The act encompasses all aspects related to waste and waste management. It is the intention of this act to provide for national, provincial, norms, standards and waste management service standards for regulating the management of waste by all spheres of government.

- **Municipal systems act (act 32 of 2000)**

The municipal systems act sets out functions that have to be exercised by the local authority, some of which are indicated below. These functions have a direct bearing on waste management. A few selected functions that relate to service delivery and waste collection have been listed below.

- Promoting a safe and healthy environment.
- Administering and regulating its internal affairs and the local government affairs of the local communities.
- Monitoring the impact of effectiveness of any services, policies, programmes or plans.
- Developing policy, plans, strategies and programmes, including setting targets for service delivery.
- Implementing applicable national and provincial legislation and its bylaws.
- Providing municipal services to the local community
- Promoting and undertaking development.

- **BA-PHALABORWA IWMP DRAFT**

- It is guided by DFFE integrated waste management guidelines
- Plans to develop and address recycling through its waste situation assessment. This assessment gives a detailed description of population and development profiles of Ba-Phalaborwa.

- Aims to integrate and optimize waste management planning to maximize efficiency and minimize the associated environmental impacts and financial cost.
- The municipality is providing waste management services to 22941 households. Currently they have 1 licensed landfill which is in operation and plans to develop and new one are underway. The percentage of waste recycling are currently low. Recycling in the municipality is currently done by private companies.

AVERAGE AMOUNT OF WASTE GENERATED MONTHLY IN BA-PHALABORWA MUNICIPAL AREAS IN 2023.

The following table shows the average percentage of waste generated in the Ba-Phalaborwa municipal areas from January to December of 2023.

WASTE CLASS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
general municipal waste	4.95%	5.88%	13.1%	8.4%	5.2%	10.9%	9.7%	9.1%	9.4%	9.7%	9.9%	3.9%
commercial and industrial waste	5.38%	4.59%	2.9%	6.8%	10%	7.9%	6%	8.8%	8.22%	7.01%	6.47	25,1%
organic waste: garden waste	7.95%	7.01%	12.9%	8.5%	9.1%	9.2%	11%	9.51%	8.2%	7.61%	8.37%	0.15%
construction and demolition waste	7.46%	15%	11.9%	6.3%	7.3%	7.8%	7%	7.3%	7.61%	10%	7.16%	5%

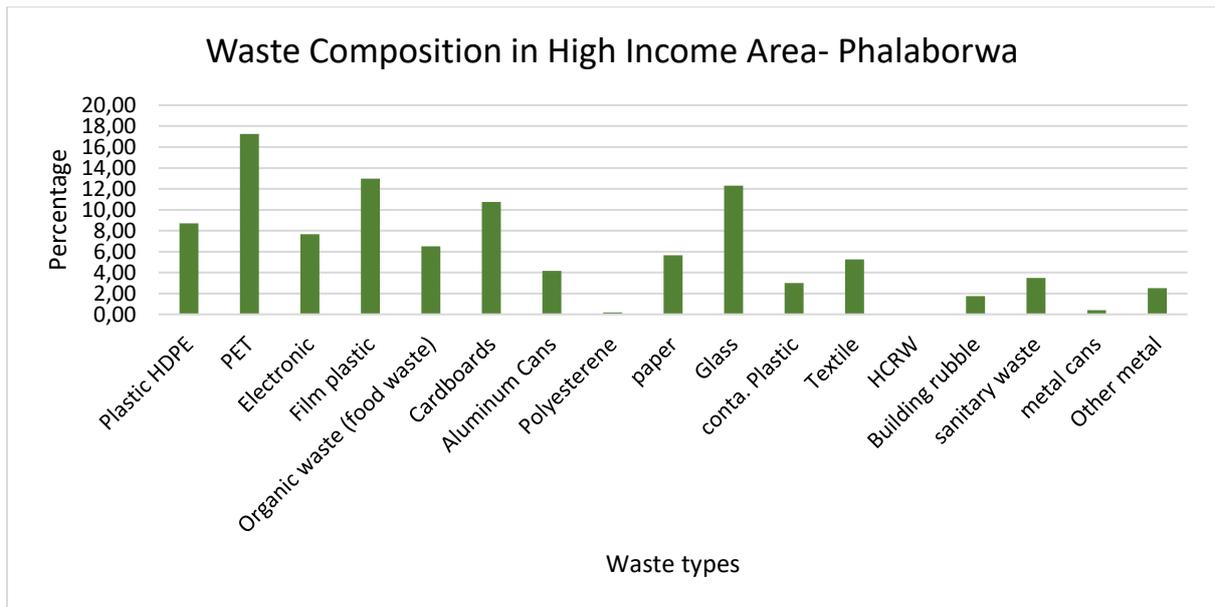


Figure 3: a graph illustrating waste composition in Phalaborwa
Source: Ba-Phalaborwa IWMP (DFFE)

IMPLEMENTATION PLAN FOR THE RECYCLING STRATEGY

Action and targets	Priority	Timeframe	Budget	Funding source	Responsibility
Category 1 Goals					
<ul style="list-style-type: none"> To support the use of environmentally friendly waste disposal technology Increase the diversion of recyclable materials from Landfill disposal to reduce environmental impacts and conserve resources. Improve recycling infrastructure including collection systems, processing facilities and public education resources to support efficient recycling operations. To improve productivity for Ba-Phalaborwa farms, gardens and landscapes while reducing greenhouse gas emissions and increasing local food security. 					
1.1. Ba-Phalaborwa Local Municipality is aware of waste generated in the municipal areas and it is now to adopt to new environmental friendly practices and to minimize the amount of waste going into in the landfill					
1.1.1	Recycling facility where sorting and recycling will take place.	Medium	2024-2025	Nil	External/ internal BPM & Stakeholders
1.1.2	Composting facility where garden waste is to recycled for the betterment of local	Medium	2024-2025	Nil	External/ internal BPM &

	landscaping and food security thus to address SDG No.2.					Stakeholders
1.1.3	Formalization of partnerships and collaborations with Private Sector institutions to enhance waste management activities	Medium	2024-2025	N/A	External	Stakeholders
Action and targets		Priority	Timeframe	Budget	Funding source	Responsibility
Category 2 Goals						
To encourage environmental education and awareness in communities, especially since they are the primary waste generators.						
2.1. Ba-Phalaborwa Local Municipality to improve waste awareness for the community.						
2.1.1	Make waste information accessible to the community (workshops, seminars, localized Initiative programmes, etc..)	High	Immediately	Nil	Internal/ External	BPM & stakeholders
2.1.2	Offer support to community based projects, recyclers and informal waste collectors	Medium	2024-2025	Nil	Internal/ external	BPM & stakeholders
Action and targets		Priority	Timeframe	Budget	Funding source	Responsibility
Category 3 Goals						
<ul style="list-style-type: none"> To be a department that is completely capable of providing its services efficiently and effectively. Foster a culture of environmental responsibility and sustainability within the municipality by promoting recycling and waste reduction practices. To create sustainable livelihoods through waste recycling (waste collection and minimization). 						
Ba-Phalaborwa local municipality is to adapt to effective waste management strategies that align with both provincial and national plans.						
3.1	To ensure holistic service delivery, by ensuring that material recovery is done in their jurisdiction.	High	Immediately	Nil	Internal/ external	BPM, MDM & Stakeholders
3.2	Development of core documents, policies and plans that are to guide the management of waste in Phalaborwa (IWMP Draft).	High	Immediately	Nil	Internal/ External	BPM, MDM & Other departments
Action and targets		Priority	Timeframe	Budget	Funding source	Responsibility
Category 4 Goals						
<ul style="list-style-type: none"> A healthy environment will provide increased socioeconomic advantages and job development for current and future generations through recycling and other environmentally conscious activities. 						

<ul style="list-style-type: none"> To create job opportunities for youth in the rural areas of the Ba-Phalaborwa municipality. 						
Ba-Phalaborwa municipality is dedicated to foster a clean environment for its residents and to improve public health and quality of life for current and future generation.						
4.1	Establishment of facilities to create jobs for residents. (Establishment of recycling and composting facilities).	Medium	2024-2025	Nil	Internal/ External	BPM MDM &

Phase1: Establishment of Drop-off centers.

Drop-off centers will be established at schools, government sites, Tribal offices, and other social and communal points to have a greater outreach in rural and township areas.

Informal recyclers and community members will be encouraged to recycle if there are drop off centers near their areas. Therefore, schools and taverns are suitable areas, as there are 57 schools in Ba-phalaborwa area that extend to all 19 wards. Furthermore, Ba-phalaborwa has several numbers of taverns where alcohol is sold, some of these can be used as drop-off centers in remote communities or villages.

Along with these institutions, other commercial businesses such as retailers, manufactures, industries and other organizations that produce higher volumes of waste/ recyclables can also be adopted in the recycling strategy. Drop-off points can be established on the premises of the businesses or at a central drop-off point can be established to collect recyclables from the CBD, Urban areas, and commercial centers namely, shopping malls, shopping complex and business district.

Furthermore, forums and schemes will be developed to facilitate engagement, partnerships and consultations between recycling companies and informal recyclers.

Phase 2: Launch an educational campaign about recycling initiative.

Launch and educational campaign informing citizens and stakeholders about the recycling initiative. Create educational materials such as pamphlets, posters, and social media postings to create awareness about the benefits of recycling, acceptable materials, and effective sorting processes. To reach the communities various population make educational materials available in multiple languages. Engage and educate the public through outreach initiatives such as workshops, presentations, and community events.

Work with local schools, community centers, faith-based organizations, and youth groups to include recycling education into current programs and activities (Adopt a school campaign). Collaboration with community organizations broadens outreach efforts and create opportunities to reach new audience. Use digital tools like social media, websites and Emails, Newspapers to share instructional content and interact with residents online. Use visual aids, demonstration to show proper recycling and sorting process during educational campaigns. Visual learning can be extremely successful in conveying difficult materials and enhancing user knowledge.

Phase 3: Collection and Transportation of Recyclables.

Once recyclables have been dropped off at the site, they will then be sorted/ categorize and banded into 1-ton sacks to ready them for transfer to buy back centers and recycling companies in Ba-Phalaborwa.

Recycling companies that are in partnership with the drop-off point will collect the bagged and categorize recyclables from the drop-off point situated around Ba-Phalaborwa. The collection will be done based on the preference of the recycling companies either on a weekly or monthly basis.

Implement incentive program or reward system to incentivize residents to participate in recycling efforts. Incentives can help motivate individuals to adopt recycling habits and sustain their participation over time. During the collection recyclers will be paid for their begged goods.

Phase 4: transfer of recyclables to processing facilities or by back centers.

Once sorted, recyclable materials are compacted and baled to reduce volume and facilitate transportation. Baling makes it more efficient to transport large quantities of recyclables to processing facilities or buy-back centers. To minimize volume and ease transportation, recyclable materials are compacted and baled after sorting. Transporting massive amounts of recyclables to processing plants or buy-back centers is more efficient when baling them.

To be delivered to processing plants or buy-back centers, baled recyclables are put onto trucks or other forms of transportation. Logistics concerns, volume, and distance all play a role in the type of transportation that is selected. Recyclables are processed further once they are transported to processing facilities so they can be repurposed or remanufactured.

Shredded, melted, crushed, and other mechanical procedures may be used to convert the materials into feedstock or raw materials for producing new goods.

Recyclable materials that have been processed are then sold to producers or other end users, who use them as raw materials to make new products. The market demand for recyclables is created by the sale of recycled materials, which also contributes to the sustainability of recycling initiatives financially. A closed-loop recycling system that reduces waste and preserves natural resources is produced when recycled materials are utilized to make new goods, which are subsequently sold and finally recycled once more.

RECYCLABLES CHARACTERIZATIONS IN BA-PHALABORWA

Re-usables that are the environmentally preferable are food ware and beverage. Each organization should start by carefully assessing the viability of reusable for their food ware and beverage needs.

The following reusable are recommended:

Bottles, bags, cups, cartulary, food containers, cardboard boxes, aluminum cans, garden waste, ferrous and nonferrous – throughout Phalaborwa

Water bottle refilling stations: refill stations to be established in all municipal areas, to make is easier for the community to refill their reusable water bottles.

No	Recyclable Material	Picture
i)	Aluminum Cans	
ii)	High Density Polyethylene (HDPE) (Milk containers, shampoo bottles, etc)	

iii)	Polyethylene Terephthalate (PET) (Clear, green and brown soft drink bottles, tomato sauce bottles, cooking oil containers, etc.)	
iv)	Clear Low Density Polyethylene (LDPE)	
v)	Mixed Low Density Polyethylene (LDPE)	
vi)	Polypropylene (PP) (Yoghurt containers, butter containers, plastic chairs, pot plants, Tupperware, children's toys, etc)	
vii)	White Paper (KL1)	
viii)	Cardboard (K4)	
ix)	Bio waste, organic waste and garden waste	

x	Ferrous and Nonferrous materials	
Xi)	Glass	
Xii)	E-waste	
Xiii)	Construction rubble	
Xvi)	Hazardous waste	

Waste characterization



Figure 4: waste characterization of Ba-Phalaborwa
SOURCE: Ba-PHALABORWA IWMP (DFFE)

ALIGNMENT WITH OTHER STRATEGIC PLANS AND RECYCLING STRATEGIES IN SOUTH AFRICA

IWMP draft (2023-2024) - the IWMP will assist the municipality in improving the current waste management practices which mainly focuses on waste collection and disposal to a more improved waste management practice that promotes green economy and sustainable development.

BA-PHALABORWA IDP DRAFT (2022) - the municipality is providing waste management services to 22941 households. Currently they have 1 licensed landfill which is in operation and plans to develop and new one are underway. The percentage of waste recycling are currently low. Recycling in the municipality is currently done by private companies.

Chris Hani district recycling strategy – The focus of this recycling strategy is on increasing recycling of post-consumer or domestic waste as it possess a greater challenge, and post-industrial waste being accumulated in large quantities may also pose an environmental risk.

Mopani District IDP- Partnership and collaboration with other Local municipalities that are currently engaged with recycling activities, may potentially be a learning opportunity for Ba-Phalaborwa. Currently Greater Letaba Municipality and Greater Tzaneen Municipality have taken great strides in waste management and recycling in the district.

ECONOMIC ANALYSIS

South Africa is committed to sustainable development which is aimed at balancing the broader economic and social challenges, this is evident through their commitment to achieving the SDG's, while protecting environmental resources. On a waste management stand point this means that care must be taken to ensure wise consumption, production patterns, resource efficiency, waste prevention & minimization, and waste reuse & recovery.

Recycling opportunity statement

- Opportunities for improving may not reside in the already well developed markets. E.g. Glass, paper, plastics and cans.
- The potential lies in unexploited markets for (tires, E-waste, organic waste, construction and demolition waste, etc...). Increasingly complex waste streams will therefore rely on more specialized technology to enable recycling.
- Recycling rates are influenced by the quality of recovered materials, and the economic viability of recycling operations.

THE ECONOMIC VALUE OF RECYCLING

The economic values of Phalaborwa municipality areas solid waste goes beyond the cost of dealing with the physical waste stream, to the value that is inherent to the actual waste which can be maximized or extracted through recovery, recycling, and reuse. Moving waste up the hierarchy towards reuse, recycling and recovery, contributes to the principles of a 'green economy' in a number of ways:

- Contribution to economic growth and job creation.
- Reducing social and environmental costs (externalities)
- Re-introduction of resources back into the economy.

SWOT ANALYSIS.

Strengths	<ul style="list-style-type: none"> • Ba-Phalaborwa has a variety of economic activities such as mining, tourism, agriculture and industries that can supplement recycling in the area. • Municipal planning is committed to “Sustainable Development and therefore several plans are underway to adopt sustainable practices in the municipal area. • Motivates Residents of Ba-Phalaborwa Municipality to participate effectively in sustainable management action and recycling •
Weaknesses	<ul style="list-style-type: none"> • Transportation costs of recyclables to recycling facilities are very high, as many recycling facilities are in metropolitan areas like Johannesburg and Durban. • Low volumes of recyclable materials are produced or processed in the area. • Infrastructure at recycling facilities is insufficient and outdated. • Requires very good public awareness and support from communities
Opportunities	<ul style="list-style-type: none"> • Partnership and collaboration between Municipality, industry and communities can strengthen recycling programs and address challenges more effectively. • Fundraising opportunities are more readily available as the area is an industrialized areas with large- and small-scale mines. • Reduction of waste volumes at Landfill site and surrounding areas • Job creation and Local economic development
Threats	<ul style="list-style-type: none"> • Landfill has reached its capacity, and this may alternately hinder recycling activities.

	<ul style="list-style-type: none">• Low awareness of recyclables and recycling amongst population• Social unrest from community members• High operational/transportation costs
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Feasibility Analysis

A recycling strategy's ability to be implemented in Ba-Phalaborwa would depend on a number of variables, such as funding, infrastructural accessibility, and community involvement. A feasibility study would be necessary to evaluate these elements and ascertain whether such a plan is feasible. It would entail assessing the market demand for recycled materials, possible recycling facilities, regulatory frameworks, present waste management procedures, and transportation logistics. Furthermore, public awareness efforts and stakeholder participation would be essential to the recycling initiative's success.

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