



SOUTHERN AFRICA
FOOD LAB



**Understanding Food Loss and Waste Streams in the
OR Tambo District Municipality**

**Towards the Development of Value Chain for a Circular Economy in the Food Waste
Sub-Sector for Sustainable Jobs and Inclusive Growth**

Executive Summary

A funnel approach was used to conduct the study on the food systems, waste, and losses. This entailed developing a matrix of the stages in the food value add system and food commodities and collecting information to understand the situation with food production, waste, and losses in OR Tambo District Municipality (ORTDM). Having collected this information, key stakeholders that could potentially provide insight into the food system, waste, and losses in ORTDM were contacted and interviewed where possible. Stakeholders included national food commodity associations, private sector organisations, local authorities and independent entities involved in the food value add chain. A total of 45 stakeholders were contacted and of these, 19 were interviewed. A list of the stakeholders is provided as Annexure 1.

Baseline information

Detailed geospatial information was sourced and collected for ORTDM. This included land cover data to show the different forms of agricultural production and grazing capacity for livestock in ORTDM. National associations were contacted to source information on agricultural production in the district municipality. Invaluable information was provided by the SA Crop Estimates Committee on commercial and subsistence agricultural production in ORTDM and surrounding district municipalities. Satellite imagery was also used to gain an understanding of the distribution of small scale agricultural production in the area. The extent of livestock production at a local municipality level was provided by the Umzikantu Red Meat Abattoir that was obtained from a census done by the provincial Department of Agriculture.

Google searches were done to obtain information on facilities involved in post-harvest handling and storage; processing and packaging; and distribution, warehousing, and retail. All these facilities were mapped to provide an understanding of their extent. Where possible, stakeholders associated with these facilities were identified and interviewed to access information on the extent of food input, waste, and loss.

Food production, storage, and processing

The situation in ORTDM is that there is hardly any commercial agricultural production. A review of the data provided by the Department of Agriculture, Land Reform and Rural Development shows that the district has high potential for the production of all forms of food crops as well as livestock.

The main forms of agricultural production are subsistence/small scale with the main focus being on maize production and livestock ownership. Hardly any of this agricultural production enters the formal food value chain in ORTDM or elsewhere. As a consequence,

there are few facilities in the district for post-harvest storage and handling. There is a silo & mill at Mqandulu that obtains 40% of its white maize from local farmers and the rest is imported from other provinces. This is largely a consequence of subsistence maize producers moving from white to yellow maize because of drought conditions in the area. Less than 1% waste (< 22.5 tons) is generated by the silo and mill that is sold as feed to farmers.

The Umzikantu Red Meat Abattoir is a high throughput abattoir that is at 25% capacity because of a lack of suitable livestock production in ORTDM. With over 2.3 million cattle, sheep and goats being enumerated in ORTDM, the abattoir only processes 3 575 animals per annum. Most of which do not enter the formal food value add chain locally or elsewhere. The abattoir produces 12 tons of by-product, mainly intestinal content and blood that is made available free as manure. Most study by-product is sold to formal and independent retailers.

The Chicken World Abattoir is at 60% capacity and obtains most of its chicken for processing from outside ORTDM. The 5 ton of chicken is processed on a weekly basis that produces 20% by-product and this is all sold to independent stores in the area. Only one cold storage food facility was identified in ORTDM that stores up to 140 tons of chicken per week, which distributed to wholesalers and retailers in the area. This facility produces about 0.5 tons of waste per annum. All of the chicken stored at Umtata Cold Storage comes from outside of the district. This gives some indication of the potential for chicken farming in ORTDM.

The Kei Fresh Produce Market processes just over 3.3 thousand tons of fresh produce per annum but is only at 25% capacity. The limited fruit and vegetable production in ORTDM results in them sourcing most of their produce from outside the district. In the past, the market was both equally formal retail and informal traders but presently it is 60% informal traders. There are no other known food markets in ORTDM but it is likely that informal markets and traders obtain produce from the subsistence and small scale producers in the different local municipalities. Kei Fresh Produce Market has an annual waste discard of 12 tons that is sent to the local refuse site. Other than what was described above, there is little other processing and packaging of food produce in the area, which is mainly a consequence of the limited agricultural production in ORTDM.

Wholesale and retail distribution

There are at least 14 wholesalers in the district that come from companies such as Browns, Rhino, Boxer and Spargs. Data on the extent of waste emanating from these facilities were obtained from Tata Waste, one of the only waste removal companies in the district. Their data suggests that wholesalers on average produce approximately 3.2 tons per annum of food waste out of a total of 161 tons of wet waste per warehouse facility per annum. The wholesale sector in ORTDM would produce approximately 44.8 tons of food waste per year.

There are at least 60 grocery retailers located in the towns within the different local municipalities with the highest concentration being in Mthatha. The Spar group has the largest number of stores at 23 followed by independent supermarkets with 16 and Shoprite with 11. Data collected by Tata Waste indicates that the 60 grocery stores could generate up to 380 tons of food waste each year. Food waste makes up approximately 8% of the total wet waste being collected from the grocery stores (4 370 tons per annum). It is important to emphasise that this calculation of the extent of food waste excludes amounts taken by pig farmers prior to collection by the waste collection company. The extent of the waste will vary depending on the size and type of the grocery store.

There are at least 7 shopping malls of different sizes and types in ORTDM. Consequently, the extent of food waste that will be generated will vary quite significantly. However, Tata Waste has collected information on four of the major malls situated in Mthatha. The total food waste collected from these malls in one month was 4.4 tons or 52.8 tons per annum. With an average of 13.8 tons of food waste for shopping malls per annum, the total food waste of shopping centres in ORTDM would be approximately 96.6 tons per year.

Thirteen hotels, 13 lodges and 7 resort hotels have been identified in ORTDM. These are situated across the different local municipalities and will vary in size. The highest concentration of hotels are found in the Mthatha area where there is 9 hotels. Tata waste collects refuse from two of these hotels in Mthatha with a total food waste of 116.5 tons per annum or average tons per hotel at 58.2 tons per annum. If one uses this as a proxy, then the 33 hotels, lodges and resorts would generate 1 920.6 tons each year.

Data was collected on sit down and takeaway restaurants with a total of 18 being identified in ORTDM. Tata Waste collects wet and food waste from 4 restaurants in the Mthatha area. The total wet waste collected in one month is 13.9 tons, which equates to 166.8 tons per annum or 41.7 tons per restaurant in each year. The size of the restaurants as well as the months would have a significant influence on the amount of food waste generated, with the December period being where 80% of the business is done.

In the ORTDM there are 28 hospitals distributed across the different local municipalities with 9 being in Mthatha. From one of the hospitals in Mthatha, Tata Waste collects wet and food waste to the extent of 8.8 tons per month or 105.6 tons per annum. All the hospitals in ORTDM may potentially produce over 2 900 tons of food waste each year.

There are 637 primary schools located in ORTDM which are assumed to all have a school feeding scheme. Vermigrand is involved in the recycling of food waste using vermi-compost and Bokashi bins that are dropped off and collected from private households as well as primary schools. Normally, four Bokashi bins are collected per week from a primary school with food waste. This equates to 100 litres or 720 kgs or 0.8 tons per week. If one considers

that there are 637 primary schools then the food waste using these proxy values would be 509.6 tons per week, 2 038.4 tons per month or 24,460.8 tons per annum. This is a significant amount of food waste that should be processed to form compost. It is important to emphasise that a lot of the food waste from primary schools is collected and used by pig farmers.

Business and residential household consumption

According to Statistics South Africa's Survey of Employees and Self-employed there is more than 43 000 businesses of different sizes in the ORTD. More than 57% of these businesses are commercial and independent wholesalers and retailers. Another 14% are in the transport, storage and communication industries. Using a very conservative figure of 9.2 kgs of food waste per month for individual businesses, a rough estimate of the annual amount for the 43,000 businesses would be approximately 436 tons. The amount of waste would vary depending on the industry within which the business is situated.

According to 2020 estimates, ORTDM has a population of over 1.5 million people and more than 732,000 households. Although the average household size will vary between urban and rural areas, conservative number of 2.2 people per household can be used. Data provided by Vermigrand estimates that for a household of 2-3 people in an urban area like Mthatha, they generate around 188 kgs or 0.21 tons of food waste per year. Consequently, all the households in ORTDM would generate more than 153 000 tons of food waste in a year.

What is critically important is that the information on tons of food waste presented above are validated against other sources of data at different stages of the food value chain. A key aspect of doing a study of this nature is that sufficient baseline geospatial information is collected so that a picture of the extent of waste at different stages of the food system can be approximated. Although the estimates of food waste provide some indication of the extent of the situation in ORTDM, the extent of facilities generating the waste and the extent of the waste have not been validated. What is also missing is an understanding of the extent of food waste considering the different commodities.

Lessons learnt

Lessons learned from the study indicate that the extent of waste in the early stages of the food system, that is, during food production, storage and handling as well as processing and package, are fairly minimal. A key reason for this is the limited extent of commercial as well as small scale food production in ORTDM. Consequently, there is little need for extensive facilities to store, process and package food commodities. It is at the distribution, retail and consumption stages of both businesses and individual households where the extent of waste is significantly higher. The extent of this food waste will be summarised in the main report.



The potential of the ORTDM for the production of agricultural commodities indicates that significantly more food should be produced in this area. There should also be a concomitant increase in the extent of storage, processing and packaging facilities. For this to occur, requires extensive networks to be established throughout ORTDM to create more viable small scale and commercial farming areas, as is the case in the surrounding districts. There is no doubt that significant government funding and private sector investment in the form of Public Private Partnerships is required in the agricultural production and processing sector.



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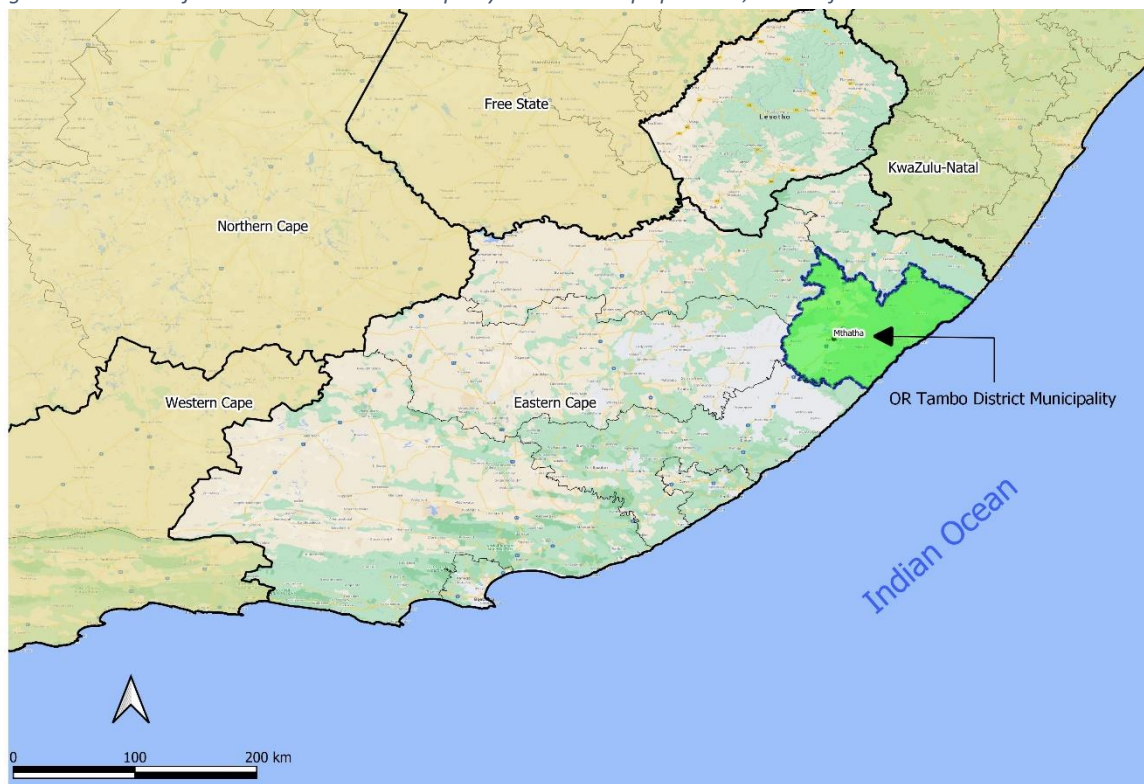
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1. About OR Tambo Municipality

The OR Tambo District Municipality is located on the east coast of the Eastern Cape Province and covers an area of approximately 15 947km² (Figure 1). The settlement characteristics of OR Tambo have 54% of households located in rural traditional areas. The remaining settlement patterns consist of small towns and villages with Mthatha being the largest urban centre. Around 6.3% of dwellings in the urban centres and towns of OR Tambo District Municipality are RDP/government subsidised. Of these dwellings, 65.3% are rated as being in good to average condition while 34.7% were rated as being in poor condition (Stats SA). There are a total of 148 wards found within the municipality.

Figure 1: Location of OR Tambo District Municipality in Eastern Cape province, South Africa

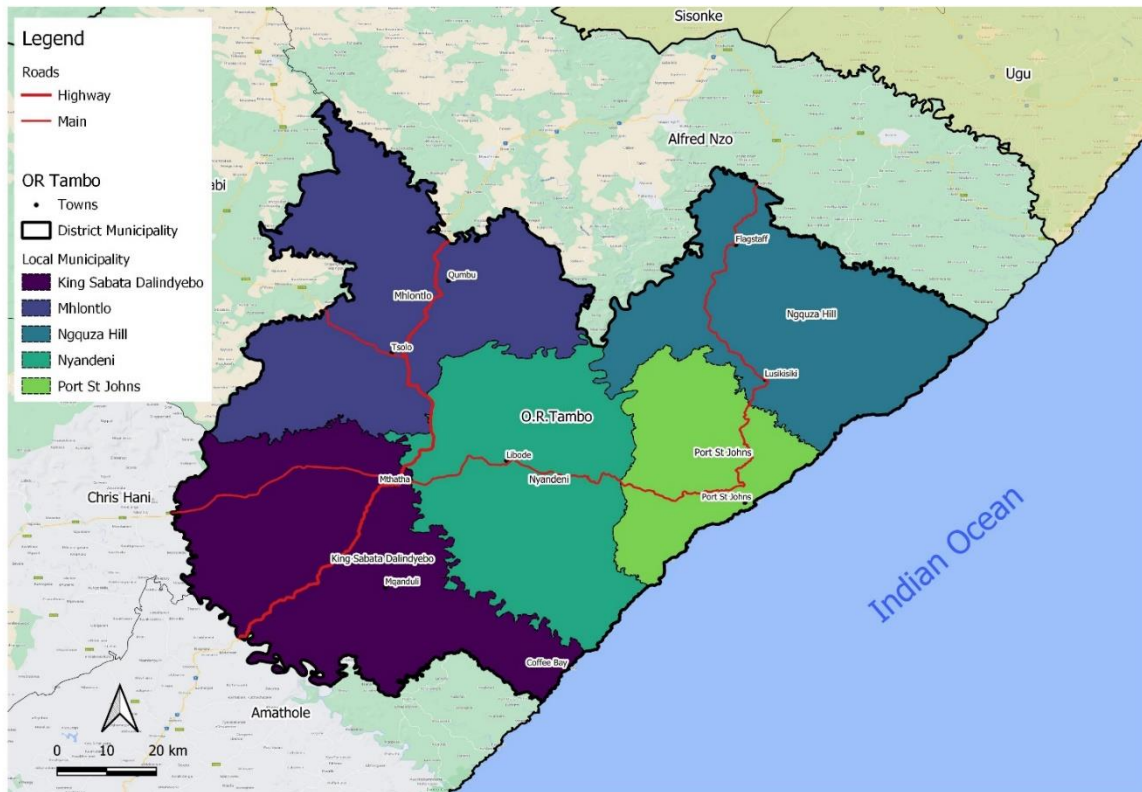


The OR Tambo District Municipality has a wide range of land uses including formal and informal urban areas and rural settlements and these have access to economic, transport, public and social infrastructure. Other prevalent land uses include subsistence maize agriculture and large grassland that are used by communities for cattle grazing.

About 90% of the land area of the OR Tambo District Municipality is rural traditional lands, with urban centres and towns making up approximately 9% and the remaining 1% being used for agriculture (tea plantations & afforestation). Most of the urban centres and towns are situated near a major road, either the N2 or the R61. With such a small portion of land

being used for commercial farming, the area is missing out on agriculture opportunities, which could help to boost the economy of the area.

Figure 2: Local municipalities in OR Tambo District Municipality



The municipality is formed by five local municipalities: King Sabata Dalindyebo, Nyandeni, Mhlontlo, Port St Johns and Ingquza Hill. It covers about 80% of what used to be homeland in the Transkei and is one of the four Integrated Sustainable Rural Development Programme (ISRDP) nodes in the province. It is bordered by the Alfred Nzo District Municipality to the north, the Joe Gqabi District Municipality to the north-west, the Amathole District Municipality to the south-west, and the Chris Hani District Municipality to the west. Figure 2 shows the local municipalities in OR Tambo District Municipality (ORTDM), major roads, as well as the main towns in the region.

According to Stats SA, the total population in OR Tambo in 2019 was 1.5 mil people. The gender profile of the OR Tambo Municipality is typical of most other municipal areas in the country. There are a greater number of females totalling to around 802 582 (53%) as opposed to males which are 711 723 (47%).

According to Stats SA the OR Tambo district municipality has a young population with 52% of the population being between the ages of 0-19 years. Individuals within the 20–49 year age group comprise 36% of the population followed by the older working age of 50-59 years comprising only 5% of the population. The high number of children in the district leads to a high dependency ratio. In 2019 the dependency ratio for the district was 81%. The OR

Tambo district municipality has the second highest dependency ratio in the Eastern Cape, after the Alfred Nzo District.

In 2019 there were a total of 314 079 households in the OR Tambo District Municipality (Stats SA). The average household size stayed the same at 4.3 from 2011 to 2019. In the OR Tambo District, 14 313 households are child-headed within the 15-19 age group, with 837 households headed by children in the 10-14 age group and 57.2% of households were headed by women (Stats SA).

In the OR Tambo District Municipality, 1.3% of the households are informal dwellings which is lower than the provincial average of 7.3% (Table 1). While 33% are formal dwellings which is significantly lower than the provincial average of 56%. A further 54% of the dwellings are traditional dwellings.

Table 1: Number of household types in local municipalities of OR Tambo District Municipality.

	Very Formal	Formal	Informal	Traditional	Other dwelling type	Total
Ingquza Hill	628	26,300	11,400	26,700	394	65,400
Port St Johns	456	10,300	6,690	18,600	43	36,000
Nyandeni	380	24,800	12,800	33,200	386	71,600
Mhlontlo	634	16,800	7,670	22,200	143	47,400
King Sabata Dalindyebo	16,200	55,800	19,500	34,000	861	126,000
TOTAL OR TAMBO	18,286	133,914	58,000	134,717	1,828	346,745

Source Stats SA

In 2018, the unemployment rate in OR Tambo (based on the official definition of unemployment) was 37.7%. The unemployment rate in the district was higher than that of Eastern Cape. There were 221 000 people employed in the district which is 15.4% of the total employment in Eastern Cape and 1.4% of total employment in South Africa. Employment increased annually at an average rate of 0.45% from 2008 to 2018.

In the OR Tambo District, an estimated population of 400 941 earn an income ranging from R1-400 per month which is the highest amount followed by income levels of R801-R1 600 per month. An estimated 599 829 of the population receive no form of income at all. The annual household income was R14 600 (Census, 2011).

The three main Gross Domestic Product (GDP) economic sectors in OR Tambo District Municipality are:

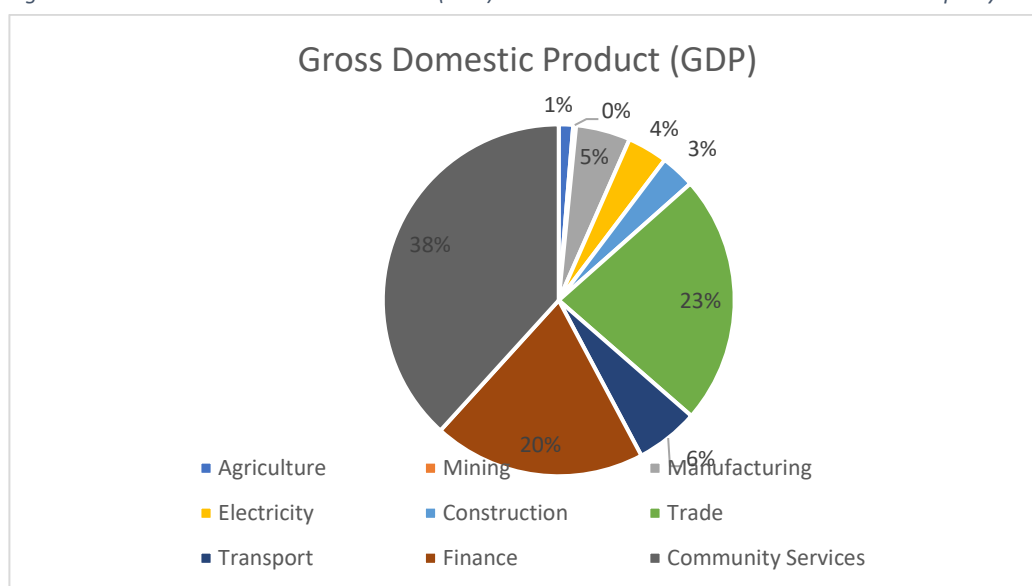
- Community Services - 38%
- Trade - 23%

- Finance - 20%

Community services refer to jobs including housekeeping, tours, municipal officials, nursing, and teaching. Trade is the exchange of goods and services, most often in return for money and includes the retail trade. Finance refers to the financial system including banking and insurance industries.

Figure 3 depicts the percentage contribution to GDP by broad sectors during 2018 in the OR Tambo District Municipality. GDP was recorded as R41.4 billion in 2018. The local economy was dominated by tertiary industries and reflects the weak resource based economic activities, including agriculture (1%), construction (3%), electricity (4%), manufacture (5%) and transportation (6%). Indicating the poor ability of production, transport, and processing of food. Food is predominantly imported from outside the district municipality where it is warehoused and distributed to retail services for consumption by local communities.

Figure 3: Dominant Gross Domestic Product (GDP) economic sectors in OR Tambo District Municipality



According to Stats SA, OR Tambo is one of the 10 districts with the lowest infrastructure quality index with high backlogs with regards to basic services. There is a need in the region to accelerate basic service provision to households to reduce backlogs and ensure that the population of OR Tambo District has access to all basic services.

The overwhelming majority of the population at 66.5% (using the lower poverty line) is living in poverty with only 15% being employment. OR Tambo District Municipality is classified as a Category C2 municipality, indicating a largely rural character and low urbanisation rate, as well as limited municipal staff and budget capacity.

According to the 2016 Community Survey, 18 % of households in OR Tambo skipped a meal in the last 12 months and 27 % of households ran out of money to buy food. As a consequence of the poverty levels, there is a cumulative total of 683 584 grant dependents in the district. The number of beneficiaries per grant type is indicated in the Table 2 below. With over 510 000 child support grant beneficiaries it reflects the high level of dependency on the state and the weak economic activity.

Table 2: Number of beneficiaries by grant type in OR Tambo District Municipality

GRANT TYPE	TOTAL BENEFICIARIES
Care Dependency Grant	5,206
Child Support Grant	510,208
Combination (Care Dependency and Child Support)	1,099
Disability Grant	33,619
Foster Care Grant	19,585
Grant-In-Aid	5,532
Old Age Grant	108,335
TOTAL	683,584

Source: SASSA (as of 30 April 2020)

Compared to its metro counterparts, a large proportion of OR Tambo's population is unskilled or low skilled. This level of unskilled people in the population is due to high levels of illiteracy within the district, and very low compensation packages to attract skilled personnel from other areas. In order to realise the agriculture potential in the region, there is a need to build more agricultural colleges to enable communities to acquire skills in subsistence and small-scale maize, vegetable, fruit, and tea production; and small scale livestock rearing (cattle, sheep and goats); forestry and aquaculture. Growing the agriculture industry can also provide work opportunities for unskilled people in the OR Tambo District.

The smaller buying power in the OR Tambo District as a result of lower incomes and higher unemployment means that there is less disposable income to support growth of the area's economy. It is recommended that the OR Tambo District aggressively pursue industries that support local production and manufacturing for local consumption and export to stimulate economic growth. This includes agriculture and tourism, among other activities.

The district is endowed with several tourism destinations such as Port St Johns, Lusikisiki, Coffee Bay, Qunu, Mthatha and Mhlontlo. The district encapsulates a large portion of the Wild Coast belt and is home to some pristine nature reserves. However, the tourism sector of this district is not as large as it should be, it is important to grow this sector as tourism brings in external revenue.

Possibly the biggest competitive advantage in ORTDM is its regional location and climate. The high levels of rainfall in OR Tambo allow rain-fed crop production. This is a major advantage for the district, as it means that most of the areas does not require costly irrigation schemes. The temperature profile gives rise to frost-free conditions in the winter, which allow a broader range of plants to be farmed. The climatic condition of the district gives the region a distinct advantage in the areas of agriculture and forestry development.

The OR Tambo district has a distinct advantage of being a region with substantial water resources. The district lies within the Umzimvubu, Keiskamma Water Management Area and the Mvoti-Umzimvubu Water Management Area. These are catchment areas with high water runoff, which means that there is opportunity to development these water resources.

The table below reflects the dominance of food commodity waste at different stages of the food value chain in ORDTM. Main forms of production are cereals and livestock with much smaller amounts of fresh produce being grown. Levels of waste remains low during post-harvest handling and storage as well as processing and packaging. The lack of production of oilseeds and pulses, fish and seafood and milk products results in food waste being very low during these stages. It is during the wholesale, distribution and retail stage (including markets) where food waste begins to increase. A significant portion of the food commodities are imported from areas outside of ORTDM. Highest levels of food waste occurs during the consumption stage especially for fruit and vegetables and meat intake.

	FOOD VALUE CHAIN STAGES				
	Production	Post-Harvest Handling and Storage	Processing and Packaging	Wholesale, Distribution, Retail & Markets	Consumption
Cereals (Maize & Sorghum)	Medium	Medium	Medium	Medium	High
Roots and Tubers (Potatoes)	Medium	Low	Medium	Medium	High
Oilseed and Pulses	Very Low	Very Low	Very Low	Medium	Medium
Fruit and Vegetables	Medium	Medium	Medium	High	Very High
Meat (red & poultry)	Low	Medium	Medium	High	Very High
Fish and Seafood	Very Low	Very Low	Very Low	Low	Low
Milk	Very Low	Very Low	Very Low	Medium	High

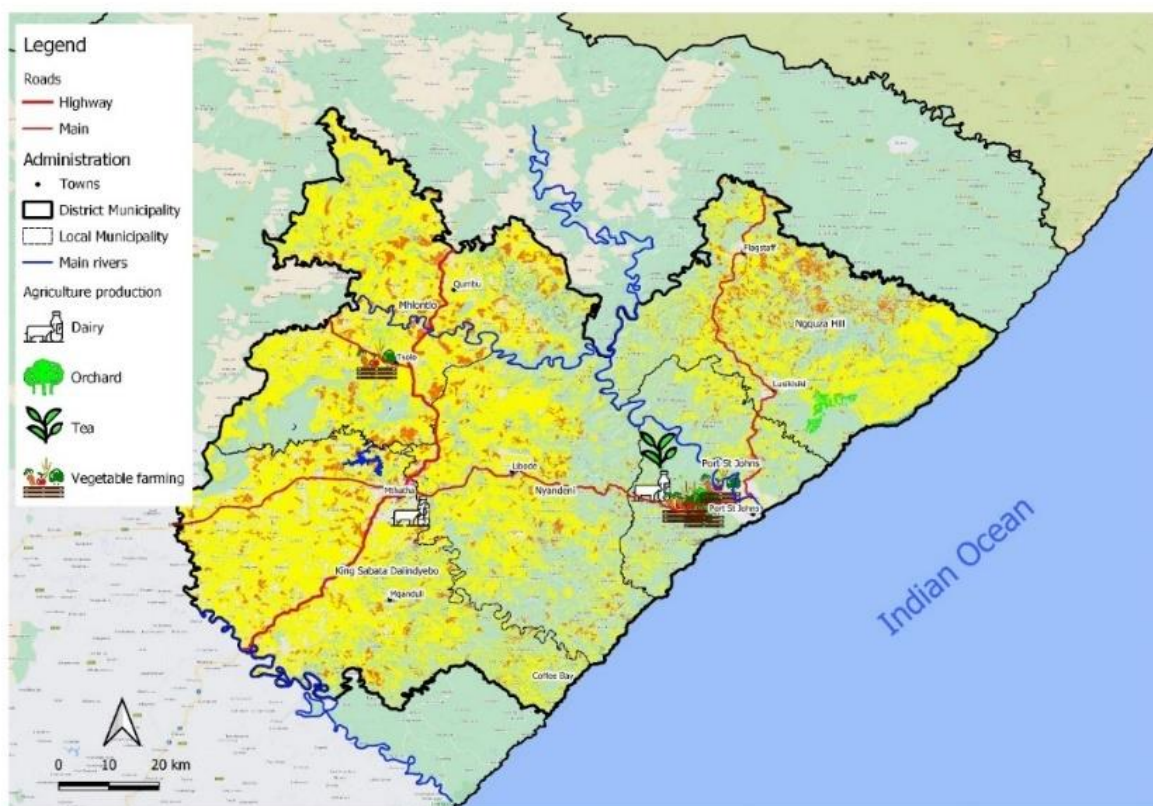
Very Low
 Low
 Medium
 High
 Very High

2. The Food Vale Chain in OR tambo

2.1. Food production

Agriculture within the OR Tambo District Municipality is predominantly for subsistence and emerging market sectors. It is also seen as a priority area that could contribute to the economy and job creation within the district. The food commodities that contribute towards agricultural production include subsistence maize, red meat, vegetable, fruit and tea production. The only commercial agriculture in OR Tambo is the tea plantations in the south of Ngquza Hill DM and near Port St Johns (6 700 hectares). There is also over 47,000 hectares of afforestation in the northern parts of OR Tambo DM. There were commercial dairy farms in Mthatha and to north of Port St Johns but these have closed down. There are small vegetable and fruit farms on the banks of the Mngazi River in Port St Johns DM and close to smaller towns, such as Tsolo.

OR Tambo has an area of 3.25 mil hectares. Figure 4 shows that a large part of the district is made up of grassland which covers 256 000 hectares (7.9% of land area) and is largely used for grazing by community cattle. Interspersed is just under 87 000 hectares (2.7% of land area) of subsistence agriculture, mainly yellow and white maize.



According to the SA Crop Estimates Committee there is no commercial crop production in OR Tambo District Municipality. In contrast, all of the district municipalities surrounding OR

Tambo district Municipality do you have commercial crop production. Table 3 shows that Chris Hani to the West has close to 24 000 Ha planted, Joe Gqabi to the north has close to 16 000 hectares, Amathole to the West has just over 8 000 Ha and Alfred Nzo to the east has close to 8 000 hectares.

Table 3: Agricultural production in district municipalities surrounding OR Tambo

District Municipality	Planted area (Ha)	Cereals Production (Ha)	Cereals Production (Tons)	%	Tons Cereal Production per Ha
Amathole	8 166	1 079	4 855	13.2%	4.5
Alfred Nzo	7 992	5 299	40 802	66.3%	7.7
Chris Hani	39 056	23 928	126 818	61.3%	5.3
Joe Gqabi	23 895	15 914	79 570	66.6%	5.0
Average				51.8%	5.6

2.1.1. Cereals

Generally, about two thirds of the commercially planted land is used for cereal production in this region of the country. According to the Department of Agriculture, Land Reform and Rural Development the local municipalities in OR Tambo DM are suitable for the production of maize, sorghum and wheat (King Sabata Dalindyebo & Mhlontlo LM).

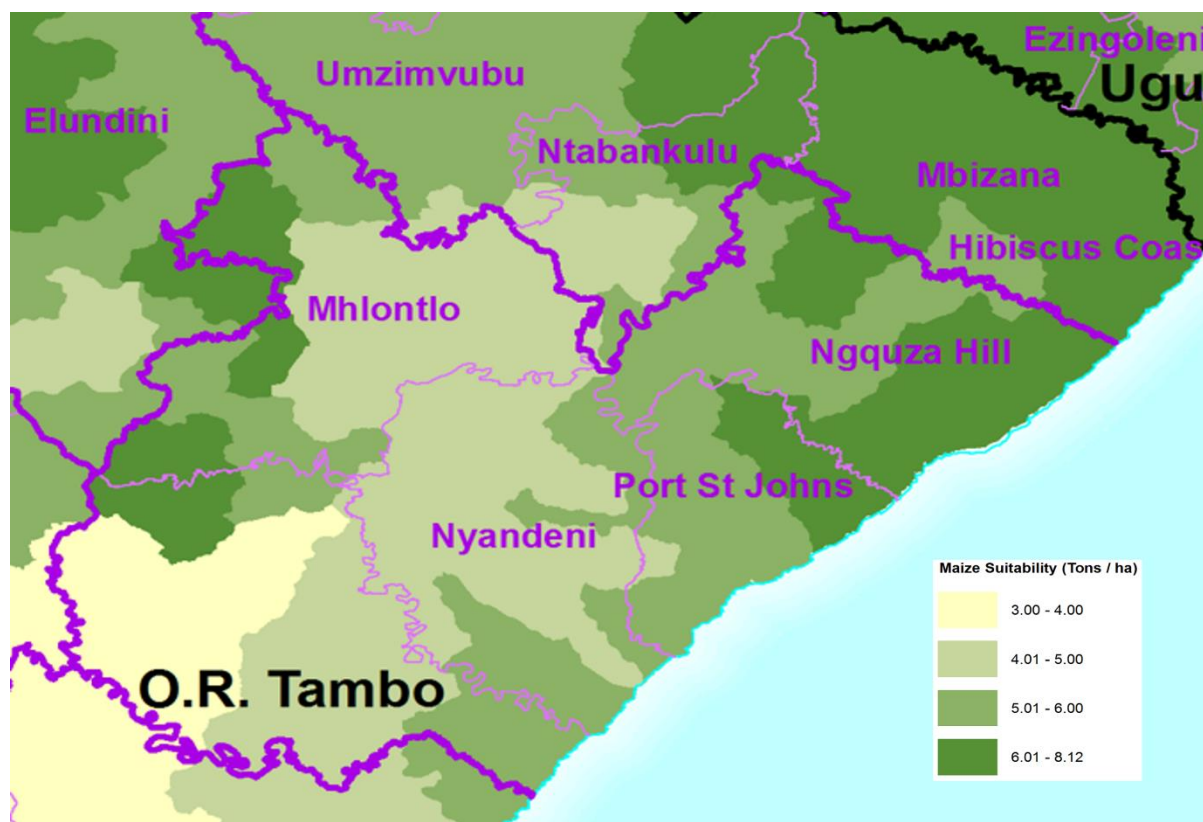
If one looks at the tons of cereal production per hectare on commercial farms, Amathole produces the lowest tons of cereal per hectare of 4.5 tons because of the rugged terrain (Table 3). OR Tambo District Municipality similarly has rugged terrain and would probably produce a similar amount of cereal per hectare for commercial production.

When it comes to subsistence maize production the tons per hectare in the Eastern Cape is 2.35 tons per hectare according to the SA Crop Estimates Committee. With 87 000 hectares under subsistence agriculture, the district has the potential to produce 136 000 tons of maize from subsistence farming and up to 174 000 tons of maize if farmed commercially (3 tons/Ha & 2/3 land used for cereals).

Mqanduli Red Hubb Silo & Mill processes 2 250 tons of white maize per annum with 40% of this amount or 900 tons coming from local farmers in OR Tambo and surrounding districts. Consequently, there is significant potential for maize production, but it would require effective farming practices and transport systems to move the maize to silos for milling. Figure 4 shows the maize suitability in the OR Tambo DM and confirmed that it is one of the

more productive areas for maize production in the country with the ability to produce 4-6 tons per hectare across large parts of the district.

Figure 4: Maize suitability OR Tambo District



2.1.2. Roots and tubers

The OR Tambo area like Alfred Nzo district to the west, has high potential for the production of potatoes. Although there may be some subsistence or small scale production of potatoes, there is no commercial production. Statistics from the Kei Fresh Produce Market show they process on average 2.5 mil tons of potatoes a year and that most of their potatoes come from outside the district, largely imported from other provinces like the Free State.

2.1.3. Oilseeds and pulses

According to DALRRD all of the local municipalities in OR Tambo District are suitable for the production of soya beans and other pulses. A study conducted by the University of Pretoria shows that there are over 118,000 hectares suitable for the production of soya beans with Mhlontlo LM (54 496 Ha) and Ngquza Hill (38 084 Ha) having the largest areas suitable for soya beans. It is unknown as to the extent of production of soya beans in the OR Tambo district municipality. However, it is highly likely that there is subsistence production of soya beans and groundnuts.

2.1.4. Fruit & vegetables

Fruit: The DALRRD has identified OR Tambo district as having a high potential for deciduous (apples & peaches) and citrus fruits (oranges, grapefruit, lemons, naartjes). Along the coastline of OR Tambo there is also potential for the growing of avocados, bananas, pineapples, and mangoes. Most fruit is imported from outside OR Tambo District municipality such as citrus from Sundays River in the Eastern Cape, apples from the Western Cape, bananas from Port Shepstone in KwaZulu-Natal as well as Mozambique.

Vegetables: OR Tambo is suitable for the production of the following vegetables: cabbages, potatoes, butternut, green pepper and spinach. Other than subsistence vegetable production there are a few small scale vegetable producers found on the banks of the Mngazi River near Port St Johns and on the outskirts of Tsolo. The Kei Fresh Produce Market (KFPM) obtains much of its cabbages, pumpkins, and carrots from these small scale farmers. The KFPM has input of more than 206 000 tons cabbages per annum, more than 10 000 tons of pumpkins per annum and more than 34 000 tons of carrots per annum.

2.1.5. Meat

The map in Figure 5 shows the grazing capacity or number of hectares required to support one Large Stock Unit (LSU) such as cattle in OR Tambo district municipality. From this information it was calculated that OR Tambo District Municipality could support over 449 000 cattle or LSU.

Figure 5: Grazing capacity

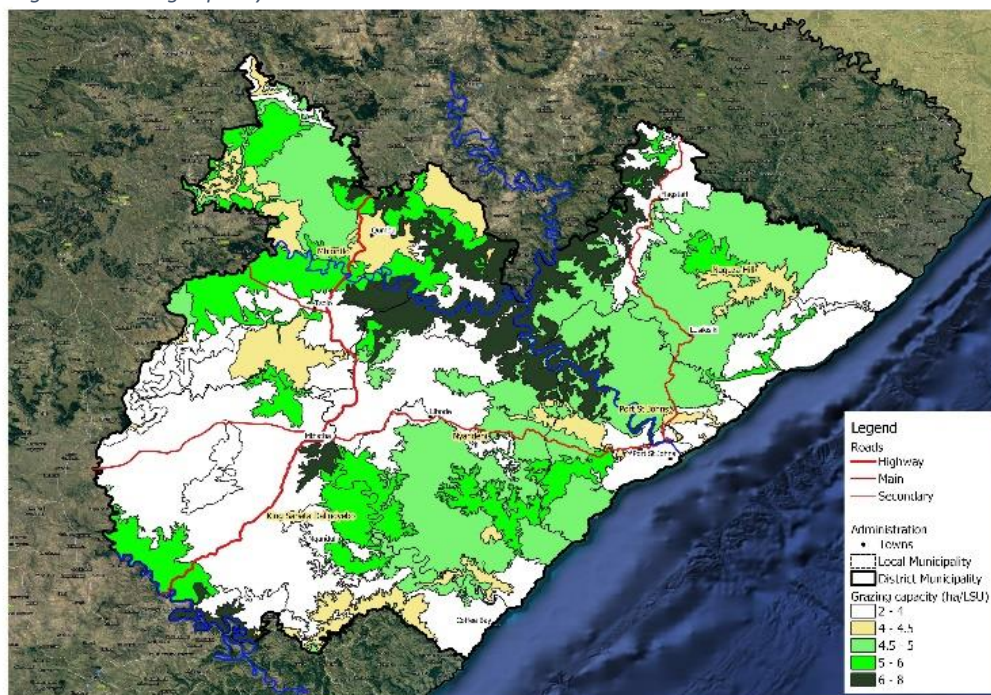


Table 4 shows census data provided by the provincial Department of Agriculture of the number of cattle, sheep, goats and pigs in each of the local municipalities of ORTDM. A simple comparison of the total cattle that could be supported considering the grazing capacity, with the actual number of cattle from the census, shows that the area could support more cattle. However, when one converting the number of sheep and goats enumerated in the census to Large Animal Units, it indicates that the area presently has over 660 000, which is higher than the grazing capacity of 449 000 by over 211 000 LSU. This could be the reason why some areas of the district have degraded grasslands, especially in the areas where there is a higher grazing capacity.

Table 4: Census of livestock in local municipalities in OR Tambo DM

MUNICIPALITY	CATTLE	SHEEP	GOATS	PIGS	TOTALS
King Sabata Dalindyebo	98 321	699 981	161 728	11 437	971 467
Nyandeni	74 504	374 522	41 136	6 133	496 295
Port St Johns	38 046	18 150	29 875	688	86 759
Ngquza Hill	64 482	72 773	73 285	6 062	216 602
Mhlontlo	52 197	395 785	130 904	4 680	583 566
TOTAL	327 550	1 561 211	436 928	29 000	2 354 689

The condition of livestock results in the quality of the meat being of a lower grade. It also results in most of the meat production entering the informal trade rather than being sold to major retailers. Most of the livestock being slaughtered in the Umzikantu Red Meat Abattoir is of a Grade B & C quality and comes from ORTDM and surrounding districts while the Grade A beef comes from outside the district. There is an initiative to improve the condition of livestock in ORTDM such as the Heifer replacement programme.

2.1.6. Poultry

Several poultry and egg production facilities existed in the ORTDM but during the COVID-19 pandemic they have largely closed their doors. A few small informal poultry production units remain, such as the Libazi Poultry at Tsolo. The farm produces 1 500 broiler birds per six week period. This equates to 2 700kg per six week period and 25.9 tons per year. This farm also used to produce eggs, but COVID-19 resulted in a focus only on poultry production.

There are no commercial poultry farms in ORTDM only smaller units producing 100 - 200 birds. The market for these chickens is the informal sector across the district and surrounding districts. Most of the poultry production happens outside of ORTDM in the Kokstad area and in the Western Cape. There is the Chicken World Abattoir that processes 300 - 350 birds per day with most of the production occurring outside of ORTDM. The

stakeholders in poultry production that were interviewed all indicated that there is a lack of investment in this sector in the district. A commercial chicken production and storage company trucks bringing in 140 tons of frozen chicken into ORTDM each week. There is clearly significant opportunity for a significant increase in chicken production in the area, but this requires significant investment to establish and develop commercial poultry producers through Public Private Partnerships (PPP).

2.1.7. Fish and seafood

There is no known commercial fishing or seafood harvesting, although Port St Johns has been identified by the Department of Agriculture, Land Reform and Rural Development as having a high potential. The coastline of OR Tambo District Municipality remains a valuable resource for recreational fishing and the harvesting of seafood.

A freshwater fish hatchery was operated at the Umtata dam until approximately 1987. The purpose of the hatchery was to breed fish for the stocking of dams in the area.

2.1.8. Milk

There were several dairies in the district, but these have all closed down. The Mantusini Dairy Farm near Port St Johns was the last operational dairy, but it went into disrepair and was forced to close down. After a R45 mil investment in the dairy it failed to remain sustainable and media reports point to a total lack of management by provincial and local government with their partners in the private sector and local communities.

2.2. Post-harvest handling and storage

2.2.1. Cereals

The only storage and processing facility in ORTDM is the Mqanduli Rural Economic Development (RED) Hub Silo & Mill. The silo has a capacity to store 2 250 tons of maize over 12 - 14 month. This is the period that the mill is able to process the maize. After storing the maize in the silos, they then process the maize in the mill and package it. Levels of waste are low with 23 tons annually being generated annually that is used as animal feed.

They get 40% of their white maize from local farmers in OR Tambo and surrounding districts, which they go and pick up from farmers. They get 60% of their white maize from commercial farming in the more maize orientated provinces like the Free State. The marginal climate in the ORTDM means that limited white maize of sufficient quality can be grown for the mill. Originally there was a lot of white maize produced in ORTDM but because of recent droughts most of the farmers have shifted to yellow maize which is more sustainable.

The facility is planning to prepare one silo for yellow maize only and to develop processes in the mill to enable them to process it into quality flour. Most of their maize is sold to retailers like Spar and to the SANDF as well as buying agents of government where it is used in things like the soup kitchens. They also package flour with branding for specific businesses. Some of their brands are Super White & Lumvuvo.

2.2.2. Roots and tubers; oilseeds and pulses; and fruit & vegetables

Other than the Kei Fresh Produce Market (KFPM), there are no known storage and processing facilities for roots and tubers (eg potatoes); oilseeds and pulses (eg soya beans); and fruits and vegetables (eg tomatoes, cabbages, pumpkin & carrots). The KFPM has a cold storage facility for fresh produce coming from ORTDM and outside of the district, which are stored in these facilities before they are sold in the market. The extent of waste generated by KFPM will be dealt with in Section 4.4.

2.2.3. Meat

There are no known storage facilities of livestock, such as feedlots in the ORTDM. It is understood that the transporting of livestock is the responsibility of the farmers. Umzikantu Red Meat Abattoir in Mthatha slaughters the livestock for farmers, which has its own storage facilities.

2.2.4. Poultry

In the poultry industry in ORTDM the transporting of chickens is done by the farmers and there are no storage facilities per se. There is the Umtata Cold Storage facility that is a division of Sovereign Foods that stores up to 140 tons of frozen chicken on a weekly basis, which is all sourced from outside ORTDM. The levels of waste are about 0.4% or 24 tons per annum.

2.2.5. Fish and seafood and Milk

There is no known commercial fish and seafood or milk production industries in ORTDM.

2.3. Processing, manufacture, and packaging

2.3.1. Cereals

The Mqanduli Rural Economic Development (RED) Hub Silo & Mill has a capacity to store 2 250 tons of maize over 12 - 14 month. This is the period that the mill is able to process the maize. After storing the maize in the silos, they then process the maize in the mill and package it. In terms of waste, they indicated that 0 - 1% is lost in the cleaning process. So, of 1 000 tons they would probably lose 10 tons. In the processing of the maize, they probably

lose 0.5% or 23 tons per annum in the processing. This is because of the highly efficient milling equipment that they have.

All of this waste is processed into animal feed, which is sold to farmers, and they also have contracts with businesses. Approximately 35% or 787.5 tons of the 2 250 tons is processed into animal feed. There is very little waste coming out of the food system of maize in the production, transport, storage, and processing stages. Whatever waste is generated it is largely recycled.

Most of their maize is sold to retailers like Spar and the SANDF as well as buying agents of government where it is used in things like soup kitchens. They also package flour with branding for specific businesses. Some of the maize brands produced at Mqanduli are Super White & Lumvuvo. In terms of waste, they indicate that 0 - 1% is lost in the cleaning process. So, of 1 000 tons they would probably lose 10 tons. In the processing of the maize, they probably lose only 0.5% in the processing. This is because of the highly efficient milling equipment that they have.

2.3.2. Roots and tubers; oilseeds and pulses; and fruit & vegetables

The processing and packaging of fresh produce is done by the farmers. For commercial farmers the transporting of fresh produce is normally done by commercial transporting companies while small scale farmers use their own transport.

2.3.3. Meat

The Umzikantu Red Meat Abattoir (URMA) is situated on the outskirts of Mthatha with residential areas encroaching on its borders, resulting it no further large expansion being possible. There were other red meat abattoirs in the district, but these are not functional. Most of the livestock processed by the abattoir comes from local farmers in ORTDM and surrounding districts. The Grade A beef processed at URMA comes from the Ntinga farms in the Greater Kokstad Local Municipality. The abattoir processes pigs, cattle, and sheep but are not licenced to slaughter goats. The table below shows the number of livestock or large animal units being processed by the abattoir on an annual basis.

Period: July 2020-June 2021			
Livestock	Number	AU/ratio	AU
Pigs	2 367	0.250	592
Cattle	796	1.000	796
Sheep	412	0.167	69
Annual throughput	3 575		1 456

URMA is licenced as a high throughput abattoir but only operates at approximately 25% of its capacity because of a lack of suitable livestock production in ORTDM. With over 1.9

million cattle, sheep and pigs being enumerated in ORTDM, the abattoir only processes 3 575 animals per annum. This equates to only 10% of the livestock being processed with the remaining 90% being sold through auction. Most of which do not enter the formal food value add chain locally or elsewhere.

There is very little by-product that is not sold with the carcass or independently. According to URMA it produces 12 tons of by-product, mainly intestinal content and blood that is made available free as manure. Most by-product (ie hooves, horns, skins) is sold to formal and independent retailers. In the meat processing industry this by-product is often used by abattoirs to sustain their businesses. Just over 1.8 tons of by-product in the form of condemnations and foetuses are incinerated on site and the remainder taken to the landfill where by law it has to be buried and limed.

2.3.4. Poultry

The Chicken World Abattoir is situated just outside Mthatha. Their source of chicken is mainly from agents located outside of ORTDM. They used to be able to get chicken from poultry farms in the district, but these have closed. There is very little poultry production in the district with no major poultry farms. There has also been a decline in subsistence chicken production as people have moved into the urban areas. There is significant opportunity for poultry production, which is needed, but it requires funding by government in partnership with the private sector in the development of these poultry farms.

The abattoir has the capacity to process 500 chickens per day, but it is presently only doing 300 - 350 per day or just under 5 tons per week. This equates to the production of 0.93 tons of chicken being processed per day. This is equivalent to 228 tons per annum with percentage waste in the range of 0.4%, which means that waste is around 0.81 tons a year. A fully commercial abattoir would process between 25,000 - 30,000 chickens per day. By-product is the head, feet, gizzard and offal, which makes up 20% of the throughput. This by-product is sold to independent shops and restaurants in the district.

Umtata Cold Storage is the only cold storage facility identified in ORTDM that stores up to 140 tons of frozen chicken per week for distributed to wholesalers and retailers in the area. This facility produces about 0.5 tons of waste per month which is made available to pig farmers. All of the chicken stored at Umtata Cold Storage comes from outside the district. This gives an indication of the potential for chicken farming within ORTDM. However, one has to have the “end in mind” or the market that would be focused on in the production of chicken as well as the extent of competition in ORTDM. Fish and seafood

There are no known fish and seafood processing, manufacture or packaging facilities in ORTDM. A Strategic Economic Zone (SEZ) was being planned for the area around Umtata airport, but this does not seem to have come to fruition.

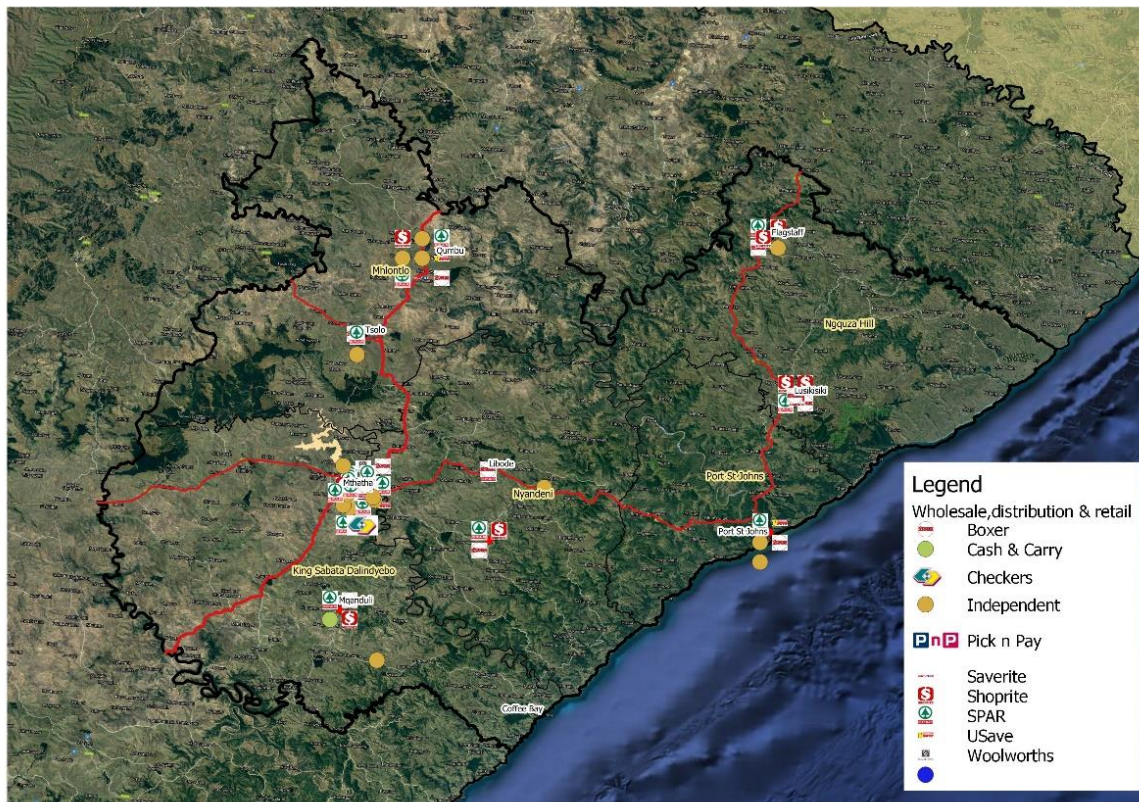
2.3.5. Milk

There are no known milk, cheese, cream or yoghurt processing plants in ORTDM.

2.4. Wholesale, distribution, and retail

2.4.1. Wholesalers, distributors & grocery retail

There are at least 14 wholesalers and distributors in the district that come from companies such as Browns, Rhino, Boxer and Spargs. Data on the extent of waste emanating from these facilities was obtained from Tata Waste, one of the only waste removal companies in the district. Their data suggests that wholesalers on average produce approximately 3.2 tons per annum of food waste out of a total of 161 tons of wet waste per warehouse/distribution facility per annum. The wholesale sector in ORTDM would produce approximately 44.8 tons of food waste per year.



There are at least 60 grocery retailers located in the towns within the different local municipalities with the highest concentration being in Mthatha. The Spar group has the largest number of stores at 23 followed by independent supermarkets with 16 and Shoprite with 11. Data collected by Tata Waste indicates that the 60 grocery stores could generate up to 380 tons of food waste each year. Food waste makes up approximately 8% of the total wet waste being collected from the grocery stores (4 370 tons per annum). It is important to emphasise that this calculation of the extent of food waste excludes amounts taken by pig

farmers prior to collection by the waste collection company. The extent of the waste will vary depending on the size and type of the grocery store.

2.4.2. Food commodities

2.4.2.1. Cereals

Only information on the extent of wet and food waste could be obtained for the wholesale, distribution, and retail sector in ORTDM. According to Oelofse et al (2021) only about 2% of the waste would be from the cereal commodity type in the wholesale, distribution, and retail sector. This would equate to approximately 7.6 tons in ORTDM.

2.4.2.2. Roots and tubers; oilseeds and pulses; and fruit & vegetables

Kei Fresh Produce Market (KFPM) is part of the Ntinga Development Agency, which is owned by the ORTDM. Ntinga is also the owner of the Umzikantu Red Meat Abattoir. KFPM is an emerging fresh produce market that has a trading floor space of 4 000m². Normally, KFPM has 4 market agents but currently it only has one, which means that it is operating at only 25% of its capacity. KFPM needs 4 full time market agents to operate at full capacity. The market agents have the responsibility to identify and establish relationships with farmers and the selling of their produce through the market. They also have the responsibility to manage the stock and losses while being transported and sold at the KFPM.

Normally, each market agent has at least 50 farmers that they work with to supply vegetables and fruit to KFPM. The problem is that they get only 20% of their fresh of produce from local small scale producers, who are mainly in the Port St John's, Tsolo, McClear & Ugi area. They get this fresh produce (mainly cabbages, pumpkins & carrots) from small scale farmers every 1 – 2 years, which is a problem as there is no consistency of supply. Consequently, they get most of their fresh produce from other districts, provinces and even from other countries, such as citrus (Sundays River in the Eastern Cape), potatoes & onions (Free State), apples (Western Cape), bananas (Port Shepstone & Mozambique) and tomatoes (Limpopo and East London).

Ntinga owns seven farms in the Swartberg area in the Greater Kokstad Local Municipality, which is outside of the ORTDM. On these farms they manage 2 500 head of livestock, grow vegetables and fruit; and have re-establishing the orchards on the farms. They use these farms to supply livestock to Umzikantu Red Meat Abattoir and fresh produce to the KFPM. There are significant opportunities in ORTDM to improve the quality of livestock through their heifer exchange programme (needs to be concomitant with grassland management) and the development of fresh produce farms, such as the planned banana farms in the Lusikisiki and Port St John areas. However, this requires significant coordination at the national, provincial, and local municipality levels to provide sufficient funding over at least a

10 year period and must involve the private sector & NGOs to assist in developing small scale farmers and markets.

KFPM normally has 15 staff members, but they now only operate with 8 staff on a weekly basis. These staff control the fresh produce coming to KFPM, conduct quality control, manage the cold rooms, and operate the market. This limited amount of fresh produce at the market results in the retailer's buying the stock from the fresh produce market in East London. In the past, they used to sell said 50% to retail and hawkers but now it is 60% to hawkers and 40% retail.

The table below shows the tons of fresh produce purchased through the KFPD over a 2 year period and the extent of food waste/discard generated. Detailed information on the extent of fresh produce purchased and the extent of discard per commodity type is monitored by KFPM on a weekly basis. The average annual discard of 12 tons is put in skips and initially people could help themselves to the food waste. However, people became sick and consequently, this practise was discontinued, so all of this food waste goes to landfill sites. This is lower than the 18 tons estimated by the CSIR (Oelefse et al, 2021).

Period: July 2019 - June 2021			
Commodity	Tons		
Potatos	4872	0.9	0.02%
Apple	38	0.3	0.69%
Banana	363	0.4	0.12%
Orange	175	4.3	2.47%
Cabbage	407	11.2	2.75%
Carrots	69	6.2	9.09%
Onions	693	0.0	0.00%
Pumpkin	21	0.0	0.00%
Tomatos	22	0.4	1.95%
Total	6 659	24	
Total Per year	3 330	12	0.36%

2.4.2.3. Meat

According to the SA Meat Processors Association (SAMPA) there is very little food waste associated with red meat throughout the value add chain. According to SAMPA there is only machine waste that makes up 0.5 - 2% of the throughput. This is in the form of ground meat, bone powder, floor waste and post-production off-cuts. However, most of this waste is reused in pets mince or bone meal and the remainder goes to the landfill.

A further 5 - 7% of meat is food waste in the retail sector because it is beyond its sell-by or consumption date. However, this waste is also normally reworked to create pets mince. Any form of food waste from the meat sector generally cannot be recycled because of it high bacterial loads and it is a legislative requirement for it to be sent to landfill.

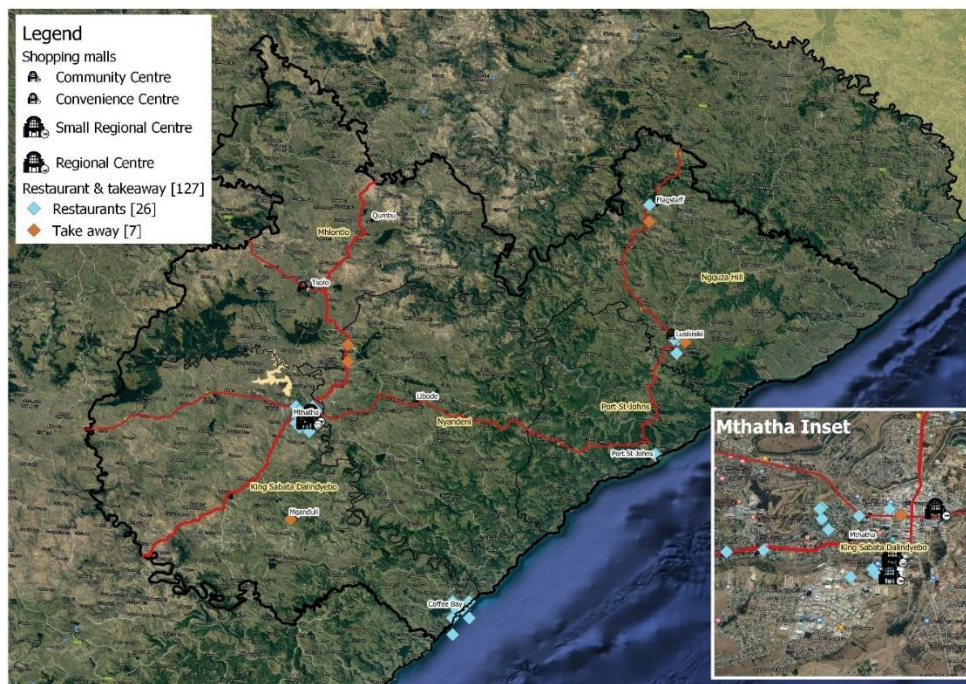
2.4.2.4. Poultry

The extent of the poultry waste in the warehouse, distribution and retail sector is probably similar to that of the waste in the storage of frozen chickens. According to the Umtata Cold Storage facility this is approximately 0.4% or 24 tons out of a total of 6 720 tons that is stored each year.

2.5. Consumption

2.5.1. Shopping malls & restaurants

There are at least 7 shopping malls of different sizes and types in ORTDM. Consequently, the extent of food waste that will be generated by them will vary quite significantly. However, Tata Waste has collected information on four of the major malls situated in Mthatha. The total food waste collected from these malls in one month was 4.4 tons or 52.8 tons per annum. With an average of 13.8 tons of food waste for shopping malls per annum, the total food waste of shopping centres in ORTDM would be approximately 96.6 tons per year.



Data was collected on sit down restaurants and takeaway stores with a total of 18 being identified in ORTDM. Tata Waste collects wet and food waste from 4 restaurants in the Mthatha area. The total food waste collected in one month is 13.9 tons, which equates to 166.8 tons per annum or 41.7 tons per restaurant in each year. The size of the restaurants as well as the months, would have a significant influence on the amount of food waste generated, with the December period being where 80% of the businesses and waste is generated.

2.5.2. Hospitality

Thirteen hotels, 13 lodges and 7 resort hotels have been identified in ORTDM. These are situated across the different local municipalities and will vary in size. The highest concentration of hotels is found in the Mthatha area where there is 9 hotels. Tata Waste collects refuse from these hotels in Mthatha with a total food waste of 116.5 tons per annum or average tons per hotel at 58.2 tons per annum. If one uses this as a proxy, then the 33 hotels, lodges and resorts would generate 1 920.6 tons each year.

2.5.3. Government services

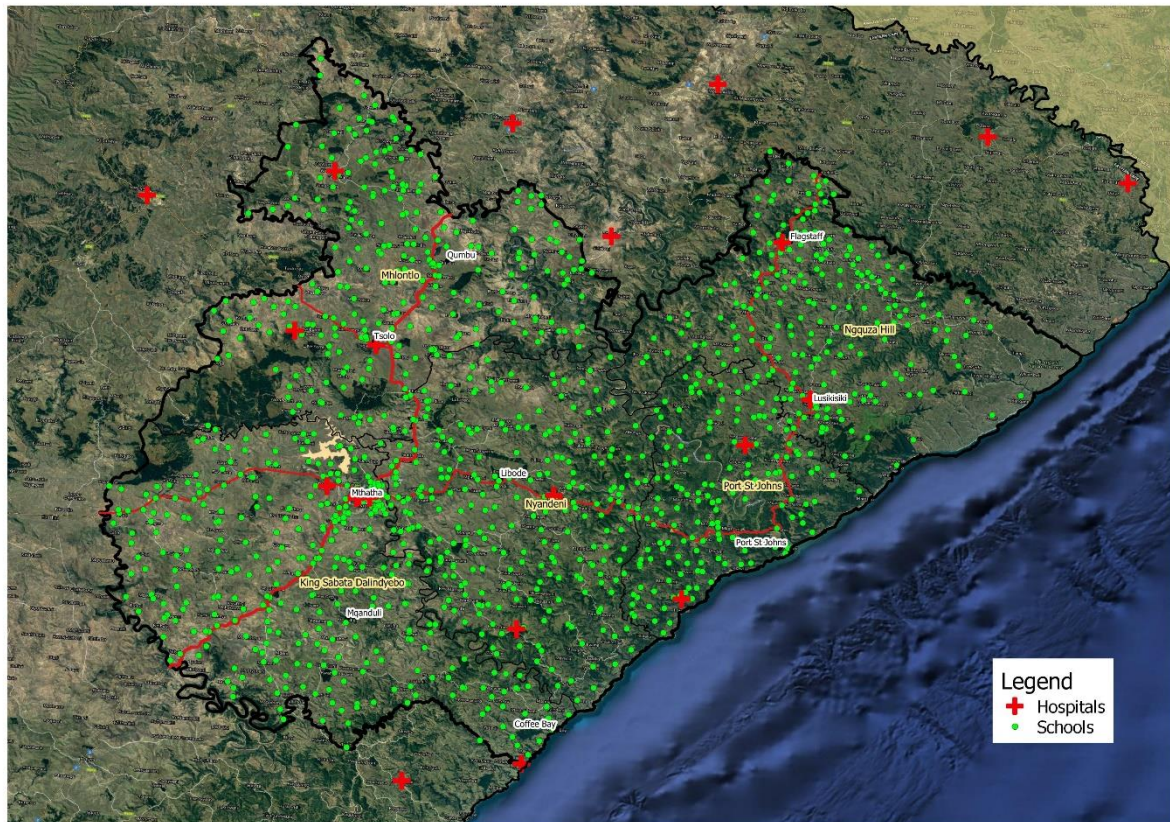
In the ORTDM there are 28 hospitals distributed across the different local municipalities with 9 being in Mthatha. From one of the hospitals in Mthatha, Tata Waste collects wet and food waste to the extent of 8.8 tons per month or 105.6 tons per annum. All the hospitals in ORTDM may potentially produce over 2 900 tons of food waste each year.

There are 637 primary schools located in ORTDM which are assumed to all will have a school feeding scheme. Vermigrand is involved in the recycling of food waste using vermi-compost and Bokashi bins that are dropped off and collected from private households as well as primary schools. Normally, four bokashi bins are collected per week from a primary school with food waste. This equates to 100 litres or 720 kgs or 0.8 tons per week. If one considers that there are 637 primary schools then the food waste using these proxy values would be 509.6 tons per week, 2 038.4 tons per month or 24,460.8 tons per annum. This is a significant amount of food waste that should be processed to form compost. It is important to emphasise that a lot of the food waste from primary schools is collected and used by pig farmers.

2.5.4. Business and residential household consumption

According to Statistics South Africa's Survey of Employees and Self-employed there is more than 43 000 businesses of different sizes in the ORTD. More than 57% of these businesses are commercial and independent wholesalers and retailers. Another 14% are in the transport, storage and communication industries. Using a very conservative figure of 9.2 kgs of food waste per month for individual businesses, a rough estimate of the annual amount

for the 43,000 businesses would be approximately 436 tons. The amount of waste would vary depending on the industry within which the business is situated.



According to 2020 estimates ORTDM has a population of over 1.5 million people and more than 732,000 households. Although the average household size will vary between formal and informal urban and rural areas, a conservative number of 2.2 people per household can be used. Data provided by Vermigrand estimates that for a household of 2-3 people in an urban area like Mthatha, they generate around 188 kgs or 0.21 tons of food waste per year. Consequently, all the households in ORTDM would generate more than 153 000 tons of food waste in a year. This is within the range identified by Chakona & Shackleton in 2017 for urban, peri urban and rural areas in selected towns of KwaZulu-Natal province.

What is critically important is that the information on tons of food waste presented above are validated against other sources of data at different stages of the food value chain. A key aspect of doing a study of this nature is that sufficient baseline geospatial information is collected so that a picture of the extent of waste at different stages of the food system can be approximated. Although the estimates of food waste provide some indication of the extent of the situation in ORTDM the extent of facilities generating the waste and the extent of the waste have not been validated. What is also missing is an understanding of the extent of food waste considering the different commodities.

3. Dealing with food waste in OR Tambo

The situation in ORTDM is that there is not much waste coming from the production; transport and storage; and processing and packaging stages of the food value chain. The only exception would be Umzikantu red meat abattoir. It is in the wholesale, distribution and retail sectors as well as in the consumption stages, which include the hospitality sector; government services; shopping malls and restaurants; businesses and residential households where there is the highest levels of food waste. The district and local municipalities are key players in the collection and disposal of refuse.

There is only one commercial refuse removal company in ORTDM and that is Tata Waste, which is situated in Mthatha. They provide dry and wet waste removal from government services (eg hospitals) and private sector facilities (eg shopping malls, wholesale and retail, food and hospitality). No other commercial refuse removal companies or organisations were identified in any of the local municipality of ORTDM. Vermigrand is an NGO that assists selected schools and households to process their organic waste.

Pig farmers in the district play a significant role in collecting organic waste and using it to feed their pigs. the extent of the pig farming industry is unknown but considering the throughput at Umzikantu abattoir there is a fairly significant.

4. Waste management services provided by the OR Tambo Municipality

An examination of the Integrated Waste Management Plan (IWMP) for ORTDM indicates a number of problems that hinder the establishment of an effective circular economy and the recycling of food waste. One of these problems is illegal dumping, which is assumed to be a consequence of insufficient refuse removal services being provided to certain communities within the different local municipalities of ORTDM. Each of the local municipalities are implementing management strategies to deal with illegal dumping.

Although the IWMP indicates that all formal and most informal residential areas as well as commercial industrial are all serviced, it is unclear as to whether all these areas are fully serviced. What is also clear is that the rural areas, which make up a large part of ORTDM do not have any form of waste management. Consequently, rural households either bury or burn their waste.

Several of the landfill sites have weighbridges but they are not always operational, which means that the collection of data and the extent of waste, especially at a local municipality level, is not being recorded. Waste characterization studies have been done in two local municipalities namely: Ingquza Hill (IHLM) and Nyandeni (NLM). It showed that in IHLM 13.1% was food waste compared to NLM with 45.9%. In 2020, the waste generation for

ORTDM was estimated at 331,000 tons of which conservatively, 30% is food waste. The equates to approximately 99,000 tons being food waste in ORTDM.

The map shows the location of waste management services in the ORTDM of the Eastern Cape. It shows the location of buy-back centres, landfills, recycling plants, and waste transfer plants.

4.1. Landfills

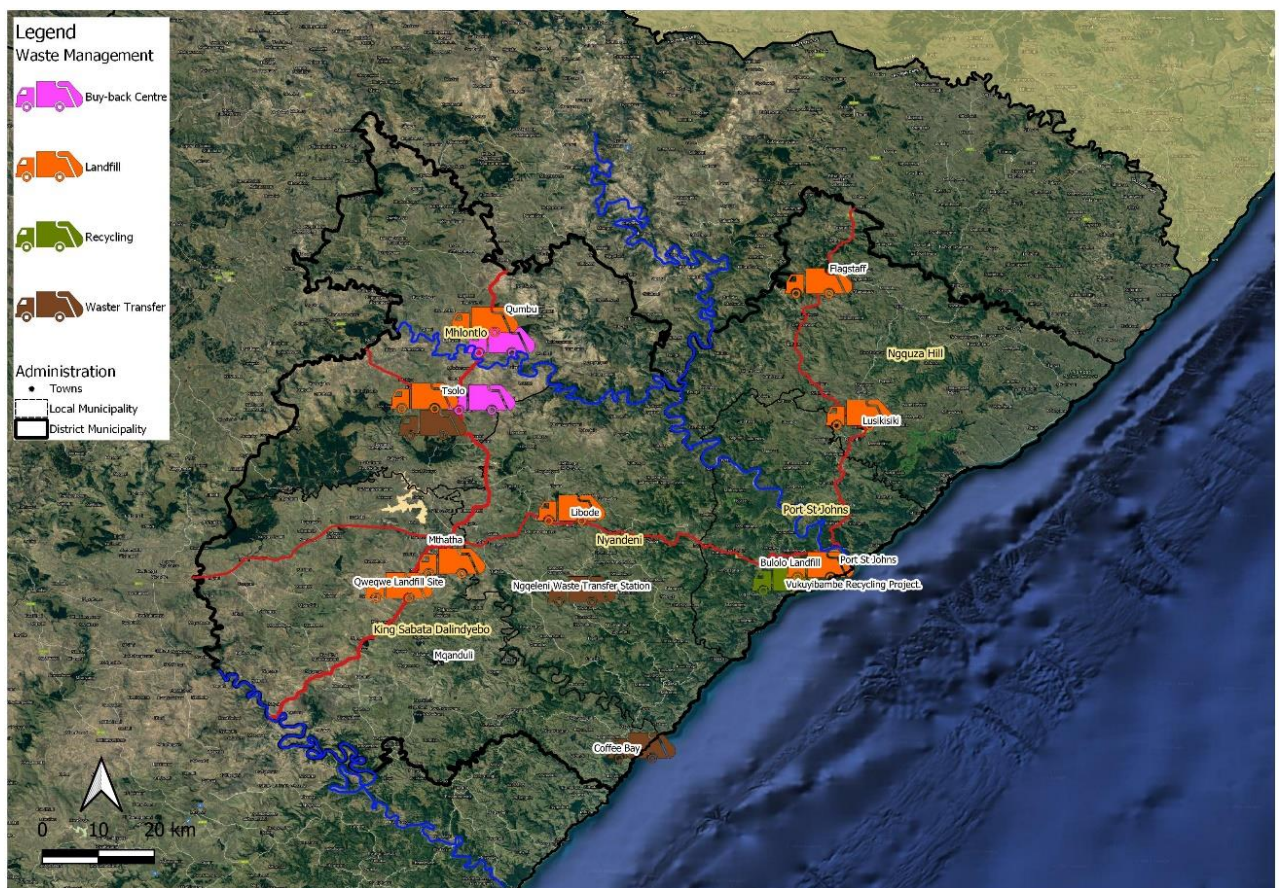
There are a total of 8 operational landfill sites in the O.R. Tambo District Municipality.

4.1.1. Port St Johns Local Municipality

Bulolo Landfill - this landfill was commissioned in 2005 and will be operational until 2025. The waste accepted at this landfill include general household waste, garden waste, and construction waste.

4.1.2. Mhlontlo Local Municipality

Qumbu Landfill - The waste accepted at this landfill include general waste as well as garden waste.



4.1.3. Nyandeni Local Municipality

Tsolo Landfill - The waste accepted at this landfill include general waste, garden waste, and construction waste. This landfill is to be converted into a waste transfer station.

Nqgeleni Waste Transfer Station - The only waste accepted is general waste.

Libode Landfill Site - This landfill site was opened in 2021 and accepts general waste, garden waste, and construction waste.

4.1.4. King Sabata Dalindyebo Local Municipality

Mthatha Landfill Site - The waste accepted at this site is general waste. This site is licensed to be decommissioned and rehabilitated.

4.1.5. Mqanduli Landfill Site

Coffee Bay Waste Transfer Station - The waste accepted here is general waste. This site was opened in September 2020.

4.1.6. Inguza Hill Local Municipality

Lusikisiki Landfill - The waste accepted at this site is general waste. This landfill is licensed to be decommissioned and rehabilitated in 2024.

Qwegwe Landfill Site - This site is still currently under construction.

4.2. Other waste facilities

4.2.1. Buy-back Centres:

A buy-back centre is a depot where individual waste collectors and street waste pickers can sell their recyclable waste.

The ORTDM has a Regional Recycling Programme, which is managed by Tulsaspark, who was appointed for three years to stabilise the programme. This programme employs approximately 640 waste pickers across all the local municipalities. The main Material Recovery Facility (MRF) for this programme is located at the Qumbu Landfill site. Recovered recyclable material is bailed at this facility and then sold to private companies in KZN, the Eastern Cape and Gauteng. This facility employs approximately 35 people whilst the other buy-back centres owned by the ORTDM employ a minimum of 3 people directly. The ORTDM has a total of 12 buy-back centres that are distributed across the local municipalities as follows:

- Mhlontlo Local Municipality – 3

- Nyandeni Local Municipality – 2
- Port St Johns Local Municipality – 1
- Inguza Hill Local Municipality – 2
- King Sabata Dalindyebo Local Municipality – 4.

4.2.2. Port St Johns MRF/PSJ Buy Back Centre

The waste accepted at this centre include cardboard, cans (aluminium and steel) and plastic (PET, HDPE, LDPE, LLDPE, PP). It is located at the entrance of the Bulolo Landfill site. This is an informal facility funded by the municipality known as the Vukuyibambe Recycling Project.

The municipality sorts and collects waste at the Bulolo landfill site and thereafter takes it to the Qumbu Landfill site, which has a formal MRF.

4.2.3. Tsolo By-back Centre

The waste accepted at this centre include cardboard and plastic (PET, HDPE, LDPE, LLDPE, PP). This Buy-back centre is located at the Tsolo landfill site.

4.2.4. Qumbu By-back Centre/MRF

The waste accepted at this centre include cardboard and plastic (PET, HDPE, LDPE, LLDPE, PP). This Buy-back Centre is located at the Qumbu Landfill site.

4.2.5. Lusikisiki Buy-back centre

Only general waste is accepted here.

5. A summary of information on the food waste streams in OR Tambo and the opportunities for community waste management systems

5.1. Food waste streams in OR Tambo

Table 5 below reflects the extent of food waste in tons per annum for each of the food commodities and stages of the food value chain with data collected in ORTDM from stakeholders & national organizations as well as through the use of proxy values. Using proxy values, the potential extent of waste during the production stage of the food value chain is reflected in the Table 1. However, most of the production is of a subsistence or small scale nature and consequently, waste generated is likely to be much smaller than that reflected in the table and is managed on site. As a result, the actual extent of food waste entering the circular economy is minimal during this stage. In most cases, the waste generated will be buried or used as animal feed.

FOOD COMMODITIES	FOOD VALUE CHAIN STAGES (Tons/annum)				
	Production	Post-Harvest Handling and Storage	Processing and Packaging	Wholesale, Distribution, Retail & Markets	Consumption
Cereals (Maize & Sorghum)	1 363.0	11.3	11.3		
Roots and Tubers (Potato's)	32 625.0	0.5	-	0.5	
Oilseed and Pulses	-	-	-		
Fruit and Vegetables	32 625.0	11.4	-	11.4	
Meat (red & poultry)	1 951.2	-	12.8		
Fish and Seafood	-	-	-		
Milk	-	-	-		
All commodities				541.0	182 980.8
TOTAL	68 564.2	23.1	24.1	552.9	182 980.8

As has been pointed out earlier, the limited food production results in minimal waste occurring within the transport and storage as well as the processing and packaging stages. With cereal production (ie maize and sorghum) and livestock farming being the key food commodities in ORTDM, there is a small degree of waste in their transport and storage as well as the processing and packaging stages. This has been determined by engaging with identifiable stakeholders, but it is likely that there are other stakeholders that could have contributed additional information. Most food commodities are imported from outside of ORTDM and consequently, extent of waste production increases in the wholesale, distribution, and retail stage.

The stage where there is the highest level of food waste is in the consumption stage. The consumption stage includes food waste from residential, businesses and government facilities. Most of this food waste is collected by local government refuse services and Tata Waste in Mthatha, which is then sent to the landfill sites. The percentage of this waste that could be attributed to different food commodities during the consumption stage by using percentages from the CSIR, is reflected in the table below. These percentages have been adjusted to reflect the proportional amount that each food commodity contributes towards the total food waste.

	Adjusted % of food commodities	Tons/annum
Cereals	18.2%	33 373.9
Roots and tubers	1.9%	3 452.5
Oil seeds and pulses	21.4%	39 128.0
Fruit and veg	25.8%	47 183.7
Meat	12.6%	23 016.5
Fish and seafood	2.5%	4 603.3

	Adjusted % of food commodities	Tons/annum
Milk products	17.6%	32 223.0
Total (tons/annum)		182 980.8

5.1.1. Summary

FOOD SYSTEM VALUE CHAIN					
FOOD COMMODITIES	Production	Post-Harvest Handling and Storage	Processing and Manufacture	Retail, Wholesale & Distribution	Household Consumption
Cereals			2		
Roots and Tubers					
Oilseed and Pulses				5	6
Fruit and Vegetables				4	
Meat			3		
Fish and Seafood					
Milk					
					1

- OR Tambo has low levels of production and consequently, post-harvest handling and storage. Maize (sorghum) and meat production occurs at a subsistence scale. There is very little waste emanating from these commodity types. Most waste emanates from retail, wholesale and distribution as well as household consumption.
- 2 250 tons white maize stored in Mqanduli Red Hubb Silo & Mill silo & milled per year
 - 900 tons local small scale farmers
 - < 22.5 (<1%) tons - waste
 - 788 (35%) tons – animal feed
 - 1 463 tons – packaged & sold to retail
- 1 456 animal units processed through Umzikantu Red Meat Abattoir per year but operating at 25% capacity. Table below shows throughput by animal type.
 - intestine content/blood by-product/waste – 626 tons per year
 - Condemnations and foetus waste – 2.3 tons per year

Period: July 2020-June 2021			
Livestock	Number	AU/ratio	AU
Pigs	2 367	0.250	592
Cattle	796	1.000	796
Sheep	412	0.167	69
Annual throughput	3 575		1 456

- Kei Fresh Produce Market (Mthatha) operating at 25% capacity
 - Annual throughput of 3.7 mil tons per year
 - Approximately 0.7 mill tons (20%) from local farmers per year
 - Approximately 0.01 mil tons (0.36%) tons discard/waste per year

Period: July 2019 - June 2021			
Commodity	Tons	Discard	%
Potatos	4 951 209	880	0.02%
Apple	39 027	270	0.69%
Banana	368 406	432	0.12%
Orange	177 664	4 382	2.47%
Cabbage	413 298	11 362	2.75%
Carrots	69 625	6 330	9.09%
Onions	704 520	0	0.00%
Pumpkin	21 100	0	0.00%
Tomatos	22 518	440	1.95%
Total	6 767 367	24 096	
Total Per year	3 383 684	12 048	0.36%

5. The wholesale, distribution and retail sectors are one of the largest generators of waste with over 424 tons being generated each year.
6. The sector that generates the largest amount of waste is households, businesses, and government services. The hospitals and school feeding schemes generate over 4 900 tons of food waste. However, it is households that generate the highest proportion of food waste in the consumption stage with over 182,000 tons potentially being generated across all the local municipalities of ORTDM. In this sector the food commodities that contribute the most to food waste would be fruit and vegetables, potatoes, meat and maize products.

5.2. Opportunities for community waste management systems for recovery, processing, and alternative uses in OR Tambo

With most of the food waste emanating from the warehousing, distribution, retail, and consumption stages, including the Kei Fresh Produce Market & the Umzikantu Red Meat Abattoir, the role of local municipalities in facilitating the separation of food waste from dry, wet, organic and recyclable waste is critical. It is highly unlikely that the waste management services of the local municipalities will be able to do this themselves with the resources available to them and consequently, Public Private Partnerships (PPP) should be established with companies like Tata Waste and NGO's like Vermigrand. Funding initiatives will need to be established over at least a 10 year period and incentives for the separation of food waste investigated to ensure long term sustainability. Special initiatives should be looked at for the processing of food waste from the school feeding schemes. By establishing these partnerships food waste can be separated and composted. The use of the food waste by the resourceful pig farming community should not be ignored and possibly formalised to ensure the effective growth of the industry.

The situation with food waste in this largely rural district is that it is quite minimal and that which does occur, is unavoidable. Better processes can be developed especially in the early stages of the food value chain to minimise the waste, but this is often processed on site, especially in the traditional areas. The potential for this waste to be used to feed people is low but there is significant opportunity for the processing of the waste to contribute towards better food production in ORTDM. A significant amount of the waste is used to prepare feed or to feed livestock, especially in the pig farming industry. There is no doubt that if sufficient investment is made in food waste management that a sustainable circular economy could be established in ORTDM. For this to occur requires the establishment of PPP in ORTDM.

The Integrated Waste Management Plan (IWMP) provides a thorough overview of the waste management services in ORTDM. The recommendations made in the IWMP relating to the management of the landfill sites remain valid. The key aspect that still needs to be addressed is the extent to which food waste can be separated and diverted for its appropriate reuse.

6. The food system actors (or stakeholders)

Status	Company	Name	Email	Phone
Interviewed	Agronomist - ECRDA	Luvo Qongqo	-	071 605 8679
Interviewed	Chicken World Abattoir	Mpho Sejosing	No Email	078 319 9177
Interviewed	Crop estimates	Rona Beukes	RonaB@dalrrd.gov.za	072 835 9525
Interviewed	Delta Built	Neelan Maduray	neelan.maduray@deltabac.com	071 682 1858
Interviewed	Groundnut Forum	Adrie Botha	-	082 376 5940
Interviewed	Kei Fresh Produce Market	Xhanti Jikwana	xhantij@ntinga.org.za	073 812 5379
Interviewed	Libazi Poultry Farm (Tsolo)	Akoana Libazi	akhonalibazi@ymail.com	083 522 8215
Interviewed	Love Chickens	Linga Dilinga	ldilinga@gmail.com	081 468 6759
Interviewed	Mantusini Dairy Farm	Mr Mogotswani (Chairperson)	mziwonkem90@gmail.com	073 648 8974
Interviewed	Milk SA		nico@milksa.co.za	012 460 7312
Interviewed	Red Meat Levy Admin	Bert Pienaar	bertp@levyadmin.co.za	082 702 1081
Interviewed	South African Meat Processors Association (SAMPA)	Peter Gordon	peter@sampa.org.za	083 255 3486
Interviewed	Tata Waste	Wayne barton	wayne@tatawaste.co.za	083 262 7406
Interviewed	Tata Waste	Linda Golimpi	keyaccounts@tatawaste.co.za	071 586 2585
Interviewed	The Movement in Africa	David Epstein	David@themovementinafrica.org	084 440 9613
Interviewed	Umtata Cold Storage	Walter Langley	wlangley@sovfoods.co.za	047 531 1274
Interviewed	Umzikantu Red Meat Abattoir	Xola Mapatwana	xolam@ntinga.org.za	078 619 8563
Interviewed	Umzikantu Red Meat Abattoir	Olwethu	olwethum@ntinga.org.za	082 581 8977
Interviewed	Vermigrand SA	Nomalungisa Mpati	lungimpat@gmail.com	0796185356

Status	Company	Name	Email	Phone
Contacted	Agricultural officer - ECRDA	Pakama Maki	-	079 697 3201
Contacted	Agricultural Produce Agents Council (APAC)		francois@apacouncil.co.za	011 894 3680
Contacted	Agricultural Research Council (ARC)	Dr J. Chirima	ChirimaJ@arc.agric.za	
Contacted	Dohne Agricultural Development Institute			
Contacted	Eastern Cape Rural Development Agency (ECRDA)		-	043 703 6300
Contacted	Farmers Livestock Agents (Livestock Auctionners)	Graham Joyner		0823290233
Contacted	Grain SA	Marinda	marinda@grainsa.co.za	
Contacted	Grain SA	Petru Fourie	petru@grainsa.co.za	071 683 2099
Contacted	in2food	Jane Nock	Jane.Nock@in2food.co.za	
Contacted	Mqandulu RED silo & mill	Kennedy Mavata	redhubbmanagement@gmail.com	076 148 2899
Contacted	National Emergent Red Meat Producers' Organisation (NERPO)	Dr Florence nherera	fsd@nerpo.org.za	012 492 1383/083 677 8631
Contacted	Oil & Protein Seeds Development Trust	Gerhard Kuen	oliesade@opop.co.za	011 234 3400
Contacted	Pineapple Growers' Association	Lee Botha	-	046 625 0515
Contacted	Potatoes SA	jano Bezuidenhout	jano@@potatoes.co.za	
Contacted	Red Meat Abbatoir Association	Gerhard Neethling	gerhard@rmaa.co.za	082 551 7232
Contacted	Red Meat Industry Foun		-	076 232 3357
Contacted	SA Grain Information Service (SAGIS)	Nico Hawkins	nicoh@sagis.org.za	
Contacted	SA Pork Producers Organization (SAPPO)		-	012 100 3035
Contacted	SA Poultry Association	Mr Izaak Breitenbach	izaak@sapoultry.co.za	011 795 9920
Contacted	SA Subtropical Growers Association	Kate Hamilton	-	015 307 3676/7
Contacted	SA Waste Information Centre			012 399 9831/32
Contacted	Siq	Eugene du Preez	eugene.dupreez@siq.co.za	082 854 3724
Contacted	Sorghum Trust		laura@llagric.co.za	
Contacted	The South African Avaco Growers Association	Kate Hamilton		015 307 3676/7
Contacted	Umtiza Co-op	Chowe Verdana		083 419 0761

7. Literature

Chakona, G. and Shackleton, C.M. 2017. Local setting influences the quantity of household food waste in mid-sized South African towns. PLoS ONE, 12(12).

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Oelofse, S.H.H., Polasi, T., Haywood, L. and Musvoto, C. 2021. Increasing reliable, scientific data and information on food losses and waste in South Africa. Waste Research Development and Innovation Roadmap Research Report, CSIR, CSIR External Report CSIR/SPLA/SECO/ER/2021/0019/A.

8. Technical definitions

Composting is the controlled aerobic biological decomposition of organic matter, such as food scraps and plant matter, into humus, a soil-like material. Aerobic is the decomposition process in the presence of oxygen.

Domestic solid waste (General Waste) is solid waste generated by single or multifamily residential dwellings, and solid waste of a non-hazardous nature, generated by wholesale, retail, institutional or service establishments such as office buildings, stores, markets, restaurants, theatres, hotels, warehouses, industrial operations and manufacturing processes.

Pyrolysis is the thermos chemical decomposition of organic material at elevated temperatures (400°C to 600°C) in the absence of air or oxygen.