
FOOD FORWARD PROJECT FINAL SUMMARY REPORT & RECOMMENDATIONS

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1. PROJECT CONTEXT

1.1. Overview

In July 2014 The Western Cape Government's 110% Green programme launched the 'Food Forward' initiative to raise awareness around food wastage, catalyse action and investigate potential inefficiencies in the food value chain. The project aimed to encourage a reduction of food wastage in the Western Cape Province, by mobilising key stakeholders to decrease inefficiencies at every stage of the food chain, from production all the way through to consumption.

This report outlines the lessons learned over the year of project operation, and recommends a few potential areas of future intervention and research with specific regard to food waste and food chain inefficiencies.

1.2. Project rationale

Figure 1 shows the total food supply chain waste per stage in South Africa, as estimated by the Council for Scientific and Independent Research (CSIR) (Oelofse & Nahman, 2012). As stated by the CSIR, the figures are not derived from any South African specific research, but are rather based on high-level statistics displayed for the food waste situation in "Sub-Saharan Africa" as reported by the FAO (e.g. Gustavsson et al., 2011). The original research was conducted by the Swedish Institute for Food and Biotechnology (Oelofse & Nahman, 2012). In other words, the data from which figure 1 was created was meant to give a very rough estimate of the potential amount of food waste occurring in South Africa.

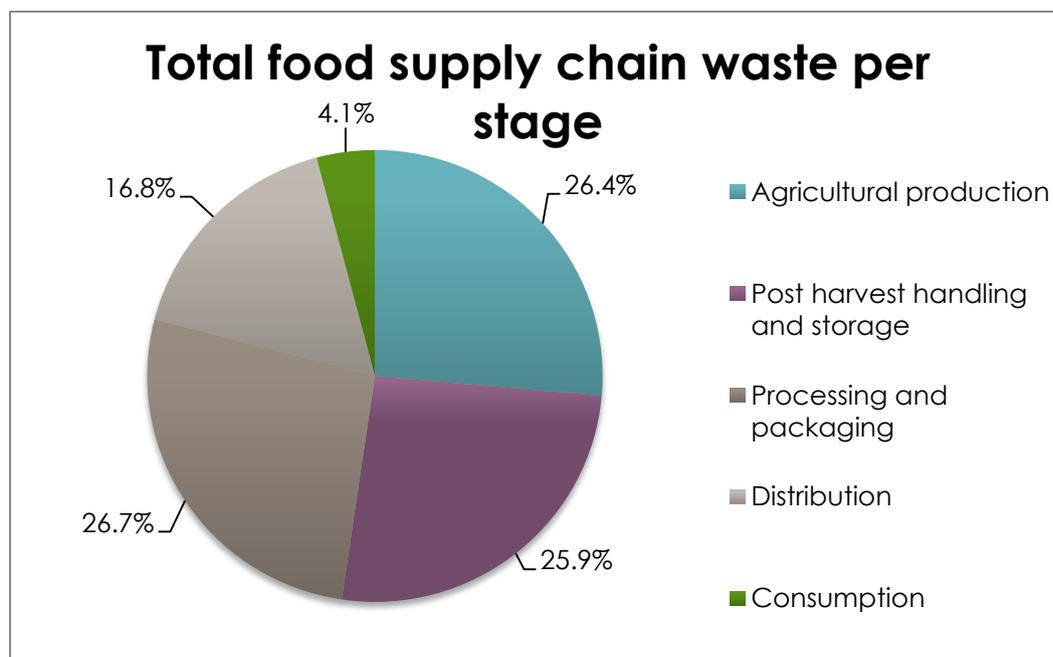


Figure 1: Theoretical total of food supply chain waste per stage in South Africa (Oelofse & Nahman, 2012)

Figure 2 is also derived from the same CSIR estimates, and details the total percentage of food waste as a portion of total food production, as well as the breakdown of waste and production estimated per commodity group.

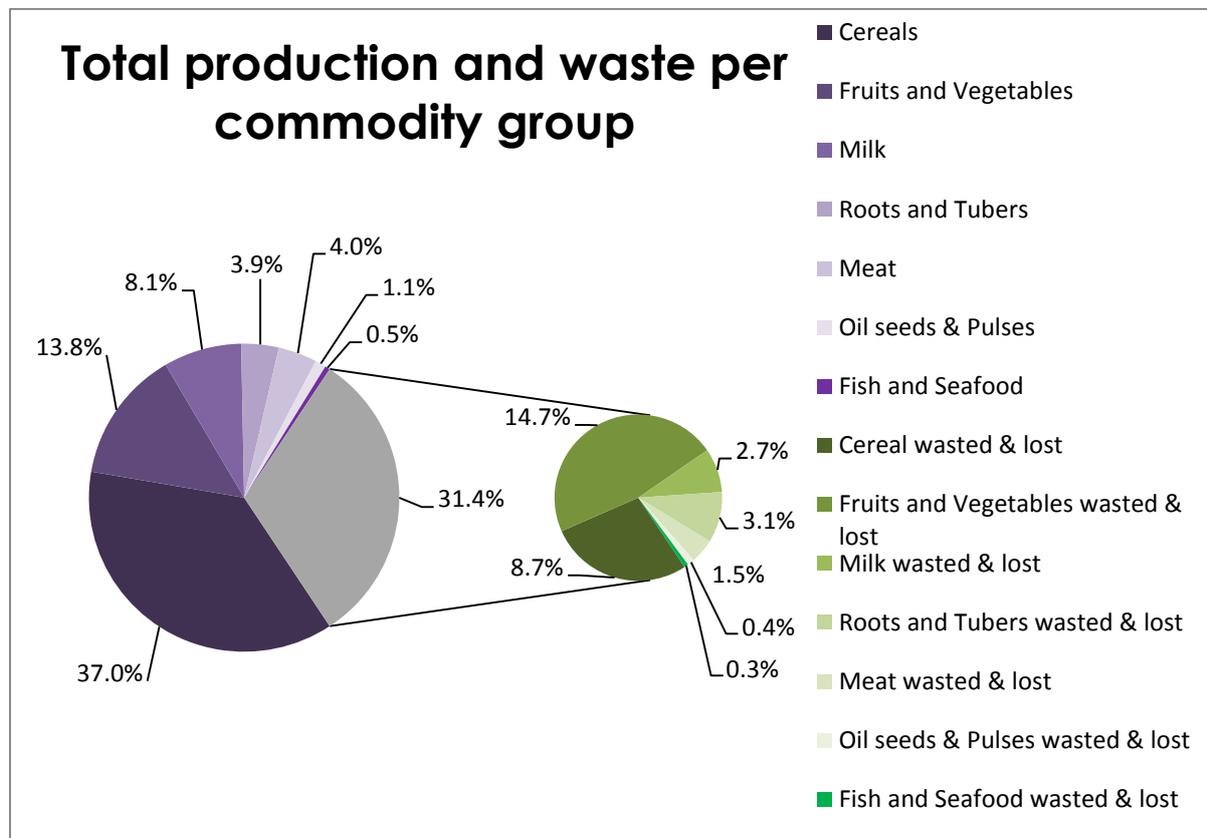


Figure 2: Theoretical split of food supply chain waste per commodity group in South Africa (Oelofse & Nahman, 2012)

A global partnership to develop a Global Food Loss and Waste Protocol was initiated at the 3rd Global Green Growth Forum (3GF) in 2013. Participation in this international effort as part of the Western Cape Government's Green Economy Strategic Framework, along with these recent estimates around food waste in South Africa, helped to form the rationale for the Food Forward project.

2. PROJECT PLAN

The chosen strategy was to conduct a series of food chain excursions or “experiential tours” across the Western Cape, for stakeholders to collaborate and learn through first-hand experience and discussion. The idea was to use these excursions to better understand the food system and some of the key commodities in the Western Cape Province, attempting to identify connections between the various role-players and the areas of biggest concern with regards to food waste and food chain inefficiencies.

2.1. Selection of areas

Figure 3 shows an overall picture of the food production regions of the Western Cape. Using this map and food production data provided by the Western Cape Government Department of Agriculture, five local municipalities were chosen, one in each of the five district municipalities in the Western Cape.

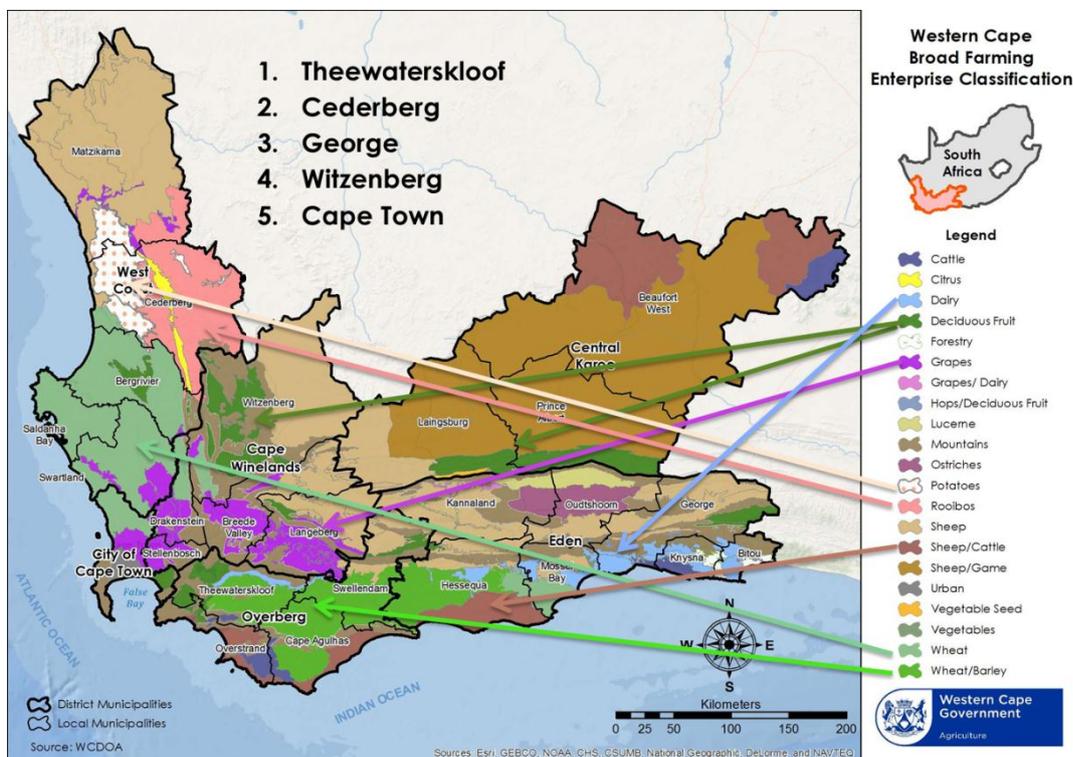


Figure 3: Food production regions/Food Forward tours (Western Cape Government Department of Agriculture website, 2014)

The municipalities of Theewaterskloof, Cederberg, George, Witzenberg and Cape Town were chosen because they were deemed to collectively produce the widest range of commodities. The idea was to expose participants to a wide range of commodities in order to gain as much insight as possible into the similarities and differences between food commodity industries. However, the choice of municipalities was also influenced by the availability of food chain activities to visit in each municipality and the ability and/or willingness of the various local stakeholders to engage and accommodate visitors at the selected facilities. All tour programmes can be found under Annexure 1.

At the end of each tour a report was generated by the project manager, aimed at highlighting all the lessons learnt and insights that arose out of each visit. The important findings and insights from the five tours, along with additional information collected throughout the year, have been consolidated in this final project report.

2.2. Tour participants

It was thought that the best results and insights would come from a broad spread of stakeholders. Therefore, various stakeholders relevant to the food system and food related activities in each area were invited to the five different tours. Tour participants included delegates from local and regional government, food and food waste related organisations, companies, forums, industry associations, research institutions, agro-producers, food processors, distributors, retailers and waste handlers. While not every stakeholder group was present on every tour due to resource, time, activity capacity and stakeholder availability constraints, all tours were well attended, with an average of 17 stakeholders per tour.

A list of participating stakeholders and their contact details can be found in Annexure 2.

3. PROJECT IMPLEMENTATION: SUMMARY OF TOURS

3.1.1. Theewaterskloof – 26th/27th August 2014

SAB – Malting and brewing waste

SAB uses large quantities of barley to make malt for the beer process. Although beer is not technically food, barley is used widely as a cereal and for many other staple dishes. Therefore waste along the chain is a potentially wasted resource, and efficiencies are important. The group learnt about the quality standards applied when selecting barley, as well as the various processes it undergoes and the efficiencies thereof.



Figure 4: Barely fermentation pit - SAB

Swap-shop – Recycling for fresh produce

The swap-shop exchanges fresh food items not sold at the local market for dry recyclables. This provides a great opportunity for low income individuals to increase their food security with dual environmental benefits. The possibility to expand and replicate such programmes, in order to create jobs and redistribute left over food, was the focus of this visit.



Figure 5: Swapshop recycling collection in one morning - Genadendal

Genadendal emerging farmers – Vegetables

The small scale farmers group in Genadendal provides fresh produce to local and Cape Town markets. High level research points to the farm level as a significant contributor to food waste, however, farmers here claim differently. The visit aimed to investigate farm level activities to see what kind of waste is produced on the farm level, why and how much. The idea was to use these encounters to help inform the target focus for future interventions.



Figure 6: Small scale farming harvest - Genadendal

Genadendal Frozen Vegetables

Genadendal Frozen Veg prepare and freeze freshly cooked vegetables. The visit highlighted the kind of processes that operate and what could lead to food wastage, as well as the quantities of unavoidable waste generated, e.g. peels, tops and tails. The aim of the visit was also to investigate where the inefficiencies are and how they can be addressed, including utilising by-products.



Figure 7: Broccoli dust left over after vegetable steaming and freezing - Genadendal Frozen Veg

Kromco – Apple packing

The Kromco packaging facility helped to give the group a good understanding of the types of technology already employed to reduce wastage in a large scale operation at the packaging stage of the food chain. The visit also helped participants to understand the level of existing efficiency of certain, large and commercialised food systems, and how this relates to the export market and food waste that occurs past the farm/factory boundaries.



Figure 8: Apples sorted awaiting packing - Kromco

Elgin Fruit Juice – Apple and pear juice

The Elgin Fruit juicing facility showed damaged, broken and under-quality fruit being used to make juice. This helped the group to understand more about the quality standards applied to fruit, and how this could create waste. The bio-digester was also a crucial angle, showing the post juicing value-add and energy production potential.



Figure 9: Methane capture dome of the bio-digester - Elgin Fruit Juice

3.1.2. Cederberg – 16th/17th October 2014

XSIT – Sterile Insect Technique – Citrus pest control

XSIT uses the Sterile Insect Technique to control unwanted pests on plantations in the fruit industry. Minimising pest damage allows greater value to be attained for the produce and reduces the amount of wasted and lost usable food and value. The visit included an overview and walking tour of the XSIT facility, and focused on how the facility works, the scientific process and how this helps to reduce pest damage.

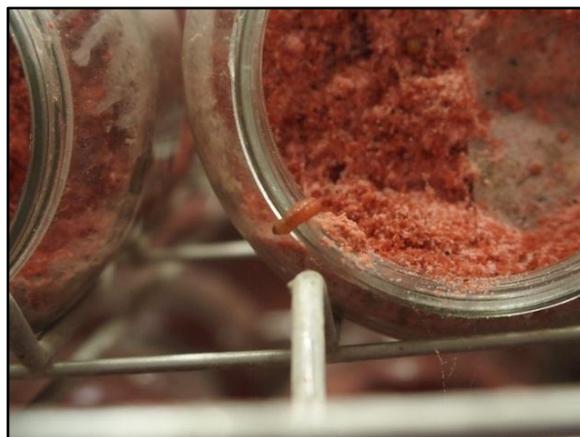


Figure 10: Larvae emerging from dyed feed - XSIT

ALG – Fruit growing, packing and marketing - Citrus

The group was given an overview and tour of the ALG citrus growing facilities and pack-house. The discussion revolved around the processes used on the farm, right through to where the fruit leaves the pack-house. This included which technologies and techniques are employed to minimise damage and waste throughout the supply chain. Insights were also gained regarding the value of having a handle on the whole chain of operation, including the marketing and a product tracking system.



Figure 11: Freshly extracted citrus oil - ALG

Stephan & Seun – Potatoes

The visit included a tour of the Stephan en Seun potato farm and pack-house. Discussions were had around the processes used on the farm, and what exactly the most likely culprits for lost, damaged and wasted produce are. This helped to give the group a better understanding of the potato industry, overall efficiency and waste generation in the potato supply chain.



Figure 12: Digger scooping sand and potatoes – Stephan en Seun

Elandsberg Eco-Tourism – Rooibos

The group was given a tour of the Rooibos production, fermentation, processing and packaging facilities at the Groenkol Rooibos tea estate, run by Elandsberg Eco-Tourism. The visit outlined the various stages of rooibos production and processing, helping participants to gain a better understanding of the tea industry and the potential for waste in the industry.



Figure 13: Leftover rooibos stalks ready for composting - Groenkol

3.1.3. George – 6th/7th November 2014

Agripark – Agriculture and agro-processing

The Agripark is a proposed project to be built in George, using methane gas from the local sewage waste treatment works to power an agro-processing facility. Nutrients will also be extracted from the treatment works, and will be used to make compost for growing plants, which will then be processed in the agro-processing facility and dried using solar driers. Participants were given a green-fields tour of the proposed site next to the treatment works, as well as an explanation of the stakeholder engagement process already underway.



Figure 14: Prof. Auerbach explaining the Agripark concept on the proposed site - George

De Greunen farms – Dairy and Blueberries

Delegates were given a tour of the dairy section of the farm, including feeding, illness management, milking, storage and milk transport. The group was then taken to see the blueberry production side of the farm, where they learnt all about weather management controls, harvest economics and labour issues.



Figure 15: Blueberries on the bush - De Greunen farm

Eden Biofuels – Waste cooking oil

The group was given a tour of the Eden Biofuels facility, with an explanation of the biodiesel creation process, including input resources, output fuel and by-products. Discussions revolved around the price setting of bio-diesel, engine conversion requirements, availability of waste oil and market competition.



Figure 16: Separated biodiesel and water – Eden Biofuels

Lakeland Foods – Additives for the dairy industry

The production of packaged additives and flavourants for the dairy product industry was explained to the group at the Lakeland Foods factory. Here the group learnt about some of the indirect uses of fruit that is sub-standard, oversized or blemished. For example, oversized or blemished strawberries and peaches are cooked and chopped to be used for fruit bits in a yoghurt mix.

Lancewood Cheese – Cheese manufacturing

Delegates were given an overview and factory tour of the Lancewood Cheese factory, including a look at all the input resources, resultant products, by-products, as well as the primary/secondary product markets. The group was shown how leftover whey from the cheese making process is dehydrated and prepared as an additive to other food/nutrition products.



Figure 17: Coal boiler used for whey dehydration - Lancewood

3.1.4. Witzenberg – 4th December 2014

Willow Creek – Olive oil

The first stop of the tour was the Willow Creek olive farm, where the participants learnt about the olive industry and the process of olive oil extraction. The discussion revolved around what happens to the by-products of the olive oil industry, especially pulp and pips, as well as how the weather affects harvest.



Figure 18: Drying waste pellets - Willow Creek

At Source – Fried fruit and nuts

The group was exposed to the inner operations of the At Source dried fruit and nuts facility, where pre-dried fruit from various fruit farms is cleaned and packaged, ready for sale. Specific focus was given to damaged, blemished and substandard produce.



Figure 19: Workers removing blemishes - At Source



Figure 20: Dried fruit roll - At Source

Klondyke – Cherries

The Klondyke cherry farm is a popular destination for tourists who come to picnic on the grounds and pick their own cherries. Participants got the chance to learn about the cherry industry and how they handle substandard and excess produce through the tourism industry. They also learnt about the weather and economic related factors effecting yield and production.



Figure 21: Freshly picked cherries - Klondyke

3.1.5. Cape Town – 4th/5th February 2015

CTICC – Food supply chain and waste management

Participants were given a tour of the CTICC kitchens, food prep areas, fridges, waste management system and waste storage area. The excursion gave great insight into the logistics involved and potential challenges in running such a large catering operation. Specific focus was given to the food waste separation system and the bin management and tracking process.



Figure 22: 3-bin waste separation system – CTICC

FNB Portside - Food supply chain and waste management

The group was given a similar tour to that of the CTICC, however, only the dry waste and recycling was focused on, as an adequate food waste solution was not yet in place at the Portside building.

Cape Town Market – Fresh produce distribution centre

The Cape Town Market gave the group a first-hand look at the operations of a large fresh foods distributor, with specific focus on the auction process, food handling, storage, ripening, waste handling and separation for composting and re-distribution.



Figure 23: Food waste macerator – FNB Portside



Figure 244: Damaged/spoiled goods ready for animal feed – Cape Town Market



Figure 25: Edible goods ready for donation – Cape Town Market



Figure 25: Spoiled goods - Woolworths Distribution Centre

Woolworths Distribution Centre – Woolworths branded goods

The Woolworths Distribution Centre was an integral part of the tour, showing the delegates the complexities involved in managing the food supply chain at the retailer level and what it requires to run a large, multi-product distribution centre. The group learnt about the intricacies of efficiency and the importance of co-ordination and communication in such a high-volume, high-pressure environment.

4. PROJECT FINDINGS

4.1. Findings context

A range of facilities of different size and scale were visited, the majority of which were commercialised and mechanised operations. Fewer smaller scale farmers and emerging facilities were visited, which was largely due to the fact that there were fewer smaller scale and emerging facilities immediately apparent through the available networks (and contactable within the time frame). Despite this, a total of 22 facilities were visited within the project timeframe.

The project was not able to look at all commodities in the Western Cape, or all facilities dealing with one single commodity, however, a wide range of commodities were investigated including: Apples, pears, oranges, cherries, blueberries, potatoes and other assorted vegetables, rooibos tea, used cooking oil, dairy (milk and cheese), olives, dried fruit & nuts.

The exercise was a visual and verbal exercise and not a waste audit; therefore there was no specific quantification or significant and accurate data collection aspect to the project. The project was framed as a non-accusatory learning experience and most were willing to share sensitive information regarding food waste management quantities and challenges. However, it was sometimes difficult to see or extract accurate information about the exact percentages of waste and losses, and some facilities appeared to be more defensive and hesitant to reveal such information. This is believed to be largely due to the negative connotation around waste, where facilities may have felt embarrassed or threatened to reveal the actual amounts of waste. But regardless of these limitations, some rather interesting findings emerged.

4.2. General insights from the food value chain

A number of general lessons will be useful for helping to increase efficiencies along the food chain and facilitating a reduction in food waste. These include, but are not limited to, the following:

- Being aware of the entire chain helps a single entity to increase efficiencies at every stage by being able to tightly monitor and control each stage or potential incident.
- The opportunity for upskilling, constant development and the ability of employees to climb the ladder is important to motivate employees, and to keep the business at maximum productivity. A system that allows shares of the company to be attained by all employees is an incredibly effective strategy to keep employees motivated and invested in the success of the business.
- Government needs to help facilitate greater efficiency in the food industry through supporting a systems approach and closed-loop project design.
- The lines are sometimes blurred when differentiating between organic waste (peels, off cuts) and food waste (whole pieces). This distinction needs to be clearly made.

Another interesting lesson was the fact that it is difficult to attribute on-farm losses/wastage to the actual farmer or their practices, especially when weather or harvest-timing related. This raises questions about where to draw the line in terms of the following:

- To what extent does reintroducing damaged, sub-quality and undersized goods (i.e. lost produce) to the soil add to the recharge of soil micronutrients and biological activity (and therefore the soil health)? And if it is in some cases critical, should this be classified as food losses?
- The next question is in regards to the economics of collection effort vs marginal profit increase. If a certain extra percentage of additional harvest is not economically viable to extract due to harvest times, seasonal variances, labour limitations etc., can these left-overs be directly attributed to management issues and therefore classified as on-farm food losses/wastage? Perhaps the definition of food wastage should also include the consideration of what is economically available and/or actually harvested produce?
- The same can be said for variable climates, which may prematurely knock fruit from a tree, deeming it unusable. While this may be lost food, there also often may be little farmers can do to prevent this after a certain level of intervention. However, smaller scale farmers may have more scope to improve in this area but may lack the knowledge or resources to do so.
- Even if previously edible but now damaged food is fed to animals, for example, and not “wasted”, it is still technically food waste if it didn’t reach humans. However, to feed those animals raised for human agricultural purposes another way would still involve growing crops and using resources. So should the food waste fed to animals still be classified as “food waste” if both ways of feeding animals impact on less food available for human consumption? This is perhaps debatable, but maybe the underlying issue is rather an overreliance on animals for our nutritional requirements. In general, issues of this nature need to be looked at from a systems perspective, in order to better understand the linkages between industries and the often overlapping costs and benefits.

4.3. Specific insights regarding food waste

In terms of the facilities visited during the Food Forward project, not a lot of food waste appears to occur at the large scale and highly commercialised operations viewed in the Western Cape. Since input costs are high, the industry is usually forced to use resources efficiently, as lost product means lost profits. Therefore it appears as if simple economics regulates food waste and losses at these facilities, at least up until the distribution stage.

In general, there are a number of key lessons that have been picked up throughout the project, which help to shed light on both the actual situation in the Western Cape (compared to what the high-level stats say for South Africa) and the possible factors which help to create or reduce the occurrence of food waste. The latter is

largely reiterating what we have seen in many international case studies (e.g. Gustavsson et al., 2011; Lipinski et al., 2013), but begins to show how the South African, and more specifically the Western Cape, context differs from the picture painted for the rest of sub-Saharan Africa.

4.3.1. Technological challenges and opportunities

Some very innovative solutions already exist, and are having serious impacts on food loss reduction. For example, the insect sterilisation technique has reduced the total percentage of on-farm citrus losses by nearly 50% compared to several decades prior. Furthermore, very specific and well managed cold-chain operations at many of the facilities visited help to keep each individual product at the optimal temperature in order to maximise its longevity.

Contrary of this, however, due to profit stabilisation strategies introduced in certain industries (trying to maintain an all-year-round supply and/or a year-to-year supply buffer of a seasonal fruit, for example), wastage can be shifted to the consumer end of the chain. This is due to the fact that although 6-10 months of storage keeps fruit fresh and crisp, it often then perishes much faster once it has arrived at a consumer's home. Not to say that this method of operation is causing wastage, especially factoring in the benefits of a year-round supply, but it may contribute to a slight skewing in the perspective regarding where and why food waste is being generated.

A potentially large technological barrier relates to access, where smaller scale producers, manufacturers or processors may be restricted from purchasing or hiring certain technologies or equipment due to cost. This may lead directly to lower overall efficiencies in certain parts of the food supply chain where small scale operators are in the majority.

4.3.2. On-farm losses

With respect to farm level losses, the amount of product wasted or lost on the farm level comes down largely to two main (but not ultimately exclusive) factors:

- (1) Economics – Where it is just not feasible to collect all the fallen/ripe fruit or harvest regularly enough in order to use all the fruit before it falls off the tree or is eaten by birds/insects. Additional strategies for removing and utilising excess/fallen fruit, if the economics work, could be a good way of creating opportunities in the agro-processing sector.
- (2) Weather – Where variability in weather patterns and extreme conditions cause large losses of flowers and young fruit before it has a chance to grow. The ability to predict, prepare for and prevent damage from adverse weather events is playing an increasingly important role in reducing on-farm losses. The impact of weather variability and extremes can be significant, even when mitigation strategies and capital are available. However, adverse weather conditions are still likely to impact smaller, less commercial operators more severely.

In general, smaller scale operations in particular need huge support in this area, where they may not be able to access knowledge, technology or finances to help facilitate the introduction of such climate related adaptation/mitigation measures. An online tool for weather related decision making has been developed by the Western Cape Department of Agriculture, which allows users to access all sorts of information regarding production region characteristics and weather averages. However, it is unknown how widely this is accessible and usable among smaller scale producers.

4.3.3. Processing and packaging

The processing and packaging stages of the food chain visited in the Western Cape during the Food Forward tours appear to be rather efficient. As mentioned, this is largely due to the built in economic incentive to minimise losses and damage, as well as create value out of by-products/waste streams. There are many companies who have not yet been able to fully utilise their food waste, however, many are in the process of investigating the options. Moreover, the amount of produce that is wasted or lost is still a much smaller percentage than outlined in the CSIR report (2012) for South African food waste. For example, the dried fruit processing and packaging company, At Source, diverts less than 1% of total edible and saleable produce for value added by-products and animal feed, leaving no food waste for landfill.

Further examples are shown in the apple industry, where Kromco sorts and packs apples for local and international markets. Here, a sophisticated imported system of operation is in place, where scanning and sorting machinery maximises the sorting efficiency, and the natural floatation ability of apples is used to wash, transport and collect the fruit, thus minimising damage and wastage during the process (any resulting waste goes to animal feed). A large percentage of damaged or compromised apples in the Elgin region go to the Elgin Fruit Juice (EFJ) company (or similar, e.g. Appletiser), where they are turned into fruit juice and fruit juice concentrate. EFJ specifically also converts any pulp/non-juice-able/rotten apples into usable methane to drive their electricity generators, currently supplying over 50% of their own energy¹.

The ALG citrus facility uses a similar process, whereby all additional damaged or unsalable produce is collected and processed to create citrus oil and juice. The pulp is also then used for cattle feed.

4.3.4. Distribution level wastage

Another example is the Cape Town Market – a distribution centre business responsible for the distribution of around 60% of the fresh vegetable produce in the Western Cape – where it is reported that total waste is less than 1% of the total

¹ This raises interesting questions about whether certain green economy technologies and industries would even be feasible if it weren't for some level of waste creation along the food chain.

produce throughput. The Cape Town Market is able to minimise wastage and losses at its facility due to the technology available (cold chain, packaging, ripening control systems etc.) and scale of the operation, both which help to make costs manageable and keep waste to a minimum. This is vastly different from the roughly 16% wastage said to result in the distribution stage when using global sub-Saharan African averages. A brief look at the Woolworths supply chain and distribution system also helped to support this notion of minimal distribution stage wastage/losses, with Woolworths reporting a total of around 1% wastage (assumed to be landfilled/disposed of and not recovered) at the distribution stage.

However, a more thorough and quantitative analysis would need to be conducted to conclude with any certainty about the wastage happening at the distribution level throughout the Western Cape and South Africa as a whole. This is especially true with regards to smaller scale distribution centres and small to medium scale enterprises (SMME's) with different levels of access to waste minimising technologies, spare capital and efficient transport systems.

4.3.5. Hotels and catering facilities and food waste

The hotel/conference/catering industries have the potential to be extremely efficient, where food waste, extras and leftovers follow a kind of "second use hierarchy": (1) staff meals; (2) donations where possible and free from liability/legal issues; (3) animal feed, composting, bio-digesting; and with absolutely no other options, (4) landfill. Landfill, however, should really not be able to be considered as an affordable/viable option. This kind of decision making and planning undoubtedly sits within local, regional and national government, but it is certainly not a simple decision. There are in fact many potential knock-on effects that could result from, for example, an outright ban or severe tax on landfilled food waste in any form. One of these includes the potential increase of illegal dumping. However, some level of regulation of the larger players in the food industry (and thus those with the potentially largest wastage) could be quite effective without risking illegal dumping. This is because these organisations would be less likely to risk potentially significant reputational, legal and financial penalties and consequences. Overall the role of government in this space is in serious need of some more specific attention, and simply allowing food waste to go into a special landfill with hazardous classification is not sufficient or desirable.

Larger and more formal facilities have a greater ability to minimise waste, however, according to an initial investigation conducted by GreenCape, many of the largest hotels across Cape Town are not yet separating and diverting their food waste from landfill. The argument used against the challenge to the industry in terms of correct food waste disposal is often around the costs involved to the company, and that diversion is more expensive and more effort than conventional disposal. However, as shown at the CTICC and the Cape Town Market, food waste separation and diversion can be done extremely easily and efficiently, and often with the potential for additional value creation. In the case of the Cape Town Market, the potential exists for off-sale agreements for their on-site compost.

4.3.6. Retail and consumer level waste

From what was observed, it is suggested that the largest potential for managing food losses, wastage and inefficiencies will likely occur during the retail and consumer stages. This is due to a number of reasons, including, but not limited to the following: possible breaks in the cold chain, bad management, lack of sufficient training, overstocking (retailers), overbuying (consumers), a lack of access to sufficient storage equipment, poor meal and stock planning, insufficient knowledge, just plain excess or simply because it is the end of the chain. This is contrary to the high-level, generalised sub-Saharan data, which says together the distribution stage (assumed to include retailers) and consumer stage contribute around 21% to the total.

4.3.7. Small scale and informal operations

What about many smaller scale and informal operations? Unfortunately this exercise was unable to adequately investigate the potential for food waste and inefficiencies at the smaller facilities, so this is certainly a key area to investigate further. According to a number of international studies (Lipinski et al., 2013; Gustavsson et al., 2011), and the few interactions that were had with smaller facilities during the Food Forward project, these smaller scale and more informal operations are usually less efficient for a number of reasons. As stated above, this can often be due to lack of sufficient access to proper transport, cold chains, storage equipment, packaging, processing facilities, infrastructure, knowledge, skills and market access etc. While this list is not exhaustive or applicable to all South African/African regions, it contributes to the understanding for why sub-Saharan Africa's statistics (from which the South African stats in figure 1 were derived) show such large wastage levels at the first three stages of the food chain.

5. SYNERGIES AND COMPANY COMMITMENTS

5.1. Key synergies/opportunities

Besides a number of company-specific improvements highlighted throughout the tours that organisations can begin to address internally, there were a number of other potential synergies and linkages between various participants and some of the activities. During the tour feedback process participants noted where they could assist or if there was a relevant synergy from their perspective. These have been listed below as part of the tour outcomes, where all necessary contacts to follow up and extend these synergies have been provided to the involved parties.

Some of the potential opportunities identified include:

- A number of organisations to provide excess produce/swell to the Genadendal swap-shop;
- Off-take/sale agreements with the Genadendal Frozen Veg facility of their broccoli dust by-product;

- Nearby organisations providing additional material for the Elgin Fruit Juice biogas digester, as well as a few potential off-take agreements for the resultant sludge fertiliser and waste wood;
- Support with the composting system on the Genadendal SMME farms, as well as potential access to additional markets;
- There was a potential link between XSIT and Y-waste, providing XSIT with microbes to assist in waste water purification and for feed composting. The XSIT solid waste by-products are currently being tested by Y-waste for potential use as compost. Due to the distance from large recycling hubs (i.e. Cape Town), it is recommended that onsite composting be done, or that XSIT implements a compost process with a local farmer. Compost sales could result in increased revenue, and employment opportunities also exist;
- In addition, researchers at the University of Cape Town (UCT) have agreed to test the leftover moth feed from the XSIT facility, in order to see if there is a way to use bacteria for breaking down the persistent red dye used in the feed. If successful, this could enable the waste feed to be fed to animals safely with no risk of colour transfer into the animal products/by-products;
- Potential synergies exist between both Stephan en Sean and ALG, and the Cape Town market, essentially providing an additional local market platform for selling excess fruit and vegetables that cannot be exported;
- The Western Cape Industrial Symbiosis Programme (WISP) can potentially provide support to a number of the visited facilities in terms of: (1) finding a prospective buyer for Eden Biofuels' excess glycerine; (2) finding additional fruit suppliers for Lakeland Foods as well as a potential taker for their plastic containers; (3) finding a use/recycling option for the waste health and safety gear across all industries; (4) finding a use or recycling outlet for the large amount of recyclable packaging and labelling waste generated at the At Source facility;
- A partner of the Kos en Fynbos initiative could potentially be able to use some of the excess glycerine from Eden Biofuels for soap making on a small scale;
- There is a potential future link for Lakeland Foods to procure dehydrated products from the Agripark for use in the process;
- There is an opportunity for Nelson Mandela Metropolitan University (NMMU) agriculture students to do practical research at the Van Greunen farms;
- There is an opportunity for the Agripark to use GreenCape's new policy and legislation support tool;
- Potential synergies exist with a few of the organisations visited for sustainability training & development, awareness campaigns for staff and stakeholders, run through Icologie;
- Opportunities exist for information and best practice sharing between CTICC and Portside, for example, transfer of food waste management system knowledge;

5.2. Individual company commitments – 110% Green flagships

One of the project's aims was also to mobilise stakeholders and get them to "COMMIT, ACT, IMPACT" by becoming a 110% Green flagship and making a measurable commitment. Although the commitments made were not specifically

related to a reduction in food waste, participating organisations made commitments along the lines of increasing overall efficiencies, creating jobs and/or expanding on the good work they are doing as part of the green economy. Organisations who signed up as 110% Green Flagships through the work of the Food Forward project include the Cape Town Market; Elgin Fruit Juice; Kos en Fynbos; Eden Biofuels; and Green Genie.

6. WAY FORWARD

6.1. Key interventions points

The key intervention points for government to pursue, which were highlighted during the Food Forward project, are summarised below:

- Small scale farmers need support to scale their operations, and in order to add additional value. Many also require training, better information and more regular market access;
- Retailers have a large role to play in steering demand and more efficient consumers, but also in terms of taking responsibility for the waste they create;
- Consumers play a very important role through their product choices and behaviour but also because this is where the chain ends and most food ends up. Logically we can assume that the correct use, planning and behavioural practices surrounding the food reaching the end of the chain (a theoretical 70% of all food production) is of utmost importance. Thus the final stage of the food chain needs significant focus;
- Food donation regulations need to be investigated – i.e. based on the US – Good Samaritan Act – in order to see if there is a potential option for something similar in South Africa;
- The need for a multi-disciplinary think-tank to bridge efficiency related issues and blockages experienced between business and government needs to be explored more thoroughly;
- There needs to be a greater effort to investigate the feasibility of additional regulations/by-laws around dumping food waste for retailers and all food handlers (hotels, caterers, restaurants etc.). Food waste needs to be diverted for donations, processing, composting etc.;
- Costs of local produce need to be competitive with international importers. Strategic support is needed to facilitate this;
- Keeping the cold chain is extremely important. Smaller producers and operation needs support in this area and better access to technologies.
- Regulations are needed to prevent companies from macerating their food waste and pumping it out with regular waste water;
- More regulation is needed in the cooking oil industry, including specific restrictions around using old/toxic oil in animal feed. Government also needs to help by funding and supporting a motion to stimulate the local biofuels market through greater taxation on used cooking oil exports;

More specifically, the various levels of government in South Africa need to step up to their varied roles and work on areas in which the biggest impact can be made to reduce food waste:

- Policies and by-laws with regards to food waste;
- Building a platform or think-tank to improve public-private interactions;
 - Bringing together its networks of businesses and organisations to:
 - Remove blockages and red tape around food chain efficiency issues
 - Help facilitate farm level wastage being diverted into agro-processing industry;
- Creating a support structure for sharing best practice in regards to SMME's all along the food supply chain;
- Communicate with the public through its various channels and help retailers, businesses and NGO's to educate the consumer.

6.2. Food waste data requirement

In addition to the above recommendations, the next steps that should be coordinated on a Provincial level need to involve the following:

- An effort to more accurately quantify the actual food waste figures throughout the entire food chain in the Western Cape, or at very least a few key commodities. This could be approached from many angles, however, the most effective strategy to obtain data would likely be the following:
 - Approaching key government Departments, municipalities and industry bodies for their support and endorsement for conducting a coordinated and official call for data relating to waste and food waste. The call would be directed at most big companies at all stages of the food chain and across all food commodities.
 - This is not likely to be a short and simple operation, but would be able to be done at fairly low cost. There are perhaps similar data collection initiatives conducted by government or externally from which lessons could be learnt.
- Once the data has been collected and analysed, it will be easier to determine the priority areas in terms of action, where specific interventions would result in the greatest reduction in food waste.
- Having this data would also provide a food waste baseline in order to monitor the effectiveness and progress of any intervention or action.

7. REFERENCES

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Lipinski, B. et al. 2013. "Reducing Food Loss and Waste." Working Paper, Installment 2 of Creating a Sustainable Food Future. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>.

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ANNEXURES

Annexure 1: Tour programmes

Theewaterkloof tour

Day	Date	Time	Activity	Location
Tuesday	26 Aug 2014	07:30	Depart CT - CT GUESTS ONLY	Cape Town
Tuesday	26 Aug 2014	09:30	Arrival in Caledon, welcome and tea/snacks at SAB - ALL	Caledon
Tuesday	26 Aug 2014	10:00	SAB process presentation and walking tour of malting plant - ALL	Caledon
Tuesday	26 Aug 2014	12:00	Swap shop visit - Mind over Matter - ALL	Genadendal
Tuesday	26 Aug 2014	13:00	Lunch at Eco schools – Greyton Eco-lodge - ALL	Greyton
Tuesday	26 Aug 2014	14:00	Chat n chill at the Eco-lodge/Greyton walk -ALL	Greyton
Tuesday	26 Aug 2014	15:00	Genadendal Small scale farmer visit - ALL	Genadendal
Tuesday	26 Aug 2014	16:30	Arrive at accommodation/check in/Self-time	Greyton
Tuesday	26 Aug 2014	18:00	Debrief/ Group activity/wine tasting - ALL	Greyton
Tuesday	26 Aug 2014	19:00	Dinner – Greyton Eco-lodge - ALL	Greyton
Wednesday	27 Aug 2014	07:00	Breakfast and checkout at respective accommodation - CT GUESTS ONLY	Greyton
Wednesday	27 Aug 2014	08:00	Depart for Genadendal from Eco-lodge – ALL	Greyton
Wednesday	27 Aug 2014	08:15	Genadendal frozen veg facility visit - ALL	Genadendal
Wednesday	27 Aug 2014	10:45	Kromco packaging facility visit – ALL	Grabouw/ Elgin
Wednesday	27 Aug 2014	12:00	Elgin Fruit Juice processing visit - ALL	Grabouw/ Elgin
Wednesday	27 Aug 2014	13:30	Lunch – Houwhoek - ALL	Grabouw/ Elgin
Wednesday	27 Aug 2014	14:30	Depart for Cape Town - CT GUESTS ONLY	Grabouw/ Elgin
Wednesday	27 Aug 2014	16:30	Arrive in Cape Town	Cape Town

Cederberg Tour

Day	Date	Time	Activity	Location
Thursday	16 Oct 2014	07:00	Depart CT - CT GUESTS ONLY	Cape Town
Thursday	16 Oct 2014	09:30	Arrival in Citrusdal, welcome ALL	Citrusdal
Thursday	16 Oct 2014	10:00	XSIT Sterile Insect technique facility visit - ALL	Citrusdal
Thursday	16 Oct 2014	11:00	Depart for ALG	Citrusdal
Thursday	16 Oct 2014	11:15	ALG citrus packhouse/juicing facility visit - ALL	Citrusdal
Thursday	16 Oct 2014	12:15	Depart for lunch	Citrusdal
Thursday	16 Oct 2014	12:30	Lunch in Citrusdal - ALL	Citrusdal
Thursday	16 Oct 2014	13:45	Leave for Aurora	Citrusdal
Thursday	16 Oct 2014	15:30	Potato farm and processing facility visit - ALL	Near Aurora
Thursday	16 Oct 2014	16:30	Leave for Clanwilliam	Near Aurora
Thursday	16 Oct 2014	18:30	Check-in at accommodation CT guests/self-time - ALL	Clanwilliam
Thursday	16 Oct 2014	19:30	Dinner in ClanWilliam - ALL	Clanwilliam
Thursday	16 Oct 2014	21:00	Local guests depart	Clanwilliam
Day 2	Date	Time	Activity	Location
Friday	17 Oct 2014	07:30	Breakfast and checkout at accommodation - CT GUESTS ONLY	Clanwilliam
Friday	17 Oct 2014	08:15	Pickup from accommodation - CT GUESTS ONLY	Clanwilliam
Friday	17 Oct 2014	08:30	Depart for Rooibos facility – ALL	Clanwilliam
Friday	17 Oct 2014	08:45	Rooibos growing and processing facility visit - ALL	Clanwilliam
Friday	17 Oct 2014	09:45	Depart for conference discussion venue	Clanwilliam
Friday	17 Oct 2014	10:00	Group discussion and debrief – ALL	Clanwilliam
Friday	17 Oct 2014	12:00	Depart for lunch	Clanwilliam
Friday	17 Oct 2014	12:15	Lunch in Clanwilliam - ALL	Clanwilliam
Friday	17 Oct 2014	13:45	Depart for Cape Town - CT GUESTS ONLY	Clanwilliam
Friday	17 Oct 2014	16:30	Arrive in Cape Town	Cape Town

George Tour

Day 1	Date	Time	Activity	Location
Wednesday	6 Nov 2014	06:30	Depart CT - CT GUESTS ONLY	Cape Town
Wednesday	6 Nov 2014	11:45	Arrival in George, welcome and Agripark tour – NMMU permaculture - ALL	George
Wednesday	6 Nov 2014	12:15	Depart for lunch	George
Wednesday	6 Nov 2014	12:30	Lunch in George – ALL	George
Wednesday	6 Nov 2014	13:30	Depart for Grootbrak	George
Wednesday	6 Nov 2014	14:00	Tour of the Dairy farm/Blueberry farm overview	Grootbrak
Wednesday	6 Nov 2014	16:00	Depart Mossel bay Industria	Grootbrak
Wednesday	6 Nov 2014	16:30	Eden Biofuels tour	Mossel Bay
Wednesday	6 Nov 2014	17:30	Depart for George	Mossel Bay
Wednesday	6 Nov 2014	18:00	Check-in at accommodation CT guests/self-time - ALL	George
Wednesday	6 Nov 2014	19:30	Dinner in George - ALL	George
Wednesday	6 Nov 2014	21:00	Local guests depart/drop-off at accommodation	George
Day 2	Date	Time	Activity	Location
Thursday	7 Nov 2014	07:00	Breakfast at respective accommodation - CT GUESTS ONLY	George
Thursday	7 Nov 2014	08:00	Depart for George Industria	George
Thursday	7 Nov 2014	08:15	Lakeland Food Company tour	George
Thursday	7 Nov 2014	09:00	Lancewood cheese factory tour	George
Thursday	7 Nov 2014	10:00	Depart for Swellendam	George
Thursday	7 Nov 2014	12:30	Lunch and Discussion in Swellendam - ALL	Swellendam
Thursday	7 Nov 2014	14:00	Depart for Cape Town	Swellendam
Thursday	7 Nov 2014	17:00	Arrive in Cape Town	Cape Town

Witzenburg Tour

Day 1	Date	Time	Activity	Location
Thurs	4 Dec 2014	06:30	Depart CT	Cape Town
Thurs	4 Dec 2014	08:30	Arrival in Willow Creek and welcome	Worcester
Thurs	4 Dec 2014	08:45	Willow Creek olive farm visit	Worcester
Thurs	4 Dec 2014	09:45	Depart for At Source	Ceres
Thurs	4 Dec 2014	11:15	At source dried fruit facility visit	Ceres
Thurs	4 Dec 2014	12:15	Depart for Ceres	Ceres
Thurs	4 Dec 2014	12:45	Lunch in Ceres- ALL	Ceres
Thurs	4 Dec 2014	13:45	Depart for Klondyke Cherry farm	Ceres
Thurs	4 Dec 2014	14:30	Klondyke Cherry farm visit	Ceres
Thurs	4 Dec 2014	15:30	Depart for Cape Town	Ceres
Thurs	4 Dec 2014	18:00	Arrive in Cape Town	Cape Town

Cape Town Tour

Day 1	Date	Time	Activity	Location
Wed	4 Feb 2015	08:30	Meet at CTICC, intro and welcome	CTICC
Wed	4 Feb 2015	09:00	Tour of CTICC's catering and food facilities	CTICC
Wed	4 Feb 2015	10:30	Walk to FNB Portside building	CTICC
Wed	4 Feb 2015	10:45	Tour of Portside canteen and restaurant	Portside
Wed	4 Feb 2015	12:30	End of day 1 activities	Portside
Day 2	Date	Time	Activity	Location
Thurs	5 Feb 2015	07:15	Meet at Mandela Rhodes Place	CT CBD
Thurs	5 Feb 2015	07:30	Travel to Cape Town Market	Epping
Thurs	5 Feb 2015	08:00	Tour of Cape Town Market and Y-Waste composting facility	Epping
Thurs	5 Feb 2015	10:00	Depart for Montague Gardens	Epping
Thurs	5 Feb 2015	10:30	Tour of Woolworths distribution centre	M. Gardens
Thurs	5 Feb 2015	12:30	End of day 2 activities - Depart for CBD	M. Gardens
Thurs	5 Feb 2015	13:00	Arrive back at Mandela Rhodes Place	CT CBD

Annexure 2: Tour participants and contacts

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