FOOD WASTE IN KENYA
UNCOVERING FOOD WASTE IN THE HORTICULTURAL EXPORT SUPPLY CHAIN

Table of Contents

Executive summary ........................................................................................................... 3

Introduction ...................................................................................................................... 6
  Methodology .................................................................................................................. 9

1.0 Causes of food waste ............................................................................................... 10
  1.1 Cosmetic specifications ......................................................................................... 10
  1.2 Order cancellations & last minute forecast adjustments ............................... 19

2.0 Solutions to food waste: opportunities and challenges ........................................ 24
  2.1 Local markets ....................................................................................................... 24
  Challenges .................................................................................................................... 24
  Opportunities .............................................................................................................. 25
  2.2 Value addition industries .................................................................................... 26
  Crisps and biscuits made from overripe bananas .................................................... 26
  French bean canning .................................................................................................... 27
  Dried mango production ............................................................................................ 27
  Opportunity: passion fruit juice .................................................................................. 28
  Challenges .................................................................................................................... 28
  2.3 Biogas ................................................................................................................... 28

3.0 Additional activity in kenya ..................................................................................... 30
  3.1 TedX nairobi .......................................................................................................... 30
  3.2 Disco soup nairobi ............................................................................................... 32

4.0 Concluding comments and recommendations ...................................................... 33
  A. Food waste reduction .............................................................................................. 33
  B. Redistribution ......................................................................................................... 36
  Further research .......................................................................................................... 37

Appendix .......................................................................................................................... 38
  1. Interview questions .................................................................................................. 38
  2. The food waste pyramid ........................................................................................ 41

References ......................................................................................................................... 42
EXECUTIVE SUMMARY

Through ongoing research into Kenya’s horticultural export supply chains, Feedback has uncovered systemic issues related to imbalances of power and unfair trading practices in agricultural supply chains that have a significant impact on food waste levels, as well as farmer livelihoods and by extension food security. Last minute alteration or cancelation of demand forecasts, unnecessarily strict cosmetic specifications and unpredictable fluctuations in demand and price from retail buyers often mean that farmers are left with large amounts of produce that they cannot sell, as secondary markets are not responsive enough or lucrative enough to absorb this produce.

We discovered that this offloading of risk is widespread in the Kenyan agricultural sector producing food for European markets and indeed in countries beyond Kenya such as Costa Rica and Ecuador. Not only do these issues result in high levels of wasted resources such as land, waste, energy, agri-chemicals and fuel; they also cause severe financial loss to exporters, farmers and farm workers. Financial risk is transferred down the supply chain to the weakest actors forcing many into debt cycles and reduced living standards.

As demand for luxury horticultural products is rapidly increasing owing to the rise of middle class populations globally, other countries in the continent are starting to gear their production towards servicing this market. As a result, the problems facing Kenya at the moment, which are endemic in the way international horticultural value chains function, could be rapidly magnified if the African horticultural market is to follow the same path as the Kenyan sector. In light of this, raising awareness of the trade practices causing this unnecessary waste among stakeholders and identifying the positive intervention points that will lead to systemic change becomes all the more important.

In this context, The Rockefeller Foundation provided funding to Feedback to conduct further research into the Kenyan horticultural supply chain in order to gain more insights into the causes of food waste and to identify positive solutions that are particularly pertinent for the Kenyan context but have the potential to be replicated across the African continent as well as globally.
The aim of the report is to provide the evidence base that will help The Rockefeller Foundation advance the global dialogue on the food waste and food security agendas and will inform its strategic thinking on the most effective leverage points along the value chain that will effect systems change. We hope that the evidence will also offer the opportunity to engage a range of stakeholders (large retailers, European institutions and the wider public) around the issues in question. The report also provides critical areas of business practice that must be addressed to put an end to unfair trading practices. Doing so will not only reduce the amount of food being wasted in fresh produce export supply chains, but it will also improve the livelihoods of many farmers across the world.

To that end, the Feedback team carried out a two-week research trip to collect further data and interview farmers, exporters and other stakeholders. 21 semi-structured interviews were conducted with farmers, exporters and day laborers, which can be found in the appendix, the results of which are analysed in this report.

Through this in-depth investigation, we have identified two major causes of waste in the Kenyan horticultural exports sector.

Firstly, cosmetic specifications imposed on exporters and farmers in Kenya, predominantly by European retailers, have led to systemic waste within the sector. Secondly, farmers and exporters complained of frequent order cancellations and last minute forecast adjustments made by their clients, resulting more often than not in large amounts of unsellable food that is either dumped or at best fed to livestock.

This report shines a light on these causes of waste whilst also identifying positive solutions to this issue being developed in Kenya. These solutions have the potential to significantly reduce waste; increase the availability of food and enhance local and global food security; increase small-holder farmer incomes and create employment opportunities locally, enhancing the wellbeing of local communities.

A number of secondary markets have been identified where surplus produce can be or is already diverted, including value addition initiatives that introduce low-cost innovative solutions that provide significant opportunities to increase on-farm income. There remain however a
number of challenges to developing these opportunities, which we have highlighted in this report.

Here, we summarise some of the key results from the interviews:

• All of the farmers and exporters interviewed for this report expressed having experienced problems with food being rejected on the grounds of cosmetic specifications.

• All farmers interviewed had experienced financial loss as a result of the rejections caused by cosmetic specifications.

• The average amount of food rejected at farm-level reported by farmers was 32.9%

• Exporters reported an average of 44.5% of produce being rejected before being exported, inclusive of farm level waste.

• Farmers reported having up to 50% of their produce rejected because of cosmetic standards or order forecast amendments.

• Farmers report being forced into cycles of debt as a result of uncompensated order cancellations

• Exporters waste 30% of French beans through the practice of ‘topping and tailing’ for cosmetic specifications
INTRODUCTION

This report focuses on Kenya as a case study to explore the issue of food waste within the developing world, and is primarily concerned with the country’s horticultural export supply chain.

Definitions: food waste and food loss

There is an evolving number of initiatives concerned with ‘food losses’ in the Global South. These initiatives generally refer to what has come to be known as ‘post-harvest’ losses (PHL), focusing on infrastructural issues, poor harvesting methods and inadequate storage of crops. This report intends to extend this discussion further to better understand food waste in developing countries, as opposed to food losses.

Food waste shall be understood by this report as any food intended for human consumption being discarded or left to spoil as a result of actions and decisions taken by stakeholders across the supply chain (farmers, brokers, exporters, importers, retailers, and consumers) and which relate to the way that the market is structured. This is separate to food loss as defined above, which is not studied within the boundaries of this report.

A recent paper published by the Copenhagen Consensus Center highlights the needs for improved infrastructure and technology to reduce PHL in the global south, and estimates that the investment would be “complementary to investments in long-term productivity growth to achieve food security”\(^1\). However, as this report will show, there is also a great need for reducing food waste that occurs independently from improvements in PHL reduction. Food waste reduction can be achieved with limited public investment, compared to PHL reduction, instead requiring innovations in business practises to avoid unfair trading practises that force farmers to waste their produce. Recommendations have been made in light of the findings later in this report.

The Kenyan horticultural export sector

Horticultural exports make up 23% of Kenya’s GDP, being the country’s greatest foreign exchange earner\(^2\). This industry directly employs 4.5 million people, whilst indirectly supporting a further 3.5 million through

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\(^1\) Rosegrant, M et al, 2015. Food Security and Nutrition Assement Paper: returns to investment in reducing postharvest food losses and increasing agricultural productivity growth. Copenhagen Consensus Center

trade and related activities\textsuperscript{3}. Fruit and vegetables are the second and third most important exports in this subsector after flowers, with French beans being the main vegetable grown\textsuperscript{4}.

Two causes of food waste have been identified in this report. The first is associated with cosmetic specifications. Such specifications detail the exact shape, size, and colour that produce should be in, and are not related to the safety or nutritional quality of the product. These specifications are created by major European retailers and result in a large amount of fresh quality food perfectly fit for human consumption either being left in fields to rot, or alternatively graded out as ‘rejects’ as they move up the supply chain.

The second cause of food waste identified by this report relates to order cancellations and last-minute forecast adjustments. These trading practices originate at the top of the supply chain, either from retailers or importers and middlemen. When an order is cancelled, exporters and farmers are often left with no other markets for their produce. Some larger exporters are able to send cancelled orders to other customers at short notice, but for the most part the produce is either dumped, or returned to the farmer. Order cancellations can occur before or after the produce has been harvested, sometimes even hours before it is due to be exported after being graded and packed in Nairobi.

These policies result in financial loss for exporters and farmers and in some cases lead to farmers and day labourers not being paid at all. Whilst some farmers are aware of order cancellations, many only experience what they believe to be produce rejections. Produce is rejected by the exporter for arbitrary reasons, when in fact the farmers have good reason to believe that their produce is being rejected simply because there is a discrepancy between the forecasted order and the actual demand for their product.

Food waste directly translates into further waste when the wider picture is taken into consideration. Land, water, seeds, labour, agro-chemicals, and fuel are all wasted if food that has been grown for consumption never reaches the mouths of people. As one agricultural expert expressed during an interview, “food wastage goes beyond just the food


components that has been thrown away...other resources and livelihoods are [also] being wasted”.

Organisational background
Feedback has been researching food waste in the Kenyan export supply chain for the past two years. This work builds upon many years’ experience of shedding light on the immense scale of food waste in every step of the supply chain and engaging stakeholders in solutions that need to be put in place to tackle the problem.

In February 2013, Feedback visited Kenya as part of the Think.Eat.Save. Initiative. During the visit Feedback sourced food that would have otherwise gone to waste from the export supply chain to be used in a dinner for 500 environment ministers and high level delegates of the Governing Council of the United Nations Environment Program. In July 2014 Feedback returned to Kenya with 11.11.11, a Belgian non-governmental organisation (NGO), to research causes of food waste on farms and in pack houses. This initial research trip gathered information and built local networks that helped shape the research conducted for this report, the product of Feedback’s third visit to Kenya in December 2014.

Feedback was a partner at The Rockefeller Foundation funded TEDx Nairobi event held on the 6th December 2014. Feedback was tasked with curating a meal sourcing food that would have otherwise gone to waste, which was then served during lunch to the event’s delegates. Feedback secured co-funding from the Barham Trust to augment The Rockefeller Foundation’s budget allocation for Feedback to continue its investigation into the causes of food waste and its solutions in Kenya.

In addition to the fulfillment of the stipulated tasks, on the 7th December Feedback participated in Africa’s debut Disco Soup event in Nairobi, a citizen-led initiative designed to bring communities together to raise awareness of food waste. Feedback supported the organisation of Disco Soup Nairobi, which brought together key industry and NGO stakeholders in Kenya including major exporters, the FAO, UNEP, WFP and social entrepreneurs in Nairobi. An investigation on the viability of introducing a charitable food redistribution system became the focus of a roundtable discussion held at the event between these stakeholders.
Methodology
This report is the product of a two-week research trip to Kenya conducted by Feedback. Primary data was gathered through informal semi-structured interviews held with farmers and exporters. Each interview was guided by a set of 24 questions, which can be found in the appendix of this report. In total 21 interviews were conducted, of which ten were with farmers, two were with day labourers and nine were with exporters.

Semi-structured informal interviews were chosen as a method of research to avoid restricting interviewees to answer questions within a strict format. Five of the interviews were conducted in Swahili and were translated in situ, while the rest were conducted in English.

Data and testimonials were taken from individuals with their prior consent. Feedback appreciates the personal and commercial sensitivity of the information included in this report and therefore the names of individuals and businesses have been omitted from this report to protect the identity of those involved.

The first week’s interviews were recorded using a Dictaphone. The second week’s interviews were conducted alongside a cameraman. Although the presence of recording equipment may have caused interviewees to not act normally, the responses given by each of the participants in different settings were very similar showing a high level of validity. Interviews were conducted on farms and in export pack houses of various sizes to ensure a high level of representativeness. The results of the interviews corresponded with results from a similar survey conducted previously by Feedback in Kenya, therefore demonstrating a high level of reliability.

Another difference in data collection that should be noted is the difference in produce handled by the farmers and exporters. The farmers interviewed for this report dealt primarily with French beans, sugar snaps and mange tout. The exporters interviewed dealt with a much wider variety of produce including peppers, baby corn, broccoli, baby carrots, chillis, avocados, mangos, and passion fruit as well as the above.

Secondary data was gathered via desktop research and communications with industry experts in Kenya.
1.0 CAUSES OF FOOD WASTE

1.1 Cosmetic specifications

“Every week I harvest between 300 and 500kg depending on how much I’ve planted. Out of this harvest I end up losing about 200kg. I feel very bad because I’m losing...I have people working in the farm. I pay each of them 300 shillings per day. This is wasted, that is money that is lost and I feel so bad because I am losing money.” – Kenyan French Bean Farmer

- 100% of the farmers and exporters interviewed expressed having experienced problems with food being rejected on the grounds of cosmetic specifications.

- 100% of the farmers interviewed had experienced financial loss as a result of the rejections caused by cosmetic specifications.

- The average amount of food rejected at farm-level reported by farmers was 36.25%.

- The average amount of food rejected at pack house level reported by exporters was 25%.

- Exporters waste 30% of French beans through the practice of ‘topping and tailing’ for cosmetic specifications.

- 100% of the farmers and exporters interviewed believed that rejections were the result of actions taken by European importers and retailers.

- Farmers and exporters were able to identify trends in levels of rejects throughout the year, relating to seasonality and market demand.
Cosmetic specifications are a challenge for many farmers across the world. Whilst specifications concerning food safety and quality are understandable, unnecessarily strict cosmetic specifications lead to food being graded upon its appearance rather than nutritional content. As such, these specifications generate a substantial amount of unnecessary and avoidable waste, as food deemed ‘unsellable’ is largely wasted or alternatively fed to livestock.

Cosmetic specifications are a major problem for both exporters and farmers in Kenya. Produce that does not meet these standards is simply ‘rejected’ from the supply chain resulting in financial loss for the businesses involved. Every farmer and exporter interviewed expressed having regularly experienced problems with produce being rejected on the grounds of cosmetic specifications. Yet, the majority of the exporters and farmers interviewed claimed that they did not understand the reason for these specifications.

One farmer noted “I understand that Mange Tout means ‘eat everything', but I now I'm wondering: why don't you eat everything as the name means?” Two individuals reported that they had been told that the cosmetic specifications related to the nutritional content of the produce. However, they had not received any evidence of this, nor could they see any logic in the statement.

Farmers reported having to reject produce on the farm and in their grading shed in order to meet the demands of the exporters. However they also claimed that food was regularly rejected at the exporter's pack house after they had graded it themselves. In some cases, food rejected at the pack house was returned to the farm to either be used as cattle feed or compost.

Farmers and exporters are sometimes able to sell produce on the local market. However, produce that has been grown for the export market attracts a very low price on the local market, sometimes 7-15% of the expected value. For some businesses, it is not worth selling this produce considering the additional costs of transportation and marketing. As the market is already saturated with products grown for the local market there is no major demand for produce intended for export. Furthermore, products like mange tout, sugar snap peas, and French beans are not regarded as culturally appropriate food in Kenya. These products are seen as foods grown solely for export and are not generally eaten by the local population due a difference in local palettes.
Exporters reported that different markets had different levels of tolerance when it came to cosmetic specifications. They explained that the Middle Eastern market was not as strict as the European market. Of the European importers, the UK was identified as being the strictest when it came to horticultural produce, followed by France. This reputation had led two exporters that were interviewed to stop all business with the UK as they felt their clients were too fussy.

Rejects exist across the supply chain in Kenya from farm to pack house. The process of sorting ‘exportable’ produce from ‘rejects’, known as grading, occurs at three levels in Kenya: on the field, in farm grading sheds and in exporter pack houses.

**Field rejections**
Farm workers are trained to only pick sellable produce from the farm. Produce that does not meet specifications is left on the plants or the ground.

The average amount of food being wasted at this level reported by farmers interviewed by Feedback was 14%. This food would typically be left in the field and ploughed back into the earth.

**Grading-shed rejections**
As workers are paid for either the time they spend harvesting or the quantity of produce they pick, the level of on-farm grading is not effective and therefore further sorting is required separately from the field. This produce is taken to grading sheds, either on farm or to a local facility owned by a farming cooperative. A team of trained workers then sort through the harvested produce to ensure only ‘grade 1’ produce is sent to the exporter.

A farmer growing snow peas for the export market described how he felt when he had to reject his own produce after it had been harvested:

“I feel very bad because I’ve put in all my energy to grow this food. We’ve put in the labour, we end up harvesting and taking it to the grading shed. Then we discover that there is a lot that can’t go to the company. What is more important is the losses we incur, because we did not grow this food for eating, we grew it to make money out of it.”
The average amount of waste generated at this level reported by farmers was 22%. This food would either be fed to livestock, or instead used for compost due to the sheer quantity available. One farmer reported how he regularly dumped his produce because there was too much even for his cattle to eat.

Combining this figure with the previous farm level rejects (14%), an average 32.92% of crops grown for export were reported to have been rejected before being sent to the pack house because of cosmetic specifications.

Field level rejects \rightarrow Grading shed rejects \rightarrow Exporter

14% \rightarrow 22%

Percentage of rejects occurring at farm level reported by farmers

Total percentage of produce rejected = 32.92%
Baby corn rejected for being (L-R) too long; too thick; too small; too thick; too long; too long.

Crates of rejected produce waiting to be collected for dumping back at the farm.
Pack house rejections

An additional level of grading is required once the produce has arrived at the exporter’s pack house to ensure against produce being rejected on arrival in the country it is destined for.

Some pack-houses operate using standard packability percentages (SPP) to provide estimates of how much produce they need to procure in order to meet their client’s orders. These SPPs inform the minimum amount of exportable produce that must be delivered per consignment from the farm. One exporter visited by Feedback had an SPP of 50% for baby carrots – a figure that meant the exporter expected to waste 50% of the carrots delivered due to cosmetic standards.

At one pack house visited by Feedback, farmers were required to deliver French beans that on first inspection are at least 65% packable. An SPP of 65%, at this particular exporter meant that the farmer would be paid in full for their produce. Farmers delivering between 50 and 65% SPP would receive the gross payment minus 10%. Any consignments delivered with an SPP below 50% are subject to market demand. If there is demand for the product then the farmer will be paid according to packability.

This is not the case for all pack houses however and many exporters will only pay for what they are able to export. The rest of the food is rejected, in turn being sent back to the farm to be fed to livestock and composted; sold in small quantities on the local market; or dumped.

In this situation the farmer, having lost their source of income, is unable to pay their workers in full. To avoid creating animosity between the farm and its labourers, many farmers resort to taking out loans or selling their livestock in order to pay their workers. One farmer interviewed said the following about food being rejected once it had arrived at the pack house:

“Sometimes you have taken some loans from the bank, sometimes we are financed by the bank, because it is very hard to start a project with no money, so you go tell the bank give me money. But when they reject what you farm, you have taken to them the produce. The bank don’t know that, so the bank will now come for the securities you have given, maybe your household goods are gone, something else you have not planned for, but all the money that you had been given by the bank went to the shamba5, to the garden or to the farm, but the company’s not interested. So they don’t care where you get the

5 * Shamba is Kiswahili for farm.

15
money. So in the long run, the farmer has double losses, one from the farm, the other for the security, is gone to the bank, so they become desperate, they become even more poor.”

Exporters interviewed by Feedback reported rejecting an average of 25% of their produce during grading in the export pack house. The same exporters noted that on average their farms would waste 26% of their crops as a result of on-farm grading prior to delivery to the pack house.

This figure is lower than that given above by the farmers interviewed, however it is important to note the exporters and farmers interviewed were not part of the same supply chain.

Exporters reported that an average of 44.5% of produce was rejected between the farms and pack houses before exporting as a result of cosmetic specifications. This figures relates to a wider variety of produce than the figure given by the farmers.

Total percentage of produce rejected = 44.52%
**Additional processing waste: ‘topping and tailing’**
The practice of ‘topping and tailing’ French beans, in order for them to fit uniformly into the packaging used by retailers, results in an average wastage of 30-40% (this level of waste is separate to the previous figures given for pack house level rejections). To ensure that the beans will fit into the packaging once they have been trimmed the farmer must grow a variety that produces extra long beans. The longer the bean is, the more that is wasted by topping and tailing. The trimmed ends are not suitable for the local market so are routinely fed to cattle or dumped.

One exporter interviewed by Feedback described this practice as ‘totally ridiculous’ and wished that it would be ended. The exporter welcomed the idea of selling misshapen beans, alongside selling more high care products which would reduce the amount of waste generated by rejects.

Feedback previously challenged Tesco to stop the practice of topping and tailing French beans. As a result Tesco changed their buying policy, instead opting for just topped beans. In the process of researching for this report, an exporter was interviewed who supplies Tesco and therefore had become a beneficiary of this change in purchasing policy. She said:

“When we were doing the top and tail we were basing our yield calculations on 67%. This means that out of what was delivered here... we would provide for 33% waste just from top and tailing... When our customer made the switch from cutting both sides of the bean...the yield is 77%.”
The exporter, now only having to trim one end of the bean, had reduced their waste by a third. This reduction led to annual savings of seven million shillings (approximately £50,000). This saving also had a knock-on effect for farmers. As the exporter paid their farmer per packability, the farmer could expect a higher price as more of their produce was being exported. Since this initial challenge, at least three major retailers are now only trimming one end of their French Beans rather than both. Feedback is calling for all European supermarkets to go one step further and purchase whole beans only to stop this gratuitous waste.

Another exporter was asked how a relaxation in cosmetic specifications would affect his business. He said:

“...that would increase the pack out - we would not lose as much. We would be able to ship more and lose less, which could mean we could have better prices. That would mean more to us and to the farmers. We could even grow less.“

There are therefore two outcomes to reducing, or abolishing, cosmetic specifications. Firstly the exporter and the farmer will be able to sell more food, therefore wasting less. Secondly however, and more importantly, it means that farmers' costs would be reduced as they would not need to grow excessive quantities of produce to insure against produce not meeting the specifications. Growing less produce also means using less land, water and agrochemicals, therefore reducing the amount of strain placed upon natural resources as well as farmers' budgets.

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6 It is important to note that the practice of removing the stalk before transportation would reduce weight and therefore transportation costs. Removing the stalk, something that is not consumed, should not be considered food waste.
1.2 Order cancellations & last minute forecast adjustments

“Just imagine you have been waiting for pay for about fifty days... imagine when the order is cancelled at the last moment. As a human being, how do you feel?

You feel so discouraged; you have debt from other people who have been working for you... after all that, I tell them I don't have money to pay them. So you are going to create, I don't know what to call it - enmity between your workers, loss of confidence - you cannot tell them to work anymore, you see?

You are also going to have financial loss, heavy ones, and mental torture. Psychologically, you feel somebody has done something bad to you, and yet you cannot reach to him, you cannot even use a lawyer because you have nothing to claim here.”

- Kenyan French Bean Farmer

- Farmers who had experienced order cancellations and amendments reported losses of up to 100%.

- One farmer interviewed expressed having orders cancelled two to three times a month.

- Farmers, having suffered losses due to order cancellations, routinely resorted to loans in order to cover their costs entering them into cycles of debt.

- Farmers claimed that orders rejections, based on the grounds of quality and cosmetic specifications, were used by exporters and importers to hide order cancellations and amendments.

- 100% of farmers interviewed would not take legal action against their buyers for fear of losing business.

- Farmers report being forced into cycles of debt as a result of uncompensated order cancellations.
Whereas cosmetic specifications generate relatively regular patterns of waste in Kenya's export supply chain, order cancellations and last minute forecast adjustments result in unpredictable levels of waste, leaving farmers and exporters more vulnerable to income volatility. The severity of these losses range from slight reductions in forecast orders to entire order cancellations.

It is important to understand the processes that give rise to these unfair trading practices, and to recognize the relative power holders whose actions result in waste and financial loss. Our research has revealed that the role of middlemen that sit between UK and European retailers and their suppliers in Kenya is unclear when it comes to their responsibility in creating the patterns of waste described above. This suggests that more research needs to be done to understand the complexities of overseas supply chains.

Farmers work to growing programs given to them by exporters who in turn receive them from their clients, i.e. importers and retailers. At the beginning of the growing program farmers predict the amount of produce that they must harvest to meet the orders forecasted by the client. Farmers use forecast orders to calculate the inputs and labour they will require for production, therefore giving them a guideline of costs for the growing program.

Once the growing program has been initiated the overseas client will issue weekly or monthly order programs to the exporters stating the exact quantity of produce that they wish to be consigned. The quantity of produce listed on order programs is invariably different from the expected quantities forecasted in the growing program. On receipt of the order programs the exporter is able to tell the farmer how much to
harvest so that they are able to amend their predicted labour costs before. The farmers’ costs may however increase as a result of having initially overplanted to meet the expected orders suggested in the growing program.

Order cancellations and adjustments arise after the final order program has been issued. In many cases the amendments occur during the harvest or indeed after the produce has been harvested, graded and transported to the packing house in Nairobi. A farmer growing snow peas (mange tout) spoke of how these late amendments affected him and his family financially:

“We, as farmers, have gone through this challenge before where the exporter comes to us and tells us that the market across has cancelled the orders. By that time you have harvested, and what happens therefore is that we have much of our produce left behind and yet we have already had losses in terms of operational costs.

When an order is cancelled we have a problem as a family. I have children in school who are depending on this money, who are being sent home for fees. They come here crying and by that time I’m helpless because the order has been cancelled, my produce is with me, I have casual labour, I have people in the family, and other obligations.

Once in a while I borrow money from financial institutions - they are also on my neck... I’m subjected to all of this just because of an order cancellation that is not my fault.”

Each of the farmers interviewed who had experienced order cancellations or last minute adjustments claimed to have had to seek financial assistance either through loan companies and banks or informally through other members of the community. One farmer growing French beans reported losses of 30,000 Kenyan shillings when orders were cancelled resulting in him not being able to service his loans on time causing him to fall into a cycle of debt.

Every farmer interviewed claimed to prioritise paying their workers over taking money themselves to ensure that people would work for them in the future. As a result farmers and their families suffered and in some cases were unable to send their children to school or put food on their
tables. Some farmers reported having to sell their livestock and other assets when orders were cancelled.

Where farms and exporters were vertically integrated with European importers, as was the case with one major exporter interviewed, order cancellations did not arise due to the nature of effective communications within the business supply chain. Two independent farmers claimed to have never experienced order cancellations. However they believed that high levels of rejections were often a cover up for order cancellations further up the supply chain.

**Fraudulent behavior**

Whilst most of the interviewees highlighted concrete experiences of order cancellations arising from European importers, a number of exporters and farmers claimed that order rejections, made on the grounds of quality or cosmetic specifications, were used to cover up order cancellations. In particular, there was an air of mistrust amongst some farmers towards their exporters who they believed were rejecting perfectly exportable produce because of low demand or order amendments from their importers.

Two farmers reported that although the contract they had with their exporters meant all of their harvested produce would be collected, they would regularly have large quantities of their produce dumped back at their farm or simply rejected in the pack house for not meeting arbitrary specifications. These farmers prided themselves on their grading practices and aimed to supply only beans that would meet specifications to the exporters. However, large quantities, sometimes up to 50%, were rejected from each farms’ delivery. These farmers complained that arbitrary reasons were given for rejections of their produce when in fact there was nothing wrong with it. As one farmer explained,

“if there was rust on a specific block, it would completely destroy that block. You would need in fact to remove it so that you don’t affect your other blocks... [yet] within a matter of a few days, same field and they would take only 10kg rejects, and the other one was 70kg. [The reason on the first was] pest damage, and on [the second reject sheet] there was no pest damage, there was wind scarring... if there was pest damage on [the first] there should be pest damage [on the second] because it's the same block.”
On this particular farm a pile of rejected French beans were observed that had been contaminated with tender stem broccoli – a product the farmer has never grown. In his words, “...some of this produce cannot be ours, purely because you get all sorts of weird stuff in it that we do not grow.”

The same two farmers reported an inverse correlation between the quality of their produce and the levels of rejections they received from their exporters at different times of the year. When the farmers expected to have high levels of rejects, due to bad weather, they experienced very low levels of rejections from the exporters. When conditions were good, rejects were much higher. The farmers speculated that the rejections that occurred during their peak season (a similar season to Europe's peak season) related to an increase in global supply and therefore a reduction in demand for Kenyan produce. Where an order was reduced or cancelled by an importer, the exporter would transfer the financial risk down to the farm under the pretense of cosmetic and quality control.

Despite these injustices farmers are “suffering in silence” as one agricultural expert interviewed by Feedback described, choosing to avoid confrontation with exporters over the issues causing waste for fear of losing business. Rather than engaging with exporters or taking legal action to pursue compensation, many farmers preferred to put up with the issues despite experiencing reduced living standards. A similar comment was made by exporters who feared losing business with importers and retailers in Europe. Instead they preferred to shoulder the financial costs incurred, with many transferring this risk down the supply chain to farmers.

Exporters aired an additional concern reporting that importers would regularly ‘reject’ produce a number of days after it had arrived in the country of destination. Importers would reject partial or entire consignments on the grounds of damage or poor cosmetic standard without giving adequate evidence. As the produce had been waiting with the importer for a number of days the exporters believed that what was being rejected was actually the result of a slump in demand leading to wasted food in the hands of the importer. In some cases the exporter would have already paid their farmers so they would incur a loss, whilst in other situations the exporter would transfer the financial risk to their farmers by cancelling payment.
2.0 SOLUTIONS TO FOOD WASTE: OPPORTUNITIES AND CHALLENGES

2.1 Local Markets

Challenges
Some exporters and farmers are able to sell food rejected from the export market at local markets. However, both farmers and exporters expressed a number of challenges currently reducing the amount they could sell or indeed stopping them from selling surplus produce to local markets all together:

Price
The price available for produce to be sold at the local market is significantly lower than what an exporter or farmer might expect to gain from the export supply chain. In some cases, where exporters might usually sell their produce at 70 shillings per kilo, they can only expect between 5 – 15 shillings per kilo at the local market. Such prices soon become unviable when additional costs are considered for sorting, transporting and selling this food locally.

Instead, it sometimes proves easier to dump the food, have it collected for cattle feed, or alternatively have it returned to the farm. Some farmers claimed that they sometimes find brokers who will take rejected or unsold produce for ‘throw-away’ prices:
“The people who come here are brokers...[they] come and tell us, ‘do you want us to help you? Sell to us these beans at 10 shillings per kilo.’ 10 shillings per kilo - you cannot even have a picker who will get 10 shillings to pick that. But because they have already been picked, you just give it to them at a very throwaway price, so that you can pay the pickers because you don't have any other money to pay.”

**Scale**
Farmers regularly reported that they found it very difficult to sell rejected produce on the local market because of the sheer quantities of single crops they were producing for the export market. Indeed, these family-run farms could not handle the produce themselves and in some cases were unable to feed all of the rejects to their cattle.

**Demand**
A final challenge with the local market is related to cultural perceptions of particular foods. For example, French beans, sugar snaps and snow peas are all generally considered ‘European food’. Each of the farmers and exporters we interviewed told us that this food was ‘not Kenyan’ so there was no local market available.

**Opportunities**
These challenges do present opportunities, primarily in creating awareness of how to prepare produce that is not usually eaten by Kenyans and also by fostering a local demand for such products. In a country where 1.5 million people are expected to need food assistance in the early part of 2015\(^7\) the redistribution of food that is currently being wasted should be a major priority in Kenya.

However, this should not be seen as a solution to the problem of waste relating to produce grown for the export market. In line with the food was pyramid (see appendix 2.) solutions should be found to reducing this level of food waste. Responsibility for such solutions lies with those whose actions result in waste, namely European supermarkets and importers, and to some extent Kenyan exporters.

Retailers should take responsibility for waste in their overseas supply chains. This has already begun to happen as a result of Feedback's campaigning efforts. For example, Tesco have committed to

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guaranteeing whole crop purchasing from their banana suppliers at a target of 96%. This removes the incentive for retailers to offload the financial risk of waste onto their suppliers and instead incentives them to forecast more accurately to avoid overproduction.

Importers should be held responsible for fraudulent behaviour relating to false rejection claims and order cancellations. Increased transparency throughout the supply chain would incentivise accurate forecasting on behalf of these businesses, and would ensure that importers were not able to cancel orders at the last minute in favour of cheaper produce from suppliers in other regions of the world.

2.2 Value addition industries

Crisps and biscuits made from overripe bananas

The Kenyuni Women Project (sic) produce crisps and biscuits from overripe bananas. Both of these final products give additional value to the primary product that is usually sold. Whereas one banana might be sold for five Kenyan Shillings, the same banana can be processed to produce one packet of crisps, which can be sold for four times the price. Alternatively, one banana can be processed with other ingredients to make three packets of biscuits and then sold at a price of 10 Kenyan Shillings.

The end products resulting from this project have a shelf life of over a year. Therefore not only does this system reduce any potential wastage arising from overripe bananas that cannot otherwise be sold, but it also provides a non-perishable product that can be sold over a period of time.
This stability, coupled with the higher prices the products attract, has increased the overall livelihoods of those involved with the project.

**French bean canning**

Farmers and exporters of French beans expressed an interest in sending their surplus beans to a value addition processor. Many of these businesses had been told previously that French bean canning required particular varieties of French beans, and so there surplus produce could not be used. However, a manufacturer of canned French bean products argued that this was not the case. He suggested that any type of French bean could be canned and that he would be happy to procure his beans from surpluses arising from the export supply chain.

The major issue identified by the manufacturer of canned beans was that there was very low demand for canned produce such as French beans in Kenya. Furthermore, there is no demand for such produce from the export market. As such this particular manufacturer only bought fresh French beans 2 or 3 times a year for production.

If the local market was expanded, for canned French beans, or an export market developed, then there is potential for surplus French beans to be sold at a nominal rate to manufacturers.

**Dried mango production**

The mango drying facility below makes use of solar energy to extend the shelf life of surplus mangoes. The dried mango can then be sold on with added value. As with the banana crisps and biscuits mentioned above, this small industry provides extra jobs for the local community and makes use of produce that would have otherwise gone to waste because of gluts or slumps in demand.

*Solar drying facility for processing surplus mangoes*
Opportunity: Passion fruit juice

Feedback met with a passion fruit and flower growing business that exports directly to a European retailer. They claimed to be wasting as many passion fruits as they were able to export every week. There are two reasons for the waste: firstly the demand from the retailer is currently low, and secondly the retailer rejects passion fruit in line with their cosmetic standards.

At present the business exports some of their passion fruit, sells some to a local juice making company, and dumps the rest. The director of the business told Feedback that he wished to invest in a pulping machine and a freezing unit. His plan with these pieces of equipment is to pulp 100% of the passion fruit that he grows into a puree that he can freeze. In turn this puree can be stored for longer than the primary product and sold direct to the juice making company at a higher price.

Whilst this enterprise is not up and running at present it provides another example of how waste can be avoided through innovation. Such ideas extend the shelf life of produce that otherwise could become rotten quickly, and also provide additional income for businesses.

Challenges

A number of farmers and exporters reported that many of the manufacturers processing value added products had their own vertically integrated supply chains. As such, many of these companies have very little demand for externally sourced produce.

Furthermore, farms within these supply chains grow particular varieties of produce to suit their needs for their processing methods, for example juicing, canning, drying etc. Therefore, a mango that might suit being exported well may not be particularly good for juicing, and so value adding manufacturers would not be interested in procuring surplus (rejected) produce from the export supply chain.

2.3 Biogas

Vegpro, a major Kenyan horticultural exporter, have recently invested in an on-site biogas plant to produce electricity and compost from their operational waste. The plant is expected to process 45,000 tonnes of waste a year. Half of the electricity generated will be used to take Vegpro’s farms ‘off-grid’, whilst the rest will be sold to the national grid.
During an interview with Feedback, Vegpro clearly stated that only inedible organic matter is used to feed the biogas plant. Crop residues form the main input for this facility, which come directly from the farm. In addition, processing waste such as husks from baby corn is used in order to divert this waste from landfill.

Vegpro’s food management model mirrors Feedback’s food waste pyramid (see below, or for the full version see appendix 2.) by diverting all edible food to local children’s schools, before sending diseased and rotten food to the biomass plant. Whilst Feedback promote the use of anaerobic digestion as an alternative to landfill, it is of paramount importance to recognize this form of waste management as a last resort after exhausting all methods of reduction and redistribution of surplus food.

The Food Waste Pyramid - a full version can be found in appendix 2.
3.0 ADDITIONAL ACTIVITY IN KENYA

3.1 TEDx Nairobi
Feedback received funding from The Rockefeller Foundation to conduct an event to raise awareness of the issue of food waste and losses utilizing surplus food from Kenya's export supply chain, that would otherwise gone to waste. The event featured a banquet dinner served at TEDx Nairobi. The Feedback team gathered a wide variety of surplus food from East Africa Growers Association, one of Kenya's leading exporters of horticultural produce, which was then delivered to The River Café in Nairobi to be prepared for the dinner. The food collected was an example of the type of waste generated because of cosmetic specifications and order cancellations and adjustments.

In the process of collecting surplus food, Feedback identified excessive quantities of French beans and sugar snap peas that were to be dumped from an export pack house. Feedback arranged for this food to be collected by a local school to be used in healthy meals for the pupils.
Tristram Stuart, founder of Feedback, also presented a talk during the event highlighting the global problem of food waste, with specific reference to Feedback’s work in Kenya.
3.2 Disco Soup Nairobi

The first African Disco Soup (Disco Supu) was held in Nairobi on the 7th December. Disco Soup is a global movement of events that are organised as a means of raising awareness of the issue of food waste. Guests of the event come together to prepare and cook surplus food that would have gone to waste all to the sound of DJs and musicians.

Disco Soup Nairobi was organised by local individuals with the support of Feedback. 500kg of food was saved from going to waste, donated by East African Growers Association, a major Kenyan exporter. Food was prepared and cooked by those who attended the event, with all surplus food being donated to a local school and directly to children living on the street.

The event was attended by representatives from the World Food Program, United Nations Environmental Program, and the Food and Agricultural Organization. A roundtable discussion was held between these individuals and Feedback focusing on the viability of introducing a charitable food redistribution system within Kenya.

Disco Soup Nairobi generated a great deal of popular interest amongst people living in Nairobi and the organisers have since begun planning more activities in the city to raise awareness of food waste. More information can be found online at:

www.facebook.com/discosoupnrb
4.0 CONCLUDING COMMENTS AND RECOMMENDATIONS

Through ongoing research into Kenya’s horticultural export supply chains, Feedback has uncovered systemic issues related to imbalances of power and unfair trading practices in agricultural supply chains that have a significant impact on food waste levels, as well as farmer livelihoods and by extension food security. This report has shown clear examples where actions taken by stakeholders within export supply chains lead to high levels of waste – in some cases up to 50% of the produce grown for the export market.

Two causes of waste have been identified by our research: cosmetic specifications and order cancellations. Not only do these practices have substantial negative impacts on the local environment and food security of rural communities but they also result in significant financial losses for exporters, farmers and in some cases farm day labourers. This level of financial loss often forces farmers into cycles of debt and prevents them from covering basic needs like purchasing food and paying for school fees, and therefore has a direct negative impact on the wellbeing of local communities.

Two areas of recommendations addressing solutions to food waste have emerged from this report: food waste reduction, and food redistribution.

a. Food waste reduction

Measures to avoid food waste should always be at the heart of any intervention or wider strategy aiming to tackle the problem. This report has identified that food waste in the Kenyan horticultural export sector is being caused to a large extent by systemic issues related to the patterns of behavior and actions of stakeholders in these supply chains and should therefore be tackled from these root causes. These actions primarily originate from the top of the supply chain, i.e. European retailers and importers, and are an expression of the imbalances of power that dominate these supply chains. It is therefore at this level that most of the opportunities for interventions lie, which can have achieve significant and measurable reductions in food waste, reinforce the livelihoods of local farmers and improve access to food where it is needed most.

European retailers have a great deal of leverage and control over their supply chains and therefore have the opportunity to adopt a proactive
role in changing wasteful patterns of behaviour in their relationships with direct and indirect suppliers. This report concludes with the following two recommendations with regards to retailer action:

- **Relaxation of cosmetic specifications.**

  Retailers should relax unnecessarily strict cosmetic specifications, and ideally gradually abolish these standards in due course, to allow farmers to sell a larger percentage of the produce grown for export markets which would in turn reduce the need to systematically overproduce in order to ensure there is a sufficient buffer to meet order quantities. The examples given of Tesco changing its French bean trimming policy demonstrates the relative ease in which small changes in the buying policies of such retailers can have huge impacts on farmers and exporters. Cosmetically imperfect produce can be sold as grade two produce, or used in added value and processed food production lines.

- **Improving forecasting accuracy and spreading the risks of demand fluctuations**

  It is important for retailers to work directly with their suppliers to ensure that farmers are not disproportionately affected by fluctuations in demand for certain products. This could be ensured for example by improving forecasting methods and models to increase accuracy with the direct input of their suppliers; changing the structure of their supply chains (for example by creating a more direct relationship with primary farmers); guaranteeing the purchase of a certain percentage of their suppliers crop or fully compensating their suppliers for last minute order adjustments; and helping their farmers access local or secondary markets for their excess produce either by relationship brokering or by investing in relatively low cost initiatives that can extend the ‘shelf life’ and add value to the rejected produce by repurposing it.

  There are examples of existing initiatives by UK retailers who have already taken positive steps to this direction (as has been demonstrated by the Tesco banana example). Such interventions are easily replicable and their replication should be encourages as they have immediate and significant gains in terms of food waste
reduction and improving the efficiency and fairness of retail supply chains.

Where voluntary commitments are not upheld, legislation in British law states that UK supermarkets should compensate direct suppliers in cases of order forecast amendments or cancellations (Groceries Supply Code of Practice; Section 10)\(^8\). The practice of order cancellations and amendments are therefore illegal under British law and the British Government should be investing time and resources into investigating potential breaches of this legislation. As the Groceries Supply Code of Practice does not currently protect indirect suppliers more research should be considered into the relationships between supermarkets and their direct suppliers who procure food from other countries.

When interviewing farmers and exporters, Feedback found that not a single person had heard of the Groceries Supply Code of Practice or the Adjudicator. Information about this regulatory body should be shared with the various stakeholders in Kenya’s horticultural industry to increase awareness of this office.

Two further recommendations regarding food waste reduction relate to the development of local markets for products currently grown solely for the export market:

- **Development of local market for horticultural products usually grown for export.**

  There is scope to increase local demand in Kenya for products that currently grown for the export market only. Farmers and exporters interviewed for this report both expressed a desire to be able to sell their rejected yet good quality produce to both the export and local markets. However, they identified a lack of demand in both of these markets as a challenge to selling their food outside of the conventional export supply chains.

- **Development of domestic value addition processing industry.**

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There are a number of produce types that form part of the typical Kenyan diet that are currently rejected with no secondary market to be sold to. This report has identified a range of different initiatives that not only add value to such produce but also extend the shelf life of otherwise quickly perishable foodstuffs. Processing produce via the methods suggested in this report not only reduces waste but also generates greater incomes for people involved in the industry.

b. Redistribution

In a country where millions of people are without adequate food and nutrition, infrastructure should be put in place to ensure surplus food is redistributed to those who need it.

Small quantities of food are currently given to schools, children’s homes, street children centres and medical centres around Nairobi from the export industry. However, there are infrastructural challenges blocking a) more food being redistributed and b) food being redistributed outside of Nairobi in the rural areas of Kenya. Farmers and exporters claimed that it was generally not economically viable for them to redistribute food themselves due to the cost of labour and transportation.

Centralised collection or redistribution points may provide a solution for this problem, streamlining the process of delivering large quantities of produce to numerous social organisations. Exporters interviewed by Feedback showed enthusiasm towards the idea of an independent redistribution system if it could overcome the aforementioned challenges. The majority of the exporters are based around the airport, either in private warehouses; in government-run pack houses such as the Horticultural Crop Development Authority (HCDA); or within export processing zones (EPZs). Establishing a redistribution network within this export area would provide a centralised location for surplus food to be collected at low cost.

A conversation has begun between various international organisations (including the FAO, WFP and UNEP) in Kenya as a result of Disco Soup Nairobi, looking at exploring the idea of establishing a national food redistribution scheme. Feedback recommend that this discussion should be facilitated in Nairobi in order to bring together the various stakeholders such a system would involve (exporters, recipients, NGOs and relevant international organisations). Further research should be conducted in this field to understand how such a scheme could operate
without affecting local markets. Logistics present a further challenge to such a scheme, especially as the produce in question is highly perishable and may not survive long distance journeys if not refrigerated.

It is important to note that, in line with the food waste pyramid, avoidance and reduction should be the principle goal of any initiative addressing food waste. There is no doubt that the redistribution of surplus food has a number of substantial yet short term social benefits. Ultimately, the overproduction of food leading to high levels of food waste must be stemmed in order to provide longer-term social, environmental and economic development globally.

**Further Research**

The global food economy is a convoluted system with a number of stakeholders existing at various levels in different countries within each supply chain. As such, there is an opportunity for further research to be conducted in the international supply chains of businesses in a number of countries both in Africa and beyond.

Findings from these investigations should be shared with government, policy makers and retailers to highlight the scale of the social and environmental impacts it causes to engage these businesses in effecting change with regards to unfair trading practices.
APPENDIX

1. Interview questions

The following questions were used as the basis for semi-structured interviews carried out during site visits to farmers, packing warehouses and exporters of horticultural produce in Kenyan.

1. Can you briefly describe your company/organisation: what does it do and what role does it play in the food supply chain? Roughly what size of operation (acreage/tonnage per year/product type)

2. What sector does your business cater for? What proportion of your produce is for export, and how much for local markets?

3. Is this changing over time?

4. Do you experience the problem of produce being rejected, unsold, wasted or spoiled with the crops that you grow or handle?

5. Do you believe that the waste or losses you experience are the result of actions taken by buyers?

6. To what extent do you experience economic loss as a result of quality standards applied by your clients?

   a. Are these standards communicated to you verbally or in documents?

7. Do you think that there is scope to relax these standards to increase the proportion of your crops that reach the market?

8. To what extent do you experience economic loss as a result of order cancellations and/or inaccurate forecasting applied by your clients?

   a. Are these standards communicated to you verbally or in documents?

9. Do these economic losses translate to complete wastage of food or do you have access to secondary markets?

10. Do you believe the forecast orders are provided to your “in good faith and with due care”?
11. Are you able to quantify levels of waste as a percentage of your business's overall harvest/handling?

   a) Due to total outgrades between farm to final sale combined
   b) From rejects for failing to meet quality standards
   c) From forecast inaccuracies
   d) Do you have reason to believe that buyers sometimes reject produce on the grounds of failure to meet quality standards but in reality it is because they no longer want the product because

12. Do you think that ultimately the overseas (European) buyer – the final customer – has a role in creating this problem, and do you think there are measures and policies European buyers could introduce to reduce this problem.

13. What are the best practices you are aware of in this respect in the market? Do some buyers have better policies than others?

14. Can you identify any trends in food waste, for example seasonality or product types?

15. Are you ever been asked to report on levels of food waste and spoilage by your clients?

16. Have you ever received compensation for rejected/cancelled orders?

17. Have you every asked for compensation for rejected/cancelled orders?

18. Have you taken measures to develop secondary markets for your unsold products grown for export e.g. accessing local markets, processing & drying?

19. What barriers have you experienced to maximising the role of these secondary markets? Are there examples of successful best practice that you are aware of in this respect?

20. Have you ever received support to access secondary markets with your produce? Are there any challenges to such action?
21. Have you heard of the GCA?

22. Do you believe that there are changes in government policy and regulation in Europe, which could lead to reduced food waste and spoilage in Kenya?

23. Can you think of specific changes in practice that could be implemented by buyers, wholesalers or retailers in Europe that would reduce waste in Kenya?

24. Have you ever been treated unfairly by buyers, i.e. by non-payment, unfair rejection of produce etc? Have you used legal powers to protect your interests?
2. The Food Waste Pyramid
REFERENCES


