

# COUNTRY CASE STUDY: FOOD WASTE IN PERU AMIDST WATER SCARCITY

## INTRODUCTION

Experiences of food waste vary between businesses and product types in Peru. Some businesses experience large volumes of quality food being wasted because of unnecessarily strict **cosmetic specifications** specified by European and North American retailers. In addition, **price volatility** can cause the market value of produce to drop below production costs, leading to food being unharvested and lost.

This research has been created by environmental organisation **Feedback** with assistance from the **Sustainable Markets Intelligence Center** and support from **The Rockefeller Foundation**. Feedback travelled to Peru to interview producers and exporters of asparagus, citrus fruits (including mandarins, tangelos and grapefruit), onions, squash, avocadoes, grapes and pomegranates. The interviews showed two primary causes of supply chain food waste – cosmetic specifications and price volatility. The interviews also provide an insight into the solutions employed by businesses to reduce food waste, including diversifying their customers, selling to secondary markets, using third-party agents to inspect product rejections, using minimum and fixed prices to avoid price volatility issues, and employing improved harvest management practices.



*Ten tonnes of onions and squash waiting to be buried under sand due to cosmetic specifications, 2016*

Some businesses avoid wasting food by developing **strong secondary markets for surplus produce** that allow them to recuperate some of the production costs incurred from food that is excluded from the export market. Feedback recommends that retailers relax cosmetic specifications and ensure minimum guaranteed prices to their suppliers.

The connections in Peru between water use, water scarcity, food production, and food waste are striking. Water is scarce in Peru, particularly in the Ica Valley, which grows a significant portion of Peru's export crops yet is one of the driest places on Earth. Water use issues have become politically contentious, and the government and farmers have considered a range of solutions to the scarcity – including the complete cessation of further drilling of water wells. Reducing food waste has not been an emphasis, but it should be. The fact that water-intensive food is being wasted in an area of water scarcity is paradigmatic of global food waste, where resource-intense food is wasted amidst global resource scarcity.

# CAUSES OF FOOD WASTE

## Cosmetic Specifications

Levels of food waste caused by cosmetic specifications range from 0-40% and varied across product type, according to the farmers and exporters to whom Feedback spoke. The amount of wastage also varies between years depending on global supply and demand. When global prices are high, a greater diversity of produce is sold, whereas when prices are low, cosmetic specifications are more strictly enforced by purchasers. The size of a business's operations does not correlate with the ability to avoid waste, although businesses with a greater diversity of markets reduce their waste by selling different specifications to different global clients.

In our visits, suppliers of citrus fruits reported the greatest level of waste from cosmetic specifications. Producers said they expected a 50% exportability rate for products like tangelos. While there is a local market in Peru for citrus fruits, it can often be saturated by rejected produce from the export market, creating prices that are lower than the cost of transporting food to local markets. Of the five suppliers interviewed in this study, two reported cosmetic specifications causing food to be wasted – with rates between 10% to 40% of citrus production being buried in the ground when local market prices are low.

Suppliers of yellow (sweet) onions also experienced high levels of waste from cosmetic specifications – 10% on average, but up to 60% during years of global and regional onion abundance. An onion producer that also produced butternut squash (mostly exported to Spain and the UK) faced similar waste rates of about 10% of butternut squash production, driven by rejections on cosmetic grounds. Yellow onions are sold to both the US and European markets, allowing a variety of different presentations to be exported. However, despite this market advantage, the two onion exporters interviewed claimed to waste 7% and 10% of good, edible onions because of their shape and size on an average year. This waste amounted to 3,570 tonnes for the two businesses.

There is limited cold storage for produce destined for domestic markets, i.e. in Lima's wholesale markets. For this reason, food rejected for export because of cosmetic imperfections is often lost due to inadequate food storage. Of course, it is questionable whether the food should have been rejected for export in the first place.

Growers of asparagus, avocados, grapes and pomegranates were generally unaffected by cosmetic specifications – for illuminating reasons. Asparagus growers have good access to secondary markets for processing surplus produce. Avocados and grapes also have strong secondary markets, meaning that any surplus produce can be made into raisins (grapes) or guacamole and beauty products (avocados). In addition, avocados have a large local market and 'rejected' produce can be sold locally, albeit at roughly a third of export prices. Because pomegranates are regarded by buyers as a 'new' product, suppliers argued that buyers do not enforce



*Asparagus being graded for different cosmetic specifications required by different international markets, 2016.*

cosmetic specifications as strictly as they do with other products. This may change, as many producers noted that cosmetic specifications for other products had become stricter as their market developed.

That said, three asparagus suppliers did report waste rates of 5% to 20% of production left in the field or pack house because local prices for 'rejects' did not justify the additional costs of processing and transportation for their business. The waste across these two suppliers amounted to 240.6 tons per year.

## Price volatility

Fluctuating fresh produce prices can lead to food being wasted when the price paid for produce falls below the cost of harvest and transport. In the case of Peru during Feedback's visits, low prices caused waste of yellow onions and citrus fruit. The other types of produce studied had high prices during Feedback's visits.

Price volatility does enable suppliers to receive higher prices for their produce when global supply is low. However, some suppliers reported that, after a season with high prices for one type of produce, many new producers enter the market and existing producers expand production. Without knowledge shared between growers about production plans, this expanded production can lead to low prices and high wastage the next year. This instability and uncertainty for producers is a contrast to the position of other stakeholders in the supply chain, such as importers and retailers, who can shift risk upstream by tightening cosmetic specifications.

## WATER WASTE

The Ica Valley region of Peru is a desert with a naturally scarce water supply and is regarded as one of the driest places on the planet<sup>i</sup>. Peru's government limits the amount of water businesses can use and has banned the development of new wells. The scarcity has become politically contentious, with allegations of illegal well-drilling and complaints from smallholder farmers in poorer, wetter regions that their water is being diverted to the Ica Valley.<sup>ii</sup> Reducing food waste in the export sector has the potential to reduce the amount of water currently being used.

There is a need to develop a comprehensive water footprint of food waste in Peru to fully understand the impact food waste prevention could have on water usage. In the meantime, it is striking to consider the water footprint of the specific farms Feedback visited. Across crop types, the food waste from an average small farm (33 hectares) regularly involves an estimated freshwater input of over 100,000 m<sup>3</sup> per annum. This is enough water for about 90 Peruvians' total water consumption, including the water used to produce the food and goods they use and consume, during a year<sup>iii</sup>.

Larger farms we visited have estimated average food-waste water-footprints of over 300,000 m<sup>3</sup> per annum. As an illustrative example, one yellow onion grower, who wasted 10% of their production during an average year, reported to waste 315,000 m<sup>3</sup> of water because of cosmetic specifications. In global glut years, rejection rates can be as high as 60%, leading to 1,890,000 m<sup>3</sup> of freshwater being wasted – enough water for

Farm size / hectares	300.00
Total productivity / tonnes per annum	21,000.00
Total water use / m <sup>3</sup> per annum	3,150,000.00
Wasted produce / % of total production	10%
Wasted produce / tonnes per annum	2,100.00
Wasted water / m <sup>3</sup> per annum	315,000.00

1,700 Peruvians, just from one farm.

The figures in the table to the right relate to the wastage caused by cosmetic specifications on this farm during 2015. As this report has shown, price volatility can lead to entire harvests being left in the field leading to parallel levels of water being wasted. Extrapolating the figures provided by the above onion grower, if an entire harvest was wasted due to price, 210,00 tonnes of produce would have been wasted. This would have meant that the total 31,500,000 m<sup>3</sup> of freshwater required for the growing season would have also been unnecessarily used (enough water for almost 30,000 Peruvians).

## CURRENT INDUSTRY SOLUTIONS TO PREVENT WASTE

Producers and exporters identified five steps they take to prevent surplus food being wasted.

1. **Market diversification:** Suppliers who do not experience food waste in their operations attribute their success to having built a wide range of clients with varying product requirements.
2. **Secondary markets:** In addition to diversified primary markets, access to secondary markets prevents surplus produce being wasted as result of not meeting the specifications of the export market.
3. **Use of third party agents to inspect product claims:** Suppliers employ third party agents to inspect produce upon arrival in the destined country. Whilst the use of agents means there is a low prevalence of order cancellations and spurious rejection claims, the cost of these actors is paid for by the exporter. Suppliers agreed that legislative measures to prevent unfair trading practices such as spurious rejections would be helpful.
4. **Minimum guaranteed prices or fixed prices:** Suppliers who could negotiate minimum guaranteed prices or fixed prices on a seasonal basis avoided price volatility. Although both contractual mechanisms increase certainty of price per unit, they do not guarantee total end prices or total ordered volumes.
5. **Improved harvest management:** Suppliers dealing with citrus fruits, avocados, grapes and pomegranates limited waste from cosmetic specifications by maintaining good harvest management practices. They removed misshapen or blemished produce early in their growth, ensuring resources went only to the produce that would be sold.

## CONCLUSIONS AND RECOMMENDATIONS

Feedback recommends changes to retailers' contractual relationships with overseas suppliers (such as those visited in Peru):

1. **Retailers should take responsibility for the waste generated in their supply chains** because of cosmetic specifications. To shift the cultural expectation of uniform produce, these retailers should sell produce that is misshapen, has minor blemishes, or is outside of size specifications. In addition, retailers and other food purchasers should use produce that is currently surplus due to cosmetic specifications in value-added products such as smoothies, soups and ready meals.
2. Retailers should promote **minimum guaranteed or fixed prices** across the supply chain to reduce food waste and increase certainty for suppliers.

Suppliers also offered four suggestions for sector-wide initiatives that could lead to reduced food waste and increased incomes for suppliers:

- 1. Industry-led knowledge sharing between stakeholders regarding production forecasts:** All suppliers interviewed by Feedback argued that sharing forecasted volumes of production would allow for better informed planning amongst the industry to avoid overproduction and low prices from gluts.
- 2. Creation of processing markets for onions and squash:** Currently there are no industrial markets for surplus produce of onions and squash, meaning any produce not suitable for export market is buried. Suppliers noted that if there were processors who could produce dried, powdered or pureed products from their onions and squash, this would allow them to recuperate some of the costs incurred growing food that could not otherwise be sold.
- 3. Creation of processing markets for citrus fruit:** The citrus fruit suppliers interviewed suggested that the development of a juicing industry that accepts citrus varieties grown for export could absorb consistent levels of surplus fruit production. Although a juicing industry already exists, it does not use the varieties which are exported as whole fruit.
- 4. Greater cold storage in the central market of Lima:** Suppliers suggested that having better storage facilities in the central market of Lima would allow for produce to be stored for longer, leading to lower levels of losses at this stage in the supply chain.

In conclusion, retailers and other produce buyers can catalyse more efficient supply chains by **relaxing cosmetic standards** and **promoting price certainty** in their contractual relationships with suppliers. In exporting countries, suppliers may also be able to drive more efficient production by **sharing production forecasts** to avoid regional gluts and by **investing in secondary markets** for produce that they cannot export due to price volatility or cosmetic specifications.

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<sup>i</sup> Water Security Network, 2014. [The Ica Valley: A place of little rain.](#)

<sup>ii</sup> Water Security Network, 2014. [The Ica Valley: A place of little rain.](#)

<sup>iii</sup> Lima 2013 Blog: [Calculating the Largest Sources and Users of Water in the Americas](#) – the average Peruvian consumes goods and services that involve the use of 1100 m<sup>3</sup> of freshwater per year