



Increasing fresh produce to food rescue

Barriers and enablers for increasing donations

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Abbreviations

Abbreviation	Meaning
3PL	3rd party logistics
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
AIFS	Australian Institute of Family Studies
DC	Distribution centre
Defra	Dept. for Environment, Food and Rural Affairs (UK)
FRO	Food rescue organisation
FLC	Frontline charities
FLW	Food loss and waste
FY21	Financial year 2021
HE	Handling equipment, e.g., pallets
NFDTI	National Food Donation Tax Incentive ¹
RAF	Resource Action Fund (UK)
SFWA	Stop Food Waste Australia
TDR	Tax donation receipt
WHS	Work health and safety
WS	Wholesale(r)
WWF	World Wildlife Foundation
X-dock	Cross-dock

Executive Summary

The need for food relief is on the rise in Australia, and the food rescue organisations and frontline charities need to provide nutritionally balanced and culturally appropriate food relief.

There is a stark disconnect with an estimated 21% of Australian households experiencing severe food insecurity, and a volume as large as 52% of Australia's total food and drink purchases ending up as waste, with 37% of that being fresh produce.

The present project was a joint work package, straddling two Sector Action Plans. At the time of writing, the Food Rescue Sector Action Plan had been published and was continuously being refined, the Horticulture Sector Action Plan was in development.

The intent of the project was to explore barriers and enablers for increasing donations of fruit and vegetables to food rescue organisations. The supply chain from grower to wholesaler or retailer was investigated to understand complexities in material and information flows. A total of 42 interviews were conducted with representative actors along the fresh produce value chain, and with national and state food rescue organisations.

The interviews found enablers and barriers could be divided into five categories: Logistics, Communication, Food Rescue Organisation & Frontline Charity Operations, Financial, and Donor Operations. Most barriers and enablers were identified in Logistics and Communication.

It was not in scope of the current project to quantify the prevalence of enablers or barriers stated by the research participants. Barriers and enablers appearing to have a comparably larger influence on fresh produce donations are the ones included in the recommendations and "top tips".

Based on the conditions that either enable or inhibit fresh produce donations, a set of recommendations ("top tips") are provided to six groups of stakeholders. Recommendations are provided for: Food Rescue Organisations & Frontline Charities, Retailers, Wholesalers, Growers, Logistics Companies, and Government. The topics of the recommendations are categorised as: communication, cultural change, harvest, logistics, operations, relationships, store management, targeted funding, tax incentive, trailer utilisation, and training. Not all topics were relevant for all stakeholders.

It is apparent, that a national food donation tax incentive would have a profound effect on several barriers to food donations, fresh produce included. In the absence of this, increased produce donations can likely be achieved by further collaboration between the 6 groups of stakeholders, particularly when it comes to logistics and communication. Additionally, consideration should be given to the role of online platforms in removing barriers to harvesting fresh produce that can then be donated to – or purchased by – food rescue organisations.

Introduction

The present study was initiated because the steering committee for the Food Rescue Sector Action Plan had identified fresh produce as a high demand category with a unique set of challenges. The committee requested more information on how to increase volume and the quality of the fresh produce supply.

Food rescue organisations (FROs) procure food in two ways: they receive donations without cost from partnering organisations; and they purchase food. The acquired food is in some cases marketable food, and in other cases it is food that for several reasons cannot be put on the market. This research did not make a distinction between food donations (marketable food) and food rescue (unmarketable food), as the focus was on complexities for fresh produce in general. It is worth noting, that issues with short shelf-life of fresh produce may be exacerbated in the case of food rescue.

FROs' incoming goods come in two cadences: ad hoc or scheduled. For ad hoc donations, FROs do not know about a donation until donor contacts them. These donations are essential to FROs but difficult to manage. Scheduled donations are more or less formally arranged between donor and FRO, and the FRO gets advance notice and can manage them accordingly.

Defining food security in Australia

Food sufficiency and food security are different concepts that should not be confused. Food sufficiency refers only to there being enough food to meet dietary requirements, where food security acknowledges psychological, social and cultural factors (Pepetone, A et al., 2023). Food security is a fundamental human right and paramount to physical, mental and social health and wellbeing (Kleve, S et al., 2021).

In a 2011 to 2012 survey, ABS underreported food insecurity at 4% nationally. In 2020, the AIFS estimated between "4% and 13% of the general population are food insecure; and 22% to 32% of the Indigenous population, depending on location" (Bowden, M. 2020). A study from 2020 found that 20% of women at that time were food insecure (Kleve, S. et al., 2021), and in 2022 FoodBank Australia's Hunger Report found that 21% of Australian households had experienced severe food insecurity. Additionally, Pepetone et al. (2023) found an increasing likelihood of youth experiencing food insecurity from 2019 to 2020, with Australian odds 60% higher than in the US.

The Donation Chain

It is a complex supply chain from grower, via food rescue, to people experiencing food insecurity. From interviews with stakeholders along the supply chain an example “donation chain” was collated as seen in Figure 1.

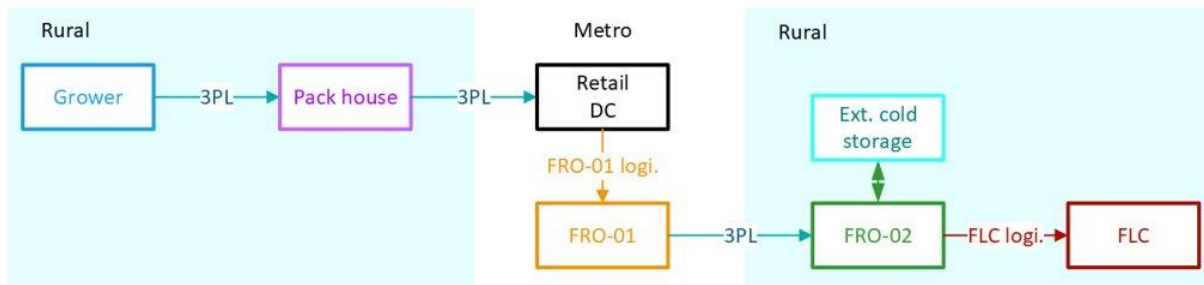


Figure 1: Example of donation chain. FRO-01 is a metropolitan food rescue organisation receiving food from a retailer’s distribution centre. FRO-02 is a rural food rescue organisation aggregating food. And FLC is a frontline charity with consumer outlet.

In this example, a small rural grower sends avocados to a third party packhouse, using third party logistics (3PL) for the delivery. The packhouse aggregates produce from several growers and transports it via 3PL to a metropolitan retail distribution centre. Due to produce size not being to the retailer’s specifications, the stock is rejected at the retail distribution centre. The packhouse can now decide whether they will pay for shipment back to their facility or donate to food rescue. The packhouse decides to donate to food rescue, and the stock is picked up by trucks owned by food rescue organisation 01 (FRO-01) and transported by this food rescue organisation’s to their metropolitan warehouse, where it is put in cold storage. A rural food rescue organisation 02 (FRO-02) orders the avocados and pays for a 3PL to deliver it to them, however the food rescue organisation 02’s cold storage is full, so the stock is sent to a local, partnering business’ cold storage. When the stock is required by a front-line charity, the stock will return to the food rescue organisation 02’s cold storage, and the frontline charity will pick up the produce and distribute to consumers.

Variations of the donation chain exist, some with less steps, some with more. In the case of fresh produce, quality of some crops deteriorates quickly which can cause downstream waste, and without a tax incentive the increased transport steps can incur increased costs to FROs, or increased costs for growers which can lead to less produce offered to food donation.

Food waste in horticulture

Fresh fruit and vegetables contribute significantly to food waste in primary production, households, institutions and hospitality. It is estimated that 37% of total food waste comes from loss and waste of horticulture products in primary production, manufacturing, and distribution alone (FIAL, 2021). 47% of Australian households throw away fresh fruit and vegetables weekly (Fight Food Waste CRC, 2019), and at a national level the loss of fruit and vegetables in primary and processing and packaging stages are between 18 to 22% of the total volume produced (Ambiel, C. et al., 2019).

In interviews for the present project, food rescue organisations felt that certain types of fresh produce were in high demand due to their sturdiness, long shelf-life, and diverse cultural suitability. The list of produce in the Figure 2 are some of the most popular produce with FROs.

Figure 2 shows the maximum pre-retail losses as reported by Ambiel et al. (2019) for the crops most popular with FRO and FLCs. The pre-retail losses for two crops with highest productions volumes, potato and tomato, are up to 19% and 36% respectively. It is estimated that 41% of cucumbers are lost before retail.

Ambiel et al. (2019) found that approx. 253 million tonnes of potatoes were lost pre-retail, and ABARES (2019) reported that Australia consumed 17 kg of potatoes per person in 2018-19, and ABS (2019) found that there were 25.2 million Australians in 2018. That means, a volume as large as 59% of Australia’s fresh potato consumption is lost or waste before reaching a retail outlet every year (Figure 3).

Overall, 7.6 million tonnes of food is wasted annually in Australia (FIAL, 2021), and ABS estimated 14.7 million tonnes of food and drink were sold in the 2021 Financial Year (ABS, 2022), i.e., a volume as large as 52% of all food and drink sold goes to waste every year (Figure 4).

PRE-RETAIL LOSSES

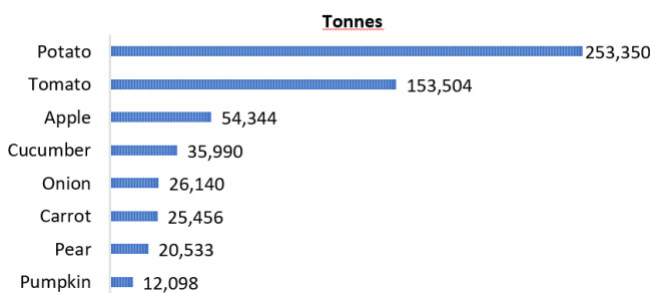


Figure 2: Maximum pre-retail losses of crops popular with FROs (Ambiel et al. 2019).

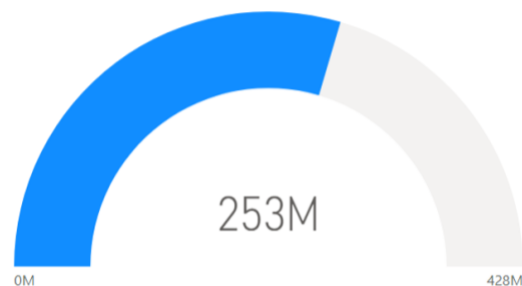


Figure 3: Pre-retail losses of potatoes vs total fresh potato consumption.

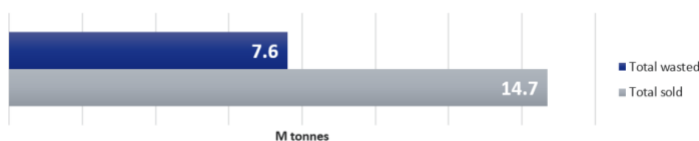


Figure 4: Total food waste (FIAL, 2021) vs food sold in Australia (ABS, 2022)

Methodology

The research approach was two-pronged. Firstly, an informal review of academic and grey literature was conducted; Secondly, a series of semi-structured interviews were conducted in-person and via video conference.

The interviews were conducted between November 2022 and February 2023. 29 of 43 interviews were conducted by the main author, 14 interviews were done in conjunction with interviews for SFWA’s Horticulture Sector Action plan. (Table 1.a and table 1.b)

The identity of the research participants and the organisations they represent was kept anonymous, to enable the information they provided to be used without risks to confidentiality, competition, or reputation. We used SFWA's industry network to try to secure broad industry representation in the study.

Additionally, one former representative of a national logistics service provider was interviewed and coded as “logistics provider” due to their extensive knowledge on the matter.

It was not in scope of the current project to quantify the prevalence of neither enablers or barriers stated by the participants. Barriers and enablers appearing to have a comparably larger influence on fresh produce donations have been included in the recommendations and “top tips” at the discretion of the author.

Table 1.a: Participant groups and unique number of organisations interviewed by the main author.

SFWA: Participant group	Unique organisations
Large grower	5
Logistics provider	3
Manufacturer	2
National food rescue org.	3
Packhouse	1
Professional services firm	1
Regional food rescue	2
Retailer	1
Small grower	1
State food rescue org.	8
Wholesale Market	1
Wholesaler	1
Total	29

Table 1.b: Participant groups and unique number of organisations interviewed in conjunction with SFWA’s Horticulture Sector Action Plan.

Horticulture SAP: Participant Group	Unique organisations
Grower group	3
Large grower	8
Small grower	3
Total	14

Literature Insights

National and internal academic and grey literature was researched for initiatives leading to increased food donations and was used to inform discussions with the research participants.

The following pages will cover initiatives that have been directly deployed to increase donations of fresh produce, or which can be reasonably expected to do so by having a broad impact on food donations.

The initiatives have been divided into three topics:

- *Food rescue*: initiatives driven by food rescue organisations.
- *Government*: policy and fundings initiatives.
- *Technology enablers*: technology platforms used to support food rescue.

Highlighted Insights: Food Rescue

Gleaning is an ancient practice of collecting unharvested crops for distribution to people experiencing food insecurity. The practice continues today with increased attention in some parts of the world. The text box below shows common concerns by growers and FROs as found in this project, which support the perceived barriers found by McBride et al. (2021)

International examples of gleaning where the common concerns are addressed:

- [National Gleaning Project](#): “provides information on national and state laws and regulations pertaining to gleaning, food recovery, and food donation; an interactive map of gleaning and food recovery organizations across the country; and reports and research created by the National Gleaning Project team. Gleaning and food recovery organisations can contribute tools like waivers, volunteer handbooks, and other documents useful to their group in the Community Resource Library”.
- [Leket Isreal](#): is a major Israeli FRO focusing on traditional gleaning. In 2021, Leket Israel rescued more than 18M kg of fruits and vegetables from farmers’ fields and packing houses.
- [The Gleaning Network](#): provides information about gleaning and map gleaning groups across UK. Gleaning information tool kits include: How to find and talk to growers; How to recruit volunteers; Redistribution; How to organise a gleaning day; Health and Safety Checklist; Fundraising Advice; and more. Another gleaning organisation is Uproot Colorado which specifically states: “UpRoot is fully insured and will respectfully facilitate the gleaning of surplus crops, safe transport to hunger-relief agencies, and ensure you receive a receipt for tax purposes”.
- *Secondary markets & gleaning*: WWF supported a trial in Maine (US-ME). [Whole Crop Harvest](#) was a model for in-field measurement, marketing of measured product, and then harvesting to order any excess produce utilising existing online marketplaces to better coordinate supply and demand ensuring low risk sales. The model deployed two harvest crews: alternate labour force (students) and local gleaning groups, which worked concurrently in the same field to optimise the time required with the farmers (Pearson, P. et al., 2019).

Text box: Growers' perceived barriers to gleaning:

- High-tech farms are not suitable for untrained pickers;
- Untrained pickers are a work health and safety (WHS) liability and require too much supervision;
- Farms and volunteers are not in the same locations;
- Volunteers are too old for gleaning;
- Yield from gleaning is too low to be worth the effort for food rescue.

Highlighted Insights: Food Rescue

Second Helping: acknowledging the challenge of connecting farmers and FROs, and the persistent labour shortage in horticulture, McBride et al. (2021) prototyped a mobile application, Second Helping, to connect farm surplus with food bank demand and source part-time 'gig economy' labor to harvest this surplus. Second Helping connected three primary users: growers, FROs and workers. The application offered two options:

1. Farmers used their existing work force, and FROs paid for picking, packing, and transportation, or
2. Second Helping sourced the work force, the FROs pay with the funds they would otherwise have used on grower's staff, and for transportation. The grower is provided with the paperwork needed to claim a tax credit for their donated produce.

The trial was successful: increased revenue for farmers; solutions improved farm labour shortages without background checks; increased data on farm surplus; and increased produce to FROs at the same price as currently paid. The authors warrant further research into avoiding increased planting for this new revenue stream (McBride, M. et al., 2021).

It is noted that option 2 may not be applicable in Australia due to the lack of a tax incentive on food donations.

Alternate Work Force: the labour shortage in Australian agriculture was a challenge even before Covid-19, and since border closures have added to the challenges of an aging and predominantly male cohort in farming (CSIRO, 2021)(Watts, S., Harrison, J.).

Nationally and internationally, an alternate work force has been used to close the gap, from:

- deploying ex-service men for technically challenging tasks in [horticulture](#) and [broadacre](#), and
- using people with convictions for sorting and packing (WRAP, 2022).

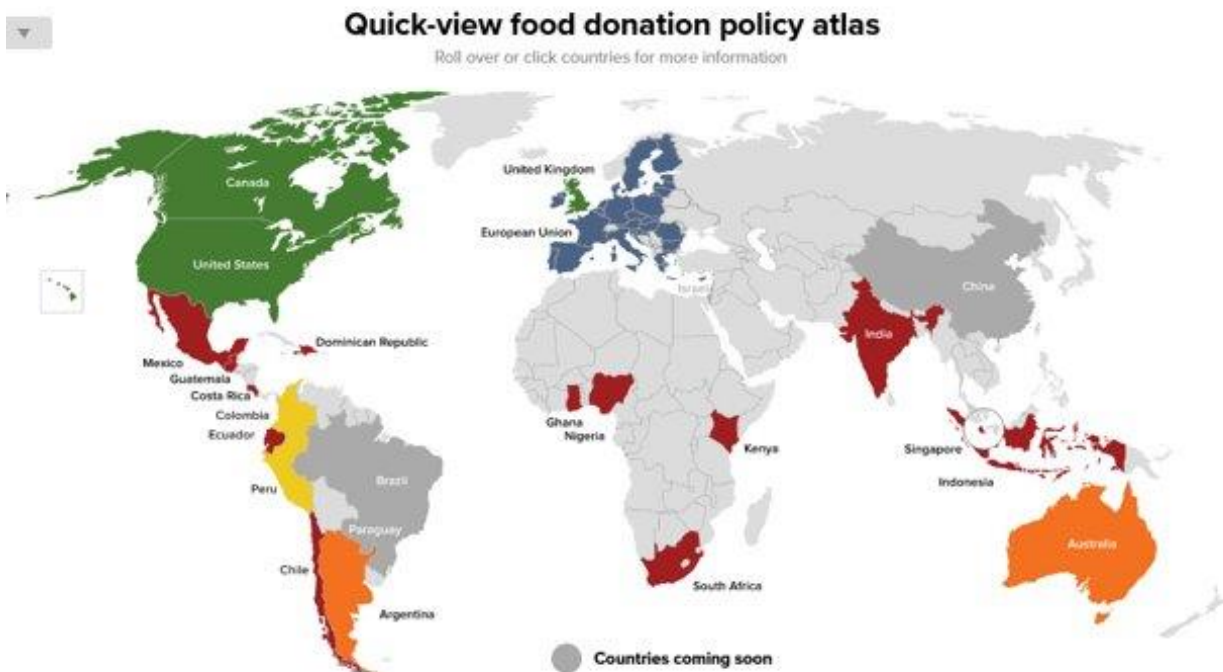
Highlighted Insights: Government

In an effort to reduce FLW, mitigate food insecurity, and increase food donation, food donors and food recovery organizations must be able to identify and understand relevant laws and policies. “Australia’s food donation laws and policies are often ambiguous, unclear, and fail to encourage food donation” (The Global Foodbanking Network, 2022).

The [Global Food Donation Policy Atlas](#) is compiled by The Global Foodbanking Network and Harvard Law School. It provides a unique overview over the current state of food donation laws and policies in participating countries. It is noted that government grants are particularly important in countries where tax incentives are considered insufficient to offset cost of donation.

As an example, the review of government grants related to food waste reduction states:

- **US – Strong Policy:** “Government offers sustainable and sufficient grants, incentives, or funding tailored for food donation activities that are widely known and claimed by relevant stakeholders. Government also offers technical assistance for effective utilization of these funds”.
- **Australia – Limited policy:** “Government has allocated funding and incentives that may be used for food recovery and donation, but it has not specifically designated funds for such a purpose. While no national grants are specifically for food donation or recovery efforts, some states and territories have their own funds to support these initiatives”.¹



The Global Food Donation Policy Atlas filtered for “Government grants and incentives related to food waste reduction”.

Government grants related to food rescue:

Below are select examples of how government funding enables fresh produce rescue.

Infrastructure funding: Infrastructure such as forklifts, cold storage and temperature-controlled transport are essential tools for rescuing fresh produce. An example from the UK, as covered by WRAP in the “Resource Action Fund – Summary Report”, the Resource Action Fund (RAF) was an AUD 32M* fund, provided by Defra to support resource efficiency projects, with the goal of diverting, reducing, and better managing waste. Started in 2018, expected lifetime of impacts was 10 years. Food waste-related projects were awarded over AUD 5.70M through RAF for necessary equipment and infrastructure such as storage, vehicles, and equipment, and costs such as training and new roles required for the delivery of these projects.

Farm Bill: this is an example from the United States, where part of the Farm Bill is The Emergency Food Assistance Program (TEFAP) under which some American states have established funding to “Farm to Food Bank”-programs that connect excess produce to FROs (Feeding America).

- **Farm to Food Bank grants:** supports harvesting, processing, packaging, or transporting of unharvested, unprocessed, or unpackaged commodities donated by agricultural producers, processors, or distributors.
- **Harvest Against Hunger:** Plays unique role in the hunger relief system by connecting farmers, transportation providers, produce packers, volunteers and FROs.

* Conversion rate 1.7828 AUD/GBP, as per <https://www.poundsterlinglive.com/history/GBP-AUD-2018>

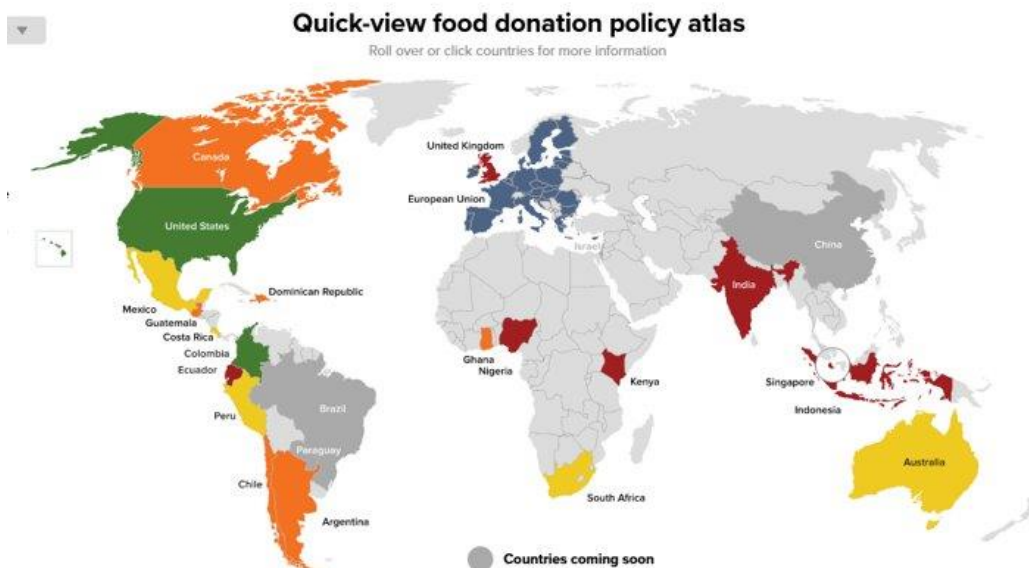
Tax incentives:

The present report gives special focus to tax incentives as it is topical with the proposed National Food Donation Tax Incentive (NFDTI).

In relation to tax incentives, The Global Food Donation Policy Atlas states that “transportation and storage cost are often cited as the main expenses that manufacturers, retailers, and restaurants need to overcome to donate food. Tax incentives can help offset these financial inputs and make donation a more attractive, affordable option” (The Global Foodbanking Network, 2022).

As an example, from The Global Foodbanking Network (2022) the review of tax incentives in:

- **US – Strong Policy:** “Government offers tax deductions and/or tax credits specifically for in-kind food donations made to qualifying institutions. Such benefits effectively position donation as an economical alternative to discarding food. There is no cap on the benefit based on the donor’s revenue, or the cap is over 10 percent of the donor’s annual revenue”.
- **Australia – Moderate policy:** “Government offers tax deductions and/or tax credits for food donations made to food recovery organizations. While the valuation of the donated food enables donors to claim a practical benefit, the benefit cap or limit is too low to offset the costs of a donation (below 10 percent of the donor’s annual revenue)”.



The Global Food Donation Policy Atlas filtered for “Tax incentives”.

Tax incentives, continued:

In 2020, the European Commission mapped and analysed existing regulatory and policy measures impacting food redistribution from EU Member States. All member states were scored against several measures under the categories: National Strategy, Legal Measures, Fiscal Incentives, Voluntary Agreements, and Other Initiatives (Table 2).

The tax rules regarding food donations in the below EU Member States are used here as examples of how differently fiscal incentives are applied in the EU (European Commission, 2020):

- **France:** Food donations are not subject to VAT. Donors get a tax credit of 60% of the donated value, with a cap of 0.5% of company turnover. The tax deduction is also applicable to the delivery, transformation, and storage of redistributed food.
- **Netherlands:** Food donations are VAT exempt, though a donation threshold exists. Corporate tax deduction exists: 100% of the donation is deductible if the food is no longer suitable for the market and the value of the donation is below 50% of €100,000.
- **Portugal:** VAT is not charged on food donated. A tax deduction exists which is equal to the adjusted tax basis of the donated products, plus an incentive of 20%, 30%, or 40% depending on the institution. A limit exists of 0.08% of company turnover.

France’s fiscal incentives are being highlighted as stimulating food donations. (European Food Banks Federation, 2021)

For further understanding of the proposed NFDTI and other countries’ tax initiatives, the reader is recommended to refer to the KPMG report (2020).

Table 2: Excerpt from Appendix 5: Food redistribution: Comparative analysis of the existing policy and levels of implementation within Member States (European Commission, 2020).

	National strategy				Legal measures										Fiscal incentives		Voluntary Agreements	Other initiatives				
	Presence of a national food waste strategy including food redistribution measures	Addition of the EU F23 or more ambitious goals, covering the aspects of food redistribution to meet these goals	Availability of guidelines to facilitate and promote food donation	Call to develop and strengthen relationships between food redistribution actors	Presence of a legal framework specific to food redistribution in addition to EU rules	Presence of a food use hierarchy	Presence of a clear traceability regime for food redistribution	Presence of guidelines which clarify the liability regime for food redistribution	Presence of a clear liability regime for food redistribution	Presence of guidelines which clarify the liability regime for food redistribution	Presence of national rules in addition to EU rules to simplify requirements for food redistribution, clarifying EU rules and making them easier to understand for relevant actors	Presence of national guidelines regarding hygiene requirements for food redistribution, clarifying EU requirements (language and labelling requirements, separate from date marking)	Donation requirements in line with EU recommendations on "best before" date	Presence of national guidelines on requirements for food redistribution (language and labelling requirements, separate from date marking)	Presence of national guidelines regarding food redistribution, where to clarify the requirements for food redistribution	Presence of a food regime specific to food redistribution	Presence of guidelines to clarify how to address corporate food waste in the EU (EU F23/F24) in line with Regulation (EU) 1303/20	Use of the FEAD operational programme to address food waste in the collection, storage and distribution of redistribution actors	Presence of measures encouraging the redistribution of food and supporting collection, storage and distribution of redistribution actors	Publication of peer-reviewed research related to food redistribution	Presence of financial or logistic support for food redistribution at the national/regional level	Presence of incentives for the introduction of food redistribution systems, which may otherwise hinder redistribution of the incentives for an already existing recovery route for food redistribution
*Mature countries																						
Austria																						
Belgium																						
Denmark																						
Estonia																						
France																						

Highlighted Insights: Technology enablers

Harvard Business Review on technology and change: “Technology has the ability to remove friction and allow people to do their jobs with speed and agility. However, technology should not be at the centre of transformation, people should.” (Higgins, D. & Bianzoni, N. M., 2020)

Below are some examples of how technology can enable the material flow of food donations more efficiently.



HarvestMark (iFoodDS) is a quality management technology with the additional feature of streamlining food donations from two major retailers’ distribution centres in Australia. Suppliers are notified about retailer QC rejects, and they can efficiently start the donation through HarvestMark. Through the ‘Disposition Feature’, Foodbank has been able to significantly increase volumes of food relief across diverse communities in Australia.



Food Rescue Hero’s technology automates the time-consuming task of coordinating retail food recovery. The platform connects more than 34,000 volunteers in the US and Canada. From 2015-21, 30,800 T food has been rescued, 80% of which is fresh produce.



Plan Zheroes is a food donation platform enabling food businesses to donate surplus food to nearby charities and community groups. The platform is UK based with more than 1,600 business, charity and volunteer members. From 2010-21, +500 T food was rescue via the platform, and more than 50% of the redistributed food is fresh food. Both free and paid membership structure exists.



Yume’s platform automates the sale and donation of surplus food. Part of Yume’s enterprise to enterprise tool, is that the donation processes are also digitised. That way, manufacturers can donate their surplus to charities, so more food can reach people in need, fresh and fast.

Summary of findings

On the following pages is found an overview of the unique conditions that can either enable more fresh produce to reach food rescue organisations or be a barrier. The enablers and barriers were condensed from statements from the interviews with research participants.

At the beginning of this project, senior staff from Australia's largest food rescue organisations were interviewed and stated some high-level challenges for fresh produce and food rescue:

- **Distance:** growing regions are disperse and usually in less populated areas. Transport from where the produce is grown, to where it is needed is challenging and costly, particularly as some produce have short shelf-life and needs refrigerated transport.
- **Cost of handling:** growers will not make a profit on produce diverted to food rescue, and will rarely recover costs. This is a barrier to donations, in the absence of a tax incentive. The growers' effort to get produce to food rescue needs to be aligned with the size of their business, i.e., small growers want to use minimal effort as profits are small, and larger growers have the opportunity to lead.
- **"Surprise chain":** FROs generally have low visibility on incoming food donations. This makes every day operations challenging, though FROs have learned to juggle the "push"-logistics. Weather impacts are impossible to manage, but increased access to produce supply forecasts would enable FROs to organise logistics more cost effectively, to the benefit of both FRO and their logistics partners.
- **Infrastructure funding:** is essential and in order for the FROs' to meet demand, higher volume and more consistent funding for infrastructure is warranted. Increased supply of fresh produce is only useful with logistics in place to move and store it.
- **Education:** often growers are unaware of how and what to donate, and to whom. Additionally, education of "first responders" would enable produce to be as fresh as possible when donated. The expression "first responder" is used to describe the first person in the donation chain to know that there is stock which should be diverted to food rescue.

Overview of enablers and barriers

In the tables 3, the enablers and barriers to fresh produce donations are summarised with short titles. Each enabler and barrier are elaborated upon in the following pages.

Table 3: Enablers and barriers to fresh produce donations categorised by topic.

Enablers	Barriers
Logistics	
<ul style="list-style-type: none"> Bins-On-Farm-model enables efficient donations Regional FROs partner w. local businesses to increase cold storage capacity Direct connection between regional retailer and FRO/FLC Packhouses as logistics hubs for smaller growers Logistics-FRO partnerships are win-win: Increased utilisations and flexibility Wholesalers and WS markets can X-dock* for FROs 	<ul style="list-style-type: none"> External pressures on 3PLs limit services for FROs Regional grower perception: FROs can't reach them Challenging network building w. 3PLs and growers FLCs have limited infrastructure to handle and store Donors, FROs, FLCs have limited capacity to cold store
Communication	
<ul style="list-style-type: none"> Software enables efficient produce donations Promotion of retail store's food rescue initiatives Early notice on availability improves efficiencies Wholesale market authorities as comms channel for FR Efficient resolution of conflicts between retail and FRO/FLC Horticulture newsletters as comms channel for FR 	<ul style="list-style-type: none"> Communications channel lost when donor's FRO contact moves role Growers and wholesalers rely on direct contact "First responders" could execute donations faster Current donors want clarity on what to donate FROs resource constraint to train "first responders" Prospect donors unsure how to start donating
FRO & FLC Operations	
<ul style="list-style-type: none"> Scheduled donations preferred by all Extensive in-store sorting provides produce to FRO/FLCs FLCs prefer meal kit portion donations 	<ul style="list-style-type: none"> Seasonality and overproduction puts pressure on donation chain Restricted FRO/FLC operating hours limits donations Unclear agreements on branded products
Financial	
<ul style="list-style-type: none"> Wholesalers claim retail price tax deduction Large grower find resources for food rescue harvest 	<ul style="list-style-type: none"> Government funding life span too short for proper impact Growers pressured by costs and prices Tax deductions not worth the effort for growers
Donor operations	
<ul style="list-style-type: none"> Centralised targets improves retail food rescue Endorsement by management enables good food rescue 	<ul style="list-style-type: none"> Food donation not part of KPIs for the right people in donor orgs. Donors do not celebrate their food rescue efforts sufficiently Food rescue budget allocation

* X-dock or Cross-docking is a logistics procedure where products from a supplier are distributed directly to a customer with marginal to handling or storage time.

Enablers and barriers – Logistics

ENABLERS

Some FROs have established a “Bins-On-Farms” solution of placing packaging, e.g., bins, in growers’ pack sheds and packhouses to capture out-of-specification produce. This was reported to make the donations very efficient, and was a preferred solution by both FROs and growers. All parties along the donation chain having accounts with relevant packaging pooling companies furthers the efficiency.

Direct connection between regional retail stores and food rescue and relief organisations enables efficient transfer of fresh produce. Food rescue is enhanced, when these relationships are supported by centralised FROs.

Collaboration between logistics companies and FROs is win-win, as the logistics company can increase fleet utilisation and do this with stock that is less time-sensitive than regular consignments. One FRO reported on the successful model, where a grower could not fill the assigned trailer to send to market each day in peak season, so the excess space could be filled with out-graded produce whenever there was space.

One regional FRO told about a well-established relationship with local food businesses allowing them to use their cold storage, when the FRO’s own cold storage was full.

Packhouses are being targeted for donations, as they are logistics hubs for multiple, smaller growers.

Wholesalers and WS markets act as cross-dock between growers or packhouses and FROs. This type of logistics donation is efficient due to the strong existing relationship wholesalers and suppliers.

BARRIERS

External pressures on logistics industry is a barrier for 3PLs to provide pro or low bono services to food rescue. These pressures are quoted to be increased fuel prices, a persistent labour shortage of drivers, and the broader effects of Covid on society.

It can be challenging to establish new relationships with 3PLs and growers. One FRO reported that even with existing, successful relationships within the logistics and horticulture industries, they had not been able to establishing new relationships with 3PLs and growers.

Donors, FRO and FLCs have limited capacity to store temperature sensitive stock, which creates inefficiencies throughout the donation chain with additional coordination between donor and FRO or FLCs and with each organisation.

Several of the regional growers interviewed had the perception that they were too remote to participate in food rescue. A perceptual barrier was that the cost of freight was prohibitive for them to donate.

FLCs are hard-pressed on infrastructure to handle and store food, particularly temperature sensitive stock. Stakeholders reported that lack of cold storage, handling equipment (e.g., forklifts), or accounts with handling equipment pool companies can all make material flow less efficient.

Enablers and Barriers – Communication

ENABLERS

The integration of food rescue into HarvestMark was reported to make communications easy regarding fresh produce donations. The increased efficiency was reported to improve freshness of donated produce.

Early notice on produce availability enables donor and FRO to organise logistics most efficiently. As much advance notice as possible can make a difference for the cost of logistics to FROs and downstream food waste of perishable produce.

A major retailer highlighted an efficient internal escalation process for disputes between retail stores and FRO or FLCs. For example, if a retail store has not processed a donation in an optimal way, a charity can contact retailer HQ and the store will be instructed on how to improve.

Individual retail stores initiate programmes with local FROs and FLCs. This is promoted in the retail company’s newsletters, with the aim to inspire other stores and increase staff engagement.

Wholesale market authorities are well-placed to provide information about food rescue and introduce food rescue staff to their tenants. As an example, one WS market uses their internal information screens to promote food rescue, and the food rescue staff is reintroduced to frequently.

There was general agreement from all fresh produce actors that horticulture newsletters are a good place to communicate about what and how to donate.

BARRIERS

Several fresh produce donors reported incidences where they had lost their food rescue contact, and a new contact had not been introduced. One donor mentioned a period of time where they had been emailing a person without response or delivery issue, only to be notified later that the person had moved on.

Food donations can be delayed at donor’s “first responder” due to lack of clear direction from donor’s management, and/or lack of training in how to execute food donations. For fresh produce, this delay can result in food waste due to produce sensitivity.

In order to reduce the time between when stock is identified for donation and the donation is executed, donor’s “first responder” needs to be trained in how to execute donations. This will require FRO resources to provide the training.

Growers and wholesalers rely on direct contact, mostly via phone. This could be a barrier to drive change when considering implementing software platforms to assist food donations.

A broad range of donors, from growers to manufacturers, indicated that they were not completely sure about what produce FROs would like, particularly in peak season. One corporate farm suggested weekly updates on FRO’s produce demand to optimise donor’s internal processes.

Growers large and small gave accounts of wanting to donate but they did not know how to get started. Primary initial barrier was that they did not know who to contact.

Enablers and Barriers – FRO & FLO Operations

ENABLERS

Scheduled donations are preferred by all, as they enable all parties involved to forecast more efficiently. This improves FROs' ability to budget and negotiate freight solutions. Strategic partnership with large farms enables this.

Extensive sorting of fresh produce in retail stores provides produce to FRO and FLCs. It is common practice that fresh produce is sorted several times per day, where retail staff removes produce that is deemed undesirable. This is the basis of fresh produce donated at retail store level.

FLCs prefer meal kit portion donations, because the portion size make it easy to distribute to food relief consumers.

BARRIERS

Seasonality and overproduction puts pressure on donation chain. Certain crops, e.g., stone fruit, have been reported to consistently cause issues throughout the donation chain, as they have a limited peak season and is generally overgrown. This may cause increased costs for FRO and FLCs due to handling and waste management. It may also strain relationships with donors, due to the perception that FRO and FLCs should not reject food, and because donors ideally want one FRO or FLC to take the lot to maximise resource efficiency. There is currently no method for longer term stabilisation of sudden, high volume fresh produce donations.

Restricted FRO and FLC operating hours pressures cold chain capacity, and can be a nuisance for donors. Due to FRO and FLCs relying on volunteers, food deliveries can only be handled in week days with limitations on Fridays. This creates an uneven efflux of donated stock on donor's end, which is a challenge for donor's internal logistics, e.g., cold storage.

Agreements on branded products are unclear. What happens to their products when sent to food rescue, is a common concern for food brands. Agreements exist between food brands and FROs on how to handle branded product, but they are inconsistent and not always clearly communicated. This can cause inefficiencies, particularly for manufacturers of customer branded product that want to donate, when they do not have the control to determine how to handle branded product and no agreement exists.

Enablers and barriers – Financial

ENABLERS

Wholesalers are able to claim tax deductions based on the retail price of the donated stock. This has not been confirmed by the exact parties involved with the deduction. If accurate, this would mean that donations are more 'valuable' for actors later in the produce supply chain. However, this will depend on donor's tax loss position.

One large grower reported that they will harvest otherwise unsellable crop for food rescue and incur the cost of harvest. The crop might become unsellable due to oversupply and price dumps. This was not standard operating procedure but happened regularly.

BARRIERS

The life span of governments' emergency funding was reported to be too short to have the desired impact. Though reported to have improved, it was reported that previous emergency relief funding had caused increased food waste as FRO and FLCs were forced to spend funding on food without the necessary means to store the food, and that the amount of funding allocated to fresh food was misaligned with the consumption for that period of time.

Increased costs of inputs and labour shortages have made growers increasingly vulnerable to crop price dumps. This leads to crop by-pass which means that seconds or other stock normally diverted to FROs is not available.

It was reported by FRO staff that the donation tax deduction claimable by growers was not worth the effort of either: lodging a tax claim for donated stock; or executing the donation in the first place.

Enablers and barriers – Donor Operations

ENABLERS

Centralised targets from a donor's head office create a clear vision for staff executing the donation. This was reported to enable successful donation programs for large retailers.

Management's endorsement of food rescue was reported to be mainstay in the best working relationships between donors and FROs. Conversely, the lack of endorsement from donor's senior management can render the relationship unsuccessful.

BARRIERS

Food rescue or donation not being part of KPIs for the roles directly involved with food donations poses a risk for consistent quality of the donation relationship. It was a clear request from FROs to incorporate food rescue into the KPIs of donor's staff, which would also ensure consistency when donor's staff change roles.

Some donor organisations expressed a desire to celebrate their food rescue efforts more internally and externally. Though this was not stated to be a barrier to donations, it was understood that this could inhibit donations if these efforts were not business as usual.

One large manufacturer had identified a considerable barrier when stock donations required inter-department approval. This was particularly a barrier for short shelf-life product, as the slow-moving communications and decision-process between departments could result in donation stock exceeded its use-by dates. They were now working on aligning a budget allocation for food rescue with their internal food rescue targets.

Recommendations

Based on the findings, a set of recommendations are provided to six groups of stakeholders. The recommendations can be found in the following “Top Tips”.

The feasibility of each recommendation will rely on the individual stakeholder’s circumstances, however it has been attempted to avoid recommendations that would require considerable additional resourcing.

The table below shows each group of stakeholders and the topics of the recommendations. A map of the recommendations and the corresponding statements can be found in Appendix I.

Table 4: Topics of recommendations grouped by stakeholders.

<u>Stakeholder</u>	<u>Recommendation topics</u>
FRO and FLCs	<ul style="list-style-type: none"> • Logistics • Operations • Communication
Retailers	<ul style="list-style-type: none"> • Training • Relationships • Tax incentive • Cultural change • Store management
Wholesalers	<ul style="list-style-type: none"> • Training • Logistics • Communication • Relationships • Tax incentive • Cultural change
Growers	<ul style="list-style-type: none"> • Training • Logistics • Communication • Relationships • Tax incentive • Harvest • Cultural change
Logistics co.	<ul style="list-style-type: none"> • Training • Relationships • Tax incentive • Cultural change • Trailer utilisation
Government	<ul style="list-style-type: none"> • Tax incentive • Targeted funding

Top Tips – Food Rescue Organisations and Frontline Charities

Communications:

- Uncertainty on how to donate persists with prospective donors, regardless of individual FROs efforts. Consider concerted communications campaign.
- Consider a concerted effort with other FROs to create and deliver training assets targeted at "first responders" in donor organisations.
- Use wholesale markets and horticulture newsletters as channels for targeted communications.
- Make sure all accounts are being well managed when your staff changes roles.
- Make sure that growers in regions currently covered by your logistics network, know that logistics are available for food rescue.
- In case of excess supply, update donating growers about your produce demands on a weekly basis.

Logistics:

- Explore opportunities to extend Bins-On-Farms solutions.
- Create targeted and consistent assets to inform logistics companies about the opportunities for improved efficiencies when partnering with FROs.
- Empower retailers and growers to establish direct networks to local food rescue and relief organisations.
- Engage with wholesalers to explore possibilities to use them for cross-docking.
- Engage further with packhouses, as they are gateways into regional supply.
- Explore partnerships with local businesses to use their cold storage when yours is full.

Operations:

- Explore options for extending opening hours to optimise the flow of fresh produce.
- Consider options to receive forecasts on gluts from key stakeholders, e.g., collaborating wholesale markets and growers.

Top tips for retailers

Cultural change:

- Effective food rescue relies on senior management’s endorsement.
- Set and track measurable targets for your organisation’s food rescue efforts.
- Embed food rescue into the KPIs of staff executing donations.

Training:

- Identify and train “first responder/s” in your organisation – these are the people who are the first to know when stock is available for donation.
- Educate these team members on why food donation is important and support them to deliver effectively.

Relationships:

- Introduce and endorse food rescue organisations to your suppliers. You can help reinforce and support partnerships between yourself, food rescue organisations, growers and logistics companies.

In store:

- Ensure that disputes between stores and food rescue organisations are handled promptly and efficiently.
- Promote, encourage, and support store’s food rescue initiatives.
- Let food rescue partners know as early as possible, and in as much detail as possible once you know you have surplus stock for donation.

Top tips for wholesalers

Cultural change

- Effective food rescue relies on senior management’s endorsement.
- Set and track measurable targets for your organisation’s food rescue efforts.
- Embed food rescue into the KPIs of staff executing donations.

Training:

- Identify and train “first responder/s” in your organisation – these are the people who are first to know when stock is available for donation.
- Educate these team members on why food donation is important and support them to deliver effectively.

Logistics:

- Explore possibilities for optimising trailer utilisation by acting as cross-dock between growers and food rescue organisations.

Relationships:

- Introduce and endorse food rescue organisations to your suppliers. You can help reinforce and support partnerships between yourself, food rescue organisations, growers and logistics companies.

Communication:

- Let food rescue partners know as early as possible, and in as much detail as possible, once you know you have surplus stock for donation.

Top tips for growers

Logistics:

- Ahead of harvest, contact food rescue organisations to understand the possibilities for food rescue in your area.
- Don't let transportation concerns stop you – food rescue organisations are used to organising logistics and have partnerships with nationwide transport companies. They'd prefer you ask.
- Consider placing bins and crates on farm to make sorting for food rescue easier. Food rescue organisations can often help with this.
- If you use an external packhouse, engage with them on sending stock to food rescue.
- Ask your wholesaler if you can use them as cross-dock and put stock for food rescue on empty pallet spaces.

Cultural Change:

- Effective food rescue relies on senior management's endorsement.
- Set and track measurable targets for your food rescue efforts.
- Embed food rescue into the KPIs of staff executing donations.

Communication:

- Let food rescue partners know as early as possible in as much detail as possible once you know you have surplus stock for donation.

Relationships:

- Introduce and endorse food rescue organisations to your network. Help reinforce relationships between food rescue and other growers.

Harvest:

- Consider harvesting for food rescue. Food rescue organisations often take produce with wider specs than normal markets.

Top tips for logistics companies

Trailer utilisation:

- Working with food rescue can increase trailer utilisation with stock that is less time-sensitive than your regular consignments.
- Proactively contact local food rescue organisations, let them know of routes that are often underutilised.
- Food rescue relies on cost effective logistics and every pro bono kilometre helps.

Cultural Change:

- Effective food rescue relies on senior management’s endorsement.
- Set and track measurable targets for organization’s food rescue efforts.
- Embed food rescue into KPIs of staff executing donations.

Training:

- Identify and train “first responder/s” in your organisation – these are the people who are first to know when stock is available for donation.
- Educate these team members on why food donation is important and support them to deliver effectively.

Relationships:

- Introduce and endorse food rescue organisations to your network. Share with your partners how you work effectively with food rescue.

Top tips for Government

Tax incentive:

A national food donation tax incentive (NFDTI) is projected to:

- Generate \$2bn p.a. in social, economic, and environmental benefits.
- Increase food donation by alleviating key cost and capacity barriers for businesses.
- Help Australia achieve its stated target of halving food waste by 2030 by ensuring surplus food is donated instead of wasted.
- Align Australia’s food rescue regulation with major developed countries such as the US and EU members.
- Allow businesses to proactively invest in supporting Australia’s food waste reduction target.

Targeted Funding:

- Funding for food purchases is good, but a prerequisite is that the food rescue organisations and frontline charities have the appropriate funding for food storage and logistics.
- Food relief funding needs to have a long-life span, for example food relief in case of natural disasters is required for an extended period after the immediate emergency.

Conclusion

The Global Foodbanking Network stated in their recommendations for policy changes in Australia, that “food donation helps mitigate the costs of hunger and stimulate the economy, but it can also be expensive, as food donors must allocate time and money to recover, package, store, and transport surplus food that otherwise would be discarded” (The Global Foodbanking Network, 2022). Changing tax laws to enable and incentivise companies to donate stock and services is essential to increase food donations in Australia, and industry leaders support this (KPMG, 2022).

To increase the amount of fresh produce reaching people in need, the capacity of frontline charities to handle and store fresh produce will have to increase. One FRO state manager commented that supply of fresh produce was a smaller challenge than the downstream bottleneck of frontline charities’ infrastructure.

Aside from the recommendations covered in the “top tips”, other initiatives were identified through this research which could increase fresh produce donations:

- Gleaning is used worldwide to source fresh produce for donation, however the 4 partnering FROs in this study agreed that it was not feasible for them to execute. It should be considered if well-established FROs could provide best practice guidance on topics such as: how to manage volunteers; WHS on farms; legal aspects of gleaning; and facilitate contacts, as done by the National Gleaning Project in the US.
- Reaching remote communities is a recurrent and persistent challenge, which has been exacerbated by external factors such as truck driver shortages and soaring fuel prices. Community gardens have been suggested to increase accessibility to fresh produce and should be considered as a way to build social capital and increase access to healthy, culturally appropriate food (Burt, K. G. et al., 2020). Community or market gardens were also recommended by Arup for a remote setting in QLD (Scuderi, P.). It should be considered by FROs, government and regional businesses, how they can support community gardens.
- Bridging the gaps between growers’ cost recovery, labour shortages and FRO’s demand for fresh produce: Second Helping was an example of how an alternate work force could be activated to pick otherwise lost food and donate to food rescue (McBride, M. et al, 2021). The business case presented in the study (Mcbride, M. et al, 2021) should be tested in an Australian setting to assess feasibility. FROs could leverage their expertise in organising volunteers, local councils could mobilise alternate harvest crews, which combined would enable growers to harvest rather than by-pass crops and provide more produce to FROs at competitive prices.
- Technology platforms should be considered where there are known nexuses in fresh produce supply chain, e.g., packhouses or wholesalers. Solutions like HarvestMark could be deployed more widely in other software systems (Ironbark and Muddy Boots were mentioned in interviews). An expected challenge is the different platforms are used, and that there may be resistance to change for using software with some stakeholders.

Recommendations to progress:

- Targeted communication to current and prospective donors' "first responders" is recommended to increase donations. To further the understanding of which roles in donating organisations execute donations it is recommended to interview select donors, and to develop concerted, targeted training assets for these roles.
- More research is warranted on the causality between tight retailer specifications on produce, incidences of crop by-pass and their effect on the amounts of lower grade produce available for food donation. Part of this could be to further the understanding of whole crop purchase agreements in Australia, and their effect on produce donations.
- It was reported that frontline charities in Queensland had amalgamated in the past, and that this had led to increased efficiencies of donations. Research should be conducted into the reasons for this amalgamation, and its effect on number of people served, and the effect it has had on FRO and FLC funding.

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