

# **Price Check on Food Waste: Mobilising Metro Vancouver Grocers in the Fight Against Food Waste**

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## **Abstract**

Food waste continues to be a major contributor of greenhouse gas emissions globally, yet public policies to address food waste at retail, particularly small and medium-sized food retailers, remain understudied. Two case studies on small Metro Vancouver grocers and a jurisdictional scan of four foreign countries were conducted to understand the current state of food waste mitigation by small grocers; and to identify potential food waste policy interventions appropriate for the sector. The analysis suggests that policy interventions must focus on lowering the barriers that small and medium-sized grocers face, such as a lack of financial resources, awareness, and expertise to prioritize and implement food waste mitigation practices, in a manner according to the food waste solutions hierarchy. Based on these findings, the author offers a variety of policy instruments – regulatory, fiscal, and voluntary agreements – to mitigate food waste in the retail sector.

**Keywords:** food waste; retail; grocer; small and medium-sized; Metro Vancouver; policy

## **Dedication**

This work is dedicated to my family and friends, whose words of encouragement and care packages have supported me throughout the process. To my beloved husband who never left my side during the challenges of school and life during a pandemic, this paper is as much yours as it is mine. Without your unwavering trust, patience, and support, this paper would have remained unfinished. To my dear friend Victoria, we should have asked for stamp cards for all the coffee we consumed working each weekend! But seriously, thank you for encouraging me page by page. To my sisters and brother, Michele, Lisa, and Louis, every treat and reminder of the finish line kept me going. Lastly, to my dad, thank you for checking up on me to make sure I was alive, well fed, and doing my best.

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## List of Acronyms

AAFC	Agriculture and Agri-Food Canada
BC	British Columbia
BCMECCS	BC Ministry of Environment and Climate Change Strategy
C/I	Commercial / institutional
COVID	Coronavirus
EC	European Commission
ECCC	Environment and Climate Change Canada
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FLI	Food Loss Index
FSC	Food supply chain
FW	Food waste
FWI	Food Waste Index
GHG	Greenhouse gas
ISWRMP	Integrated Solid Waste and Resource Management Plan
PCFWC	Pacific Coast Food Waste Commitment
SDG	Sustainable Development Goal
SFU	Simon Fraser University
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
US	United States

## Glossary

Best before date (BBD)	The date found on a product label and until which the product maintains its maximum quality.
Circular economy	A model of production and consumption that promotes the elimination of waste through regenerative design.
Cold chain	A temperature-controlled supply chain.
Expiry date	The date found on a product label and in which the product is no longer safe to consume thereafter.
Food insecurity	The inability or uncertainty to reliably consume a diet of adequate quantity, of nutritious quality, and of culturally acceptable foods.
Food loss	Food and the associated inedible parts that are removed from the human food supply chain from post-harvest or post-slaughter up to, but excluding retail and consumption, and do not re-enter in any other utilization.
Food security	The ability to reliably consume a diet of adequate quantity, of nutritious quality, and of culturally acceptable foods.
Food waste	Food and the associated inedible parts that are removed from the human food supply chain at the retail, food service, and household levels.
Food waste index (FWI)	A compound measure of total food waste at the retail, food service, and household sectors; expressed as an index relative to the level of food waste in the baseline year.

## Executive Summary

Food waste continues to be a major contributor of greenhouse gas emissions globally, yet public policies to address food waste at retail, particularly small and medium-sized food retailers, remain understudied. It is estimated that nearly 35,000 tonnes of food were wasted in Metro Vancouver in 2018, of which more than half came from the commercial / institutional sector. The current state of food waste demonstrates that mitigation is not sufficient in the retail sector; thus, this study aims to contribute to the knowledge of food waste management practices of small grocers and to identify public policy interventions that target their food waste reduction barriers.

A mixed methodology is used in this study and includes a literature review, jurisdictional scan, and two case studies (consisting of interviews and on-site observations) of small family-owned and operated grocery stores located in Metro Vancouver. The research findings indicate that food waste mitigation practices of small grocers are limited compared to larger food retailers due to senior management priorities, whereas fewer financial, human, and technical resources are available among small retailers. For example, large grocers may have personnel devoted to food waste measurement and reduction, whereas small grocers do not. The findings suggest a variety of policy instruments – regulations, taxes, sanctions, and voluntary agreements – used in other foreign jurisdictions have potential for application to the Metro Vancouver retail sector.

Based on these findings, three policy options are proposed: mandatory food donation and employee training by food retailers; property tax reduction for food retailers who donate food; and grants for eligible small and medium-sized grocers who join the Pacific Coast Food Waste Commitment. These policy options are analysed using environmental sustainability as the key objective. Stakeholder compliance, stakeholder acceptance, cost, and administrative complexity are analysed as key impacts. Based on the trade-offs, strengths, and weaknesses of each policy option identified in the analysis, this report recommends that municipal administrations within Metro Vancouver immediately implement mandatory food donation and training, along with a food donation tax reduction. In the medium term, this report recommends grants for businesses who join the commitment. This has potential for greater sustainable

prevention of food waste by retailers and goes beyond to include manufacturers, distributors, restaurants, caterers, brand owners, and consumers as well.

# Chapter 1. Introduction

Over the past decade, food waste (FW) has become increasingly studied and salient among policymakers, industry professionals, and advocacy groups. In 2015, Canada adopted the 2030 Agenda for Sustainable Development at the United Nations (UN) General Assembly along with all other UN Member States (Employment and Social Development Canada, 2021). Among the 17 Sustainable Development Goals (SDG) are Target 12, "ensure sustainable production and consumption patterns" and Target 12.3, "by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses" (United Nations Environment Programme [UNEP], 2021). Thus began the significant task of reducing, measuring, tracking, and understanding causes of FW throughout the Canadian food supply chain (FSC) by academics and policy makers (Environment and Climate Change Canada (ECCC) (2019)).

Yet despite consumer educational campaigns and residential organic waste bans to prevent FW from entering landfills in Metro Vancouver, spoiled or uneaten food makes up approximately 14% of the region's solid waste sent to landfills (TRI Environmental Consulting, 2019). Globally, it is estimated that 931 million tonnes of FW was generated in 2019, of which 61% came from households, 26% from food service (e.g., restaurants), and 13% from food retail (UNEP, 2021). Food waste that ends up in landfills emits greenhouse gases (GHGs) as they decompose, negatively impacting the environment and contributing to climate change. Emitting 8-10% of global GHG emissions annually, global FW is the third largest contributor of GHG emissions in the world (Climate Watch, 2021; ECCC, 2021; UNEP, 2021, p.4).

Within Metro Vancouver, it is estimated that nearly 35,000 tonnes of food was wasted in 2018, of which more than half (51%) came from the combined commercial / institutional sector (C/I) (TRI Environmental Consulting, 2019). Although progress in reducing FW at the household level can be seen, especially after the region's introduction of the FW disposal ban in 2015 (Metro Vancouver, 2015), compostable organic waste increased in C/I (includes food retailers and food service) by approximately 28% from 69 kg per worker in 2016 to 88 kg per worker in 2018 (TRI Environmental Consulting, 2019, p. 19).

## **1.1. Problem Statement**

It is evident that the current state of FW mitigation is not sufficient in the retail sector in Metro Vancouver. Not much is known regarding the amount of FW and the mitigation practices and policies of small grocers. The academic and grey literature on FW by food retailers has identified various causes in this sector; however, public policies to address these issues remain understudied (de Moraes et al., 2020).

In general, FW is still greatest at the household level and has resulted in extensive research in this area. In contrast, retail FW estimates worldwide, especially Canada, are much less available and robust than estimates at the household level (UNEP, 2021). Large grocery stores make up the majority of retail FW research and more are turning their attention to FW reduction initiatives. For example, ECCC (2019) looks at current actions by Canada's largest food retailers (e.g., Loblaw's Companies Limited, Save-On-Foods, Walmart Canada, etc.). These retailers are undertaking specific initiatives including setting corporate FW reduction targets and conducting waste audits to better inform their purchasing (ECCC, 2019). On the other hand, less evidence of FW reduction strategies is seen in small and medium-sized grocers in Canada (ECCC, 2019). Thus, this study aims to contribute to the knowledge of FW management practices of small grocers and to identify public policy interventions that target their FW reduction barriers.

Between consumers and food producers, food retailers occupy a pivotal position to influence behaviours in both directions (Filimonau & Gherbin, 2020). To illustrate, grocery stores use marketing and promotions to get consumers to purchase specific products or unnecessary quantities, and thus can affect consumer purchasing habits that drive the generation of FW. In the other direction, grocery stores inspect their products at time of receiving and reject back to their supplier items that do not meet their quality standards. Thus, grocery stores can drive the generation of FW upstream as well.

## **1.2. Research Objectives and Paper Structure**

In this study, I examine the policy problem of retail FW in Metro Vancouver, with a particular focus on small grocers. The research is divided into two phases. The first phase examines FW mitigation in foreign jurisdictions to answer the research question

(RQ1): what policy interventions are in place in other jurisdictions to mitigate FW at the retail level that can possibly be applied to small grocers in Metro Vancouver? The second phase examines select small grocers located in the Metro Vancouver region and aims to answer (RQ2): what are small grocers doing to mitigate their FW; and (RQ3) can practices implemented by large food retailers work in small grocery stores?

The structure of this paper is as follows. In chapter two, I provide context on the problem of FW in terms of scope, scale, impacts, and the regulatory framework for FW in BC and Metro Vancouver. In chapter three, I present my literature review on the causes of retail FW, existing mitigation practices, the established hierarchy for FW solutions, and I conclude the chapter with current retail FW management knowledge gaps. In chapter four, I explain my research design, while in chapter five, I summarize my research findings on FW policy instruments from my jurisdictional scan of France, Italy, the United Kingdom, and the United States. In chapter six, I present my two case studies of small Metro Vancouver grocers; in particular, I examine their current FW mitigation practices and policies, reception to potential FW policies, missed mitigation opportunities, and barriers. In chapter seven, I present three policy options aimed at mitigating retail FW in Metro Vancouver, which are based on the policy instruments identified from the jurisdictional scan and guided by the findings from my case studies. Policy option one requires food retailers to enter into food donation contracts and provide employee training on food donation guidelines. Policy option two involves reducing property taxes to food retailers that donate food. Policy option three involves a promotional campaign and grants for the Pacific Coast Food Waste Commitment, a voluntary agreement. Then, in chapter eight, I analyse these three policy options for their application to small grocers in Metro Vancouver, using the following objective and impact criteria: environmental sustainability, stakeholder compliance and acceptance, cost and administrative complexity. In chapter nine, I provide other matters requiring consideration and in chapter ten, I give my policy recommendations for the immediate future and medium term. Finally, in chapter eleven, I conclude with final thoughts on the policy problem of FW and propose future research areas to explore.

## Chapter 2. Background

### 2.1. Terminology

Across the literature, definitions of FW vary based on edibility, diversion destination (e.g., biofuel), or stages of the FSC (Food and Agriculture Organization of the United Nations [FAO], 2019). In academic literature, any food intended for human consumption but is discarded post-harvest is commonly referred to as 'food loss', or 'spoilage' (Filimonau & Gherbin, 2020; Grizzetti et al., 2013; Parfitt et al., 2010). However, the same definition is often used interchangeably for 'food waste' in general discussion. More recently, policy actors, such as the Food and Agriculture Organization of the United Nations (FAO) (2019) and the United Nations Environment Programme (UNEP) (2021), refer to 'food loss' as food discarded after production through to distribution, so as to distinguish it from food discarded in the later stages of the FSC, referred to as 'food waste' (Filimonau & Gherbin, 2020). This distinction is made to relate food losses to supply and inefficiencies in the FSC system, and FW to consumer behaviour and demand (Parfitt et al., 2010). FW based on consumer behaviour can be distinguished even further with the terms 'unavoidable' FW (e.g., bones, etc.) and 'avoidable' FW (e.g., plate leftovers, stale bread, etc.). This adds even greater complexity to terminology (Parfitt et al., 2010). For the purpose of this paper, both avoidable and unavoidable FW is covered under the definition used herein.

The lack of a universal definition creates complications in analysing and addressing the problem of FW, which creates challenges in collecting and comparing data across regions (Do et al., 2021). Recently, the FAO and UNEP have developed the first Food Loss Index (FLI) and Food Waste Index (FWI) to apply a consistent approach in measuring global progress towards SDG Target 12.3 (FAO, 2019). The FWI is a compound measure of total FW at the retail, food service, and household sectors, and does not disaggregate by specific commodities. In my study, I follow the definitions provided by the FWI to support a consistent approach in addressing the problem of FW, which is referred to herein as "food and the associated inedible parts removed from the human food supply chain at the retail, food service, and household levels" but does not include inedible parts intended for non-human food use (UNEP, 2021).

## 2.2. The Food Supply Chain (FSC)

Food intended for human consumption generally goes through the following stages: agricultural production; post-harvest handling, storage, and distribution; processing; further storage and distribution; and finally, consumption. Consumption is the final stage of the human FSC and includes various sectors including retail, food service, and household. Note that the human FSC is more complex than illustrated here and foods do not always follow a linear flow due to the involvement of multiple ingredients, by-products, and processors used in many of the foods that we consume today. However, the generic stages and flow of the human FSC are useful for the purpose of this study. (FAO, 2011)

Based on the definition of FW used herein, the scope of FW is limited to the consumption stage (Figure 1) and includes the retail, food service, and household sectors. However, it is important to note that although FW is limited to this final link of the FSC, many of the actors from the rest of the FSC influence the amount of waste generated in the consumption stage, since this stage is the final stage of the FSC and corresponds to actions and decisions made upstream.

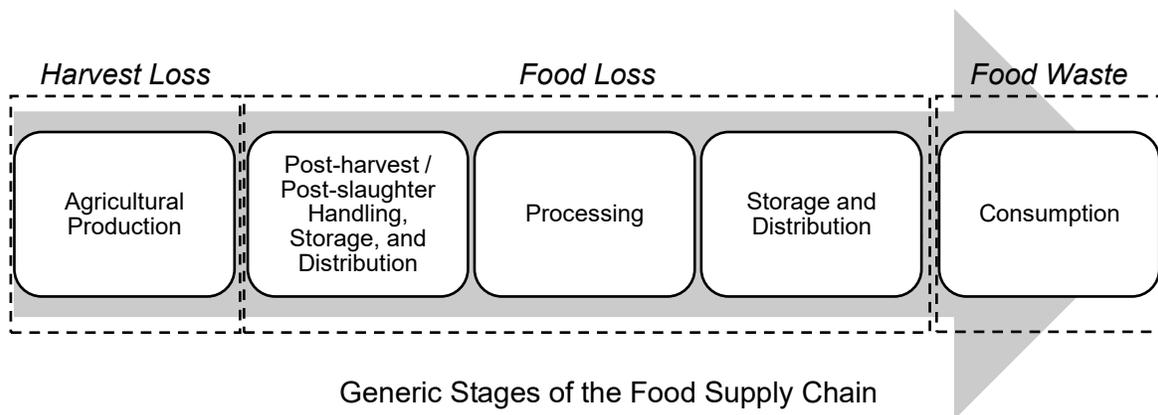


Figure 1. Boundaries of harvest loss, food loss and FW within the human food supply chain.

Note. Licensed as CC BY-NC-SA 3.0. Adapted from FAO. 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Box 2, p. 11, licensed under CC BY-NC-SA 3.0.

There are many ways that food can be lost or discarded throughout the human FSC due to internal and external factors (Parfitt et al., 2010). Internal factors refer to

practices such as harvesting and product handling. External factors refer to uncontrollable events such as weather and crop disease. Examples of harvest loss, food loss, or FW at each stage of the FSC are provided in Table 1.

Table 1. Examples of lost or discarded food within the human food supply chain, by terminology and stage.

<b>Terminology</b>	<b>FSC Stage</b>	<b>Examples</b>
<b>Harvest loss</b>	Agricultural production	Crop, seafood, poultry, or livestock disease and death; mechanically damaged crops; edible crops left unharvested
<b>Food loss</b>	Post-harvest / post-slaughter handling, storage, and distribution	Spillage; damaged or degraded foods from improper handling and storage
	Processing	Spillage; unsuitable foods for processing; rejected foods due to quality standards or improper processing or packaging
	Storage and Distribution	Spillage; damaged or degraded foods from improper handling and storage
<b>Food waste</b>	Consumption	Degraded foods due to improper storage or poor inventory management; plate scrapings; discarded foods due to poor food preparation technique; unconsumed or unsaleable foods discarded based on their Best Before Date (BBD)

(FAO, 2011; Parfitt et al., 2010)

### 2.3. The Scale of Food Waste

Calculating the scale of FW has been a challenge; however, with the introduction of the FWI and UNEP’s guidance on measuring and tracking our progress on FW, we are beginning to understand the scale of the problem. According to the 2021 FWI report, 931 million tonnes of FW is estimated to have been generated globally in 2019, of which 61% came from households, 26% from food service, and 13% from retail (Figure 2) (UNEP, 2021). This equates to wasting approximately 17% of total global food production annually (UNEP, 2021). In Canada, it is estimated that nearly 10 million tonnes of food were wasted in 2016 (total 35 million tonnes if including food loss), of which 14% (1.3 million tonnes) came from retail, 32% (3.1 million tonnes) from food service, and 54% (5.1 million tonnes) from household sectors (Figure 2) (Gooch et al.,

2019). In Metro Vancouver, it is estimated that nearly 35,000 tonnes of food were wasted in 2018, of which 51% (17,663 tonnes) came from the combined commercial / institutional sector and 49% (17,061 tonnes) from the household sector (Figure 2) (TRI Environmental Consulting, 2019). Due to the nature of the Metro Vancouver waste composition study, all commercial and institutional estimates were combined and not disaggregated by retail or food service. This presentation is not uncommon since household FW data, worldwide, is much more robust than any other sector. To demonstrate, the 2021 FWI report found 14 countries with high confidence in their FW estimates for the household sector, compared to 10 (mostly European) countries for the retail sector, and 9 countries for the food service sector. Canada was not listed as a country with high confidence in its FW estimates for the retail or food service sectors (UNEP, 2021).

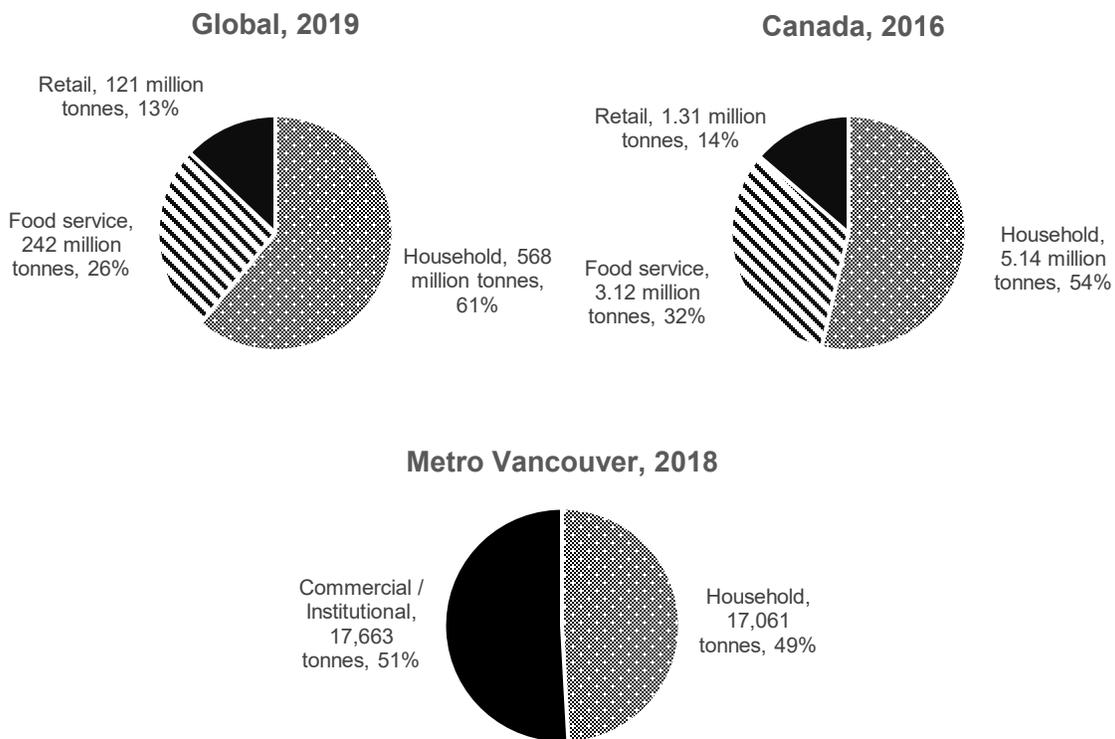


Figure 2. Estimated FW generated by region and sector. (Gooch et al., 2019; TRI Environmental Consulting, 2019; UNEP, 2021)

## 2.4. Impacts of Food Waste

Access to food is a fundamental human right and integral to culture and society. Food has significant environmental, economic, and social consequences when wasted. The consequences of FW are not localised to dump sites, but rather are far-reaching when considering emission of GHGs and contribution to climate change. Food waste has a significant opportunity cost and this section demonstrates its impacts on the environment, economy, and food security.

### 2.4.1. Environment

Food waste has a significant impact on the environment due to the intense use of resources in food production, and its GHG emissions during decomposition. Of the main GHGs driving global warming, carbon dioxide (CO<sub>2</sub>) is the most commonly monitored; however, the decomposition of FW in landfills generates methane, a GHG with the warming potential 25 times that of CO<sub>2</sub> (ECCC, 2021). To account for this, methane and other GHG emissions are generally converted into carbon emission equivalents based on their warming potential and expressed in megatonnes of CO<sub>2</sub> equivalent (Mt CO<sub>2</sub>e).

To illustrate the scale of FW and its carbon footprint, the FAO in 2013, using 2011 world data, estimated that food loss and waste have an annual carbon footprint of approximately 3,600 Mt CO<sub>2</sub>e (excluding GHG emissions from land use change [e.g., deforestation] or 4,400 Mt CO<sub>2</sub>e including land use change) (Scialabba, 2015). This places food loss and waste in the range of 8-10% of global GHG emissions annually and would be the third biggest source of greenhouse gas emissions in the perspective of national emissions (Figure 3) (Climate Watch, 2021; ECCC, 2021; UNEP, 2021).

Reducing surplus food and FW can improve the efficiency of the food production systems while also decreasing GHG emissions, of which benefits would be felt globally through fewer extreme weather events and crop disasters. Furthermore, reducing FW specifically at the point of consumption can significantly relieve the impact on the environment as it represents the product of GHG emissions accrued throughout the entire FSC. Use-efficiency of energy, land, and water resources would be improved since more of these inputs would be used as intended by consumers rather than wasted in landfills. (FAO, 2019)

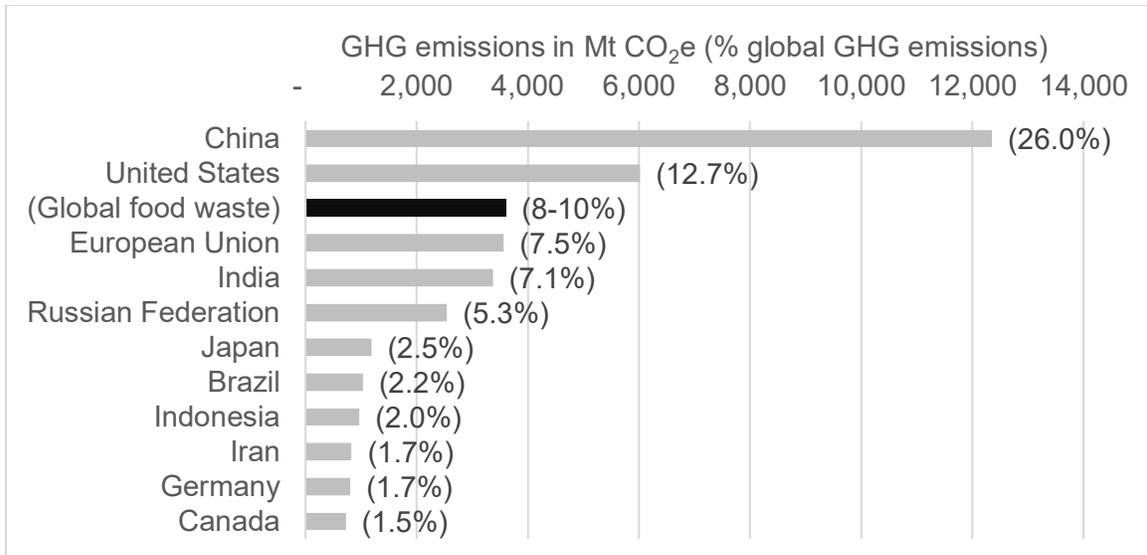


Figure 3. Comparison of GHG emissions from global food loss and waste against top GHG emitting regions, 2018. Excludes GHG emissions from land use change. (Climate Watch, 2021; ECCCC, 2021).

## 2.4.2. Economy

FW represents a deadweight loss to society due to its inefficient use of resources and improperly allocated supply to its consumers. The value of avoidable food loss and waste throughout the human FSC in Canada is estimated to be nearly \$50 billion, based on the 2016 retail value of food (Gooch et al., 2019). In BC, it is estimated that \$516.5 million worth of food is wasted annually in the retail sector alone and is equivalent to twice the value of estimated gross profit (BC Ministry of Environment and Climate Change Strategy [BCMECCS], n.d.).

Based on findings from the BC Ministry of Environment and Climate Change Strategy, reducing FW can potentially result in 2-3% savings for the average grocery store and create a strong business case for waste reduction (BCMECCS, n.d.). These savings can potentially be passed on to the consumer allowing consumers to share the benefit as well. However, if retail prices are reduced to the extent that it lowers the price of supplier outputs upstream of food retailers, then this may result in suppliers being worse off (FAO, 2019). Still, there is a strong case for reducing FW to achieve the environmental gains discussed above and to alleviate the food security as discussed below.

### **2.4.3. Food Security**

Food security refers to the ability to reliably consume a diet of adequate quantity, of nutritious quality, and of culturally acceptable foods, whereas, food insecurity refers to the inability or uncertainty to do so (Health Canada, 2010). Recent data collected during the COVID-19 pandemic shows that almost 15% of Canadians (excluding Indigenous populations living on reserve) live in a food-insecure household (Statistics Canada, 2020). With nearly 10 million tonnes of food wasted annually in Canada, the problem is not in the production of food but rather in its supply allocation and accessibility. Mitigating FW can alleviate food insecurity through the redistribution of uneaten and unwanted, yet nutritious foods, to those in need through donations to food banks and soup kitchens. This will not solve the problem of food insecurity as it is an income-rooted problem; however, FW mitigation strategies such as food donation play an important supporting role in providing food security.

To illustrate the role that food donation plays, Second Harvest, Canada's largest food recovery organisation, mapped the country's 'invisible network' of charitable food redistribution across the country in 2021, a first of its kind for Canada. The study found that there are four times as many charitable organisations distributing food as there are grocery stores in Canada. By dollar value, these organisations together distributed \$33 billion in 2020, which would make them the second largest grocery store in Canada (Nikkel et al., 2021). Unfortunately, with the increasing demand on these organisations especially during the pandemic, the report notes an ongoing supply short fall. According to Food Banks Canada, over 5,000 tonnes of food is provided annually through its Food Retail Program, where national retailers like Loblaws Companies Limited and Walmart are connected with local food banks (Food Banks Canada, n.d.). However, affordable food supply is an ongoing concern that will likely worsen without public intervention as Canada's population continues to grow and food prices rise. This presents another opportunity for food retailers of all sizes to play a role and support their local food charities through donation.

## **2.5. Regulatory Context**

At present, FW in Canada is not regulated at the federal level and remains within provincial, regional, and municipal jurisdictions. The nation's first ever *Food Policy for*

*Canada*, introduced in 2019, identifies FW reduction as one of four key actions to take between 2019 to 2024 but aims to guide, not regulate, food-related decisions and actions by the public, private, and non-profit sectors ([Agriculture and Agri-Food Canada \[AAFC\], 2019](#)). This section lays out the regulatory framework for FW in BC and Metro Vancouver.

### **2.5.1. British Columbia**

In the province of BC, waste, including FW, is governed by the *Environmental Management Act*. The legislation requires all regional districts to submit, for approval by the minister, a solid waste management plan covering collection, recycling, composting, and disposal. The plan is expected to be based on the principles of zero waste and the circular economy, and in support of the province's solid waste disposal target rate of 350 kg per person by 2020 ([BC Ministry of Environment and Climate Change Strategy, n.d.](#)). This target was set in 2013 but not legislated, and no FW or organic waste reduction targets have been set by the provincial government yet. Waste composition studies have shown that a large share of the waste generated in BC comprises of FW (19%), second only to non-degradable waste (39%) ([ECCC, 2020](#)), and points to FW as a strategic category to target for diversion from landfills and reduction of GHG emissions.

One method of mitigating FW is through food donation and in BC, this is encouraged via the *Food Donor Encouragement Act*, which works to limit donor liability. This act provides legal protection to businesses that donate or distribute food in good faith. Food that has been adulterated or is unfit for human consumption is, of course, not protected and is governed provincially by the *Food Safety Act* and federally by the *Food and Drugs Act*. In addition, the provincial *Food Premises Regulation* outlines the food safety requirements for food establishments such as food retailers and distributors; however, food banks are exempt. To provide further support to donors and non-profit food distribution organisations on food donation safety, the *Industry Food Donation Guidelines* was developed by the BC Centre for Disease Control. Taken together, businesses in BC have the legal and technical support in place to encourage the donation of safe food that would otherwise go to waste.

Furthermore, the provincial *Income Tax Act* offers a tax credit, known as the BC Farmers' Food Donation Tax Credit, for farmers and farming corporations that donate

certain provincially grown agricultural products to registered charities. The credit is non-refundable and is equivalent to 25% of the eligible amount of qualifying gifts for the tax year. This financial incentive encourages the donation of raw commodities by farmers to organisations such as food banks or school meal programs but only farmers are provided this unique food donation tax credit. Expanding this tax credit to other food industry sectors that also donate food, such as grocery stores, could be explored as a potential market-based solution to increase food recovery and mitigate FW.

## **2.5.2. Metro Vancouver**

In the regional district of Metro Vancouver, FW is managed as part of organic waste within the *Integrated Solid Waste and Resource Management Plan (ISWRMP)*. The plan included targets to reduce waste per capita to 90% or less of 2010 volumes and to increase the regional waste diversion rate to a minimum of 80% by 2020 (Metro Vancouver, 2010). The ISWRMP also includes a strategy to ban all compostable organics from disposal in landfills, which came into effect in 2015 for all 21 member municipalities. The organics disposal ban is enforced through the *Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Bylaw* and, as a result, has seen a decrease in the disposal of compostable organic waste from an average of 150 kg per capita in 2013 to 103 kg per capita in 2015 (Tetra Tech, 2016).

Waste composition studies show that the Metro Vancouver ‘commercial and institutional’ sector continues to dispose compostable organics as a greater share of its total waste compared to the other sectors (single-family residences, multi-family residences, and residential drop-off): 21.6% compared to the average 19.8% in 2020 (Micro Testing and Engineering, 2021; TRI Environmental Consulting, 2019). This points to the potential for further action in the commercial sector to reduce organic waste, which mostly consists of FW. Now, in 2022, the regional district is updating the ISWRMP once more. Initiatives for consideration include the feasibility of providing commercial organics transfer service at its regional facilities, the feasibility of partnerships to process FW, and the continuation of FW awareness campaigns aimed at the residential sector.

## Chapter 3. Literature Review

### 3.1. Causes of Food Waste at Retail

In a systematic literature review spanning nearly a decade on the causes of FW and practices for reduction at the retail level, de Moraes et al. (2020) identified 34 causes of FW in the retail sector (Appendix A). Content analysis revealed that the major causes of FW are related to operational procedures, metrics, and materials; though, machine and environment-related causes are identified as well. Commonly cited operations-related causes of FW at retail are stringent product quality standards, poor inventory control, and lack of employee training on waste prevention, whereas commonly cited metrics-related causes are inadequate demand forecasting, stocking excess product, and lack of waste measurement. These issues involve company attitudes towards ensuring product quality and availability for customers and attitudes on FW. As for material-related causes, inadequate packaging and short shelf life directly affect the quality of foods and their degradation, and can be exacerbated by any of the other causes of FW throughout the supply chain. Furthermore, confusion between best before dates (BBDs) based on quality and expiry dates based on safety can cause food to be wasted when it is still safe for consumption. BBDs are voluntarily set by brand owners and manufacturers to guarantee product quality. Due to this confusion for product safety, there is potential to reduce FW through increased consumer education or explicit labelling to inform consumers that the BBD does not indicate the date when the product is no longer safe to consume. Problems with the cold chain, transportation equipment, and storage comprise the majority of machine-related causes of FW at retail. A break in the cold chain, either due to malfunctioning equipment or inappropriate storage and handling, creates quality and safety risks, which then determine the food's outcome. Environment-related causes are factors external to the FSC and include restrictive laws on trade. For example, stringent trade regulations can prevent the market of nutritious foods solely due to labelling requirements. Furthermore, restrictive food safety laws can also inhibit food recovery for donation or for alternative purposes. Public policy has the greatest potential to address operations-, metrics-, and environment-related causes rooted in behaviour and legislation. In this paper, these causes are taken into strong consideration for the policy options chosen. (de Moraes et al., 2020)

### 3.2. Hierarchy of Food Waste Solutions

A hierarchy for the management of surplus food and FW was developed by [Papargyropoulou et al. \(2014\)](#) and has been adopted by numerous organizations (e.g., Love Food Hate Waste, Second Harvest Food Rescue, etc.) and local and federal regulators (e.g., City of Vancouver, United States Environmental Protection Agency, European Commission, etc.). The Government of Canada has adopted and modified this hierarchy as part of its approach in developing Canada's first food policy and it helps identify and prioritize solutions for addressing food loss and waste (Figure 4) ([ECCC, 2019](#)).

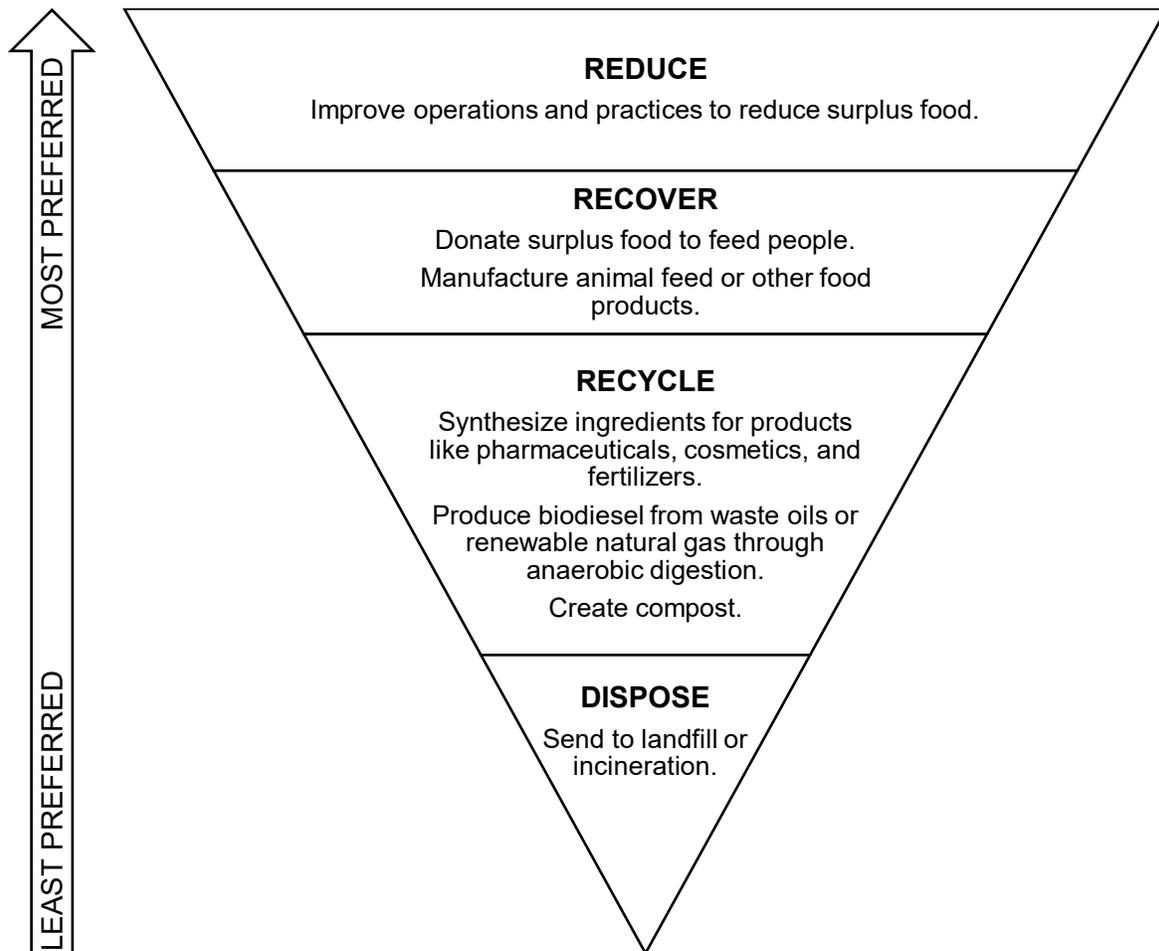


Figure 4. Hierarchy of solutions to address food loss and waste.

*Note.* Text from Environment and Climate Change Canada. (2019). *Taking stock: Reducing food loss and waste in Canada.* p. 2.

The food waste hierarchy is organized by the ability of the solution to make use of the food at its maximum energy and nutritional value. Solutions with the ability to do this are preferred and prioritized. Beyond prevention, the most preferred solution to address FW is to reduce it by improving operational practices. For any FW generated after that, the next preferable method is recovery and reuse, such as donating food to feed people, or manufacturing animal feed. For FW that can no longer re-enter the human FSC, the preferred solution is to recycle it for other purposes such as synthesizing ingredients for cosmetics, producing biodiesel, and creating compost. The last method of dealing with FW is to dispose of it by sending it to landfills or incineration. This is the least preferred method as it loses both the energy and nutritional value of the food as well as creating unnecessary pollution. (ECCC, 2019)

### **3.3. Existing Food Waste Mitigation Practices at Retail**

De Moraes et al. (2020) also identified practices in the academic literature for reducing FW at the retail level. The most cited practices are related to improving operational procedures, equipment, and product packaging and labelling (Appendix A). With regards to improving operational procedures, large food retailers in Canada are taking actions ranging from simple to complex, such as installing signage near waste bins and training staff to improve produce displays, to setting FW reduction targets and reviewing product specifications to allow more produce into their stores (ECCC, 2019). In 2018, for example, Walmart Canada set a zero FW target by 2025, in accordance with the Zero Waste International Alliance standards (90% diversion from landfills and incinerators) (Walmart Canada, 2018). More recently in 2021, Loblaw Companies Limited set a target to reduce their FW by 50% by 2025, measured against their 2016 baseline results (Loblaw Companies Limited, 2021). Some retailers are also introducing employee challenges and reward systems to increase FW awareness (ECCC, 2019).

Mitigation practices that involve equipment at the retail level to improve the cold chain and FW measurement include the use of technology and sensors for food quality and safety control during transport and storage, and investing in waste-reduction oriented operational systems (de Moraes et al., 2020). Some retailers are taking this

further and conducting waste audits to control their overstocks, inform their purchasing, and to report on their sustainability and waste reduction targets (ECCC, 2019).

When it comes to reducing FW through practices of improving the product itself, food retailers look to improve the shelf life of their products through innovative product packaging and labelling (de Moraes et al., 2020). Product packaging technologies can help extend product shelf life and allow more time for foods to reach consumption. In addition, education around product labelling plays an important role as it can prevent retailers and consumers from disposing of the product without attention to the product's condition.

### **3.4. Knowledge Gaps in Food Waste Management by Small Grocers**

The share of the food retail market is largely consolidated in Canada, with “5 major stores commanding 80% of the market” (ECCC, 2019, p. 4). However, according to the establishment size classification by Statistics Canada, small establishments make up the majority of grocery stores in Canada (Innovation, Science and Economic Development Canada [ISED], 2021). In BC, small establishments (5-99 employees) make up 54.0% of the grocery store distribution, followed by micro establishments (1-4 employees) (28.1%), medium-sized establishments (100-499 employees) (17.8%) and large establishments (more than 500 employees) (0.1%) (ISED, 2021). So, although it is critical that there are FW reduction initiatives underway within large food retailers, there is a considerable opportunity for small grocery stores to make a substantial impact.

While more evidence on large food retailers and their FW mitigation practices is emerging through their corporate sustainability reports, evidence of FW mitigation and FW estimates among small grocers has still not been clearly established. As already demonstrated, there is limited data on retail FW estimates in many countries, Canada included. Thus, in this paper, I attempt to contribute to the knowledge and literature in this policy area by examining FW management by small grocers in Metro Vancouver and the retail FW policies in France, Italy, the United Kingdom, and the United States.

## **Chapter 4. Methodology**

This study is primarily inductive with a specific methodology for each of the two research phases. In addition, I conduct a literature review for background knowledge, which informed both research phases. For phase one, I use a jurisdictional scan to gather data for the purpose of answering RQ1, regarding policy interventions that have the potential to be applied to small grocers. For phase two, I use case studies to answer RQ2 and RQ3 that are related to the current status of FW mitigation at small grocers and whether mitigation practices employed by large food retailers are appropriate for small grocers. This phase also involves a thematic analysis of the findings for barriers specific to small grocers, their missed mitigation opportunities, and promising FW policies.

### **4.1. Jurisdictional Scan**

My methodology for researching FW management policies aimed at food retailers entailed the SFU Library Catalogue using the following keywords: FW, retailers, grocery, small grocer, reduction target, organic waste policy, FW policy, FSC, and FW legislation. Based on the information gleaned, I selected four foreign jurisdictions for study: France, Italy, the United Kingdom (UK), and the United States (US); for reasons including their high confidence of FW estimates ([UNEP, 2021](#)), diversity of policies on the fight against FW, and potential for application to small food retailers. The jurisdictional scan also involved querying similar terms in Google to search the grey literature (i.e., policies, reports, fact sheets, program websites) from intergovernmental organizations, the business sector, non-governmental organizations, and local and state government websites. No specific years were excluded from the search queries.

### **4.2. Case Studies**

#### **4.2.1. Interviews**

To research what small grocers in Metro Vancouver are doing to mitigate their FW and whether mitigation practices implemented by large food retailers would work, I conducted interviews with grocery store employees. The inclusion criteria for participants were owners or employees of brick-and-mortar grocery stores engaged primarily in the

retail of food for human consumption, with up to 100 employees, and located in Metro Vancouver. Non-employees, online-only grocery stores, grocery stores with 500 employees or more, or stores located outside of Metro Vancouver were excluded. Participants were selected by convenience sampling in consideration of travel limitations, holidays, and availability.

The interviews were semi-structured, based on an interview guide that I developed on topics covering current FW mitigation practices and their drivers, perceptions, and barriers; plus, reception to potential FW policies (see Appendix B for interview transcripts). They were conducted via telephone during the months of December 2021 and January 2022. Individual interview durations varied in length but were no more than 30 minutes and were electronically recorded. For confidentiality, participant names were not recorded and interview data was coded. Interviews were transcribed and loaded into NVivo 12, a software program, for coding and qualitative analysis.

#### **4.2.2. On-Site Observations**

Complementary on-site grocery store observations were conducted during the same timeframe as the interviews. Grocery stores were selected based on the workplace of the interview participants. The duration of each on-site grocery store observation varied in length but were no more than 30 minutes. Due to potential issues with occupational health and safety regulations, only areas open to the public were observed within the stores. In addition, on-site observations had to comply with current provincial health orders related to the COVID-19 pandemic. Observations were guided by the participant where present, by the data collected from the interviews, and by my past work experience in food safety inspections and auditing.

### **4.3. Limitations**

While the case studies provide data on small grocers in Metro Vancouver and their FW management practices, they are subject to the standard limitations of qualitative research, and as such, care must be made when interpreting the findings. First, the interviews were semi-structured, and although based on an interview guide, there is a level of subjectiveness in probes asked and in the interpretation of the data.

However, this was minimized through self-awareness and acknowledgement of my position. Second, this study contains a limited number of grocery stores and perspectives. Resource and time limitations resulted in only two interviews and two grocery store observations. Third, there may be selection bias. Convenience sampling may have generated grocers who were less affected by (a) the supply challenges due to recent extreme weather events (i.e., BC wildfires, the Pacific Northwest floods, December 'arctic flow'), (b) worker shortages and challenges during the pandemic, and (c) the religious holidays in December. Therefore, this study does not aim to generalize these findings to the whole population of small grocers. It presents an in-depth perspective that uncovers some of the underlying views within the sector.

## **Chapter 5. Jurisdictional Scan Findings**

This chapter presents my research findings on FW reduction policies implemented in France, Italy, the UK, and the US, for their high confidence of FW estimates, diversity of policies on the fight against FW, and potential for application to small food retailers. I identified a range of government policies among the regions within the scope of this study and categorized them as regulatory instruments, voluntary agreements, or fiscal instruments.

### **5.1. Regulatory Instruments**

#### **5.1.1. Legislated Food Waste Hierarchy, Food Waste Reduction Targets, and Assumption of Responsibility**

France was the first in the world to take a bold legislative approach to combat FW with its “Garot Law”. In force since 2016, the law aims to address FW across the FSC within its borders. It entrenches an order priority, similar to Canada’s hierarchy, in which FW shall be tackled by food producers, processors, distributors (includes retailers), consumers, and associations. It also includes a definition for FW: any food intended for human consumption, which, at a stage in the food chain, is lost, thrown away or degraded. Under this law, all parties throughout the FSC are legally responsible for FW; it raises their awareness of the issue, and standardizes what constitutes FW. More recently with the enactment of the circular economy law and the fight against FW, France now has FW reduction targets legislated within its Environment Code. The code states that FW shall be reduced by 50% by 2025, compared to its 2015 level in the areas of food distribution, which includes retail, and collective catering.

In the same year, Italy introduced the “Gadda Law” to reduce FW at each of the stages of production, processing, and supply of food. A hierarchy for FW is also included, however, it differs by limiting negative impacts on the environment through the extension of the life cycle of products; and requiring awareness-raising activities aimed at the younger generations. The Gadda Law also entrenches a definition for ‘food waste’, ‘food business operator’, and ‘donor organisations’. This is done to clarify that donor organisations, such as food banks, are not treated as food business operators for the purpose of this law. It also supports an earlier law, Law No. 155/2003, known in

English as the “Good Samaritan Law”. It contains an article to relieve charitable donors from liability arising from food safety after the food has been donated.

Similarly, in the US, the federal US *Bill Emerson Good Samaritan Act* aims to limit donor liability for businesses. As well, FW reduction targets are not federally legislated but instead organic waste reduction targets are set in some state-level laws. For instance, California has one of the strictest organic waste recycling laws for businesses in the country, which requires all businesses to reduce their organic waste production to under 2 cubic yards (1.5 cubic meters) per week (Recycle Track Systems Holding, 2021). California’s Senate Bill 1383 also includes the following organic waste reduction targets: reduce disposal of organic waste by 75% by 2025, based on 2014 levels. Compared to general waste reduction targets, these specific policies generate greater force and measure in the fight against FW. In general, Italy and the United States take a softer policy approach compared to France and its anti-waste policies, by lowering legal barriers to FW recovery by businesses. With their food donation laws legally recognizing donor organisations as the final consumer of the FSC, it prevents food bank users from filing lawsuits against the food donors (O’Connor et al., 2014).

No evidence of nationally legislated FW reduction targets or FW hierarchies were found in the UK; however, goals to reduce organic / FW and guidance on applying the FW hierarchy exist in various national programs. For example, FW reduction targets are included in the Department for Environment, Food & Rural Affairs’ (DEFRA) resources and waste strategy, while the FW hierarchy is embedded in statutory guidance.

### **5.1.2. Mandatory Food Donation and Food Waste Awareness Education**

In France, large supermarkets are mandated to donate unsold food that is still fit for human consumption. This is enabled under the Environment Code, which obliges all food retailers with sales premises greater than 400 square meters, to enter into food donation contracts with authorised charitable organisations. The code specifies that food to be donated must be transferred to the donor organisation not more than 48 hours after their expiry date for food safety and to qualify as a donation for tax purposes. In addition, food retailers subject to mandatory food donation are required to have a quality management plan with respect to donations and communicate it to their food donation

recipients. This quality management plan must include raising employee awareness on FW and food recovery, and employee training on the company's donation operations. Furthermore, the confusion around BBDs is addressed by permitting these labels to be accompanied by a statement to inform individuals that the product remains edible after the specified date. This command-and-control type policy stops short of legislating minimum amounts of food that must be donated. This avoids penalising grocers who properly manage their inventories and practice food waste reduction.

Food donation is also mandatory in select states within the US. For example, in New York, its *Excess Food Act*, in force since 2021, requires supermarkets greater than 10,000 square feet (929 square meters) to donate excess food to charitable organisations at some frequency. California's Senate Bill 1383 also requires grocery stores equal to or greater than 7,500 square feet (697 square meters) to implement food recovery practices starting in 2022. Like France, no donation amount is specified under these laws.

In Italy, food donation is not mandatory. Instead, consumer education is mandatory as per the Gadda Law. To raise general awareness of the negative effects of FW, the responsible ministries and the public radio / television / multimedia must carry out national education campaigns and ensure sufficient allocation of broadcasting hours, respectively, to promote FW reduction behaviours and initiatives (Vagué, 2022).

### **5.1.3. Banning the Destruction of Unsold Food**

Second to mandatory food donation contracts and as a means to ensure that FW is recovered in France, the Garot Law ensures that, directly upstream of food retailers, food distributors engage in food donation by prohibiting contracts that attempt to invalidate donation, such as for reasons related to products with a distributor's label (Vagué, 2022). Beyond that, the law makes it illegal for food sector distributors, wholesale trade operators, and agri-food industry operators to deliberately make unsold food inedible; in effect, banning the destruction of unsold food. No evidence of similar legislation was found elsewhere, though bans exist for food scraps in landfills.

#### 5.1.4. Sanctions

In France, failure to comply with the country's fight against FW is punishable by hefty fines: up to 0.1% of the establishment's annual sales turnover. The business is then subject to an additional penalty of having to publish the notice of the fine. Violations in the US are also subject to minor administrative penalties or fines. For example, in New York, the penalty under the *Excess Food Act* may not be more than US\$250 for the first violation and up to US\$1,000 for subsequent violations after the second. As Italy's approach is to encourage food donation rather than penalize, there are no sanctions involved when food is not recovered.

## 5.2. Voluntary Agreements

The UK is perhaps the best example to examine for a voluntary approach to FW reduction in the retail sector. The majority of voluntary FW reduction initiatives in the UK are led by the Waste and Resources Action Programme (WRAP), a registered charity supported by funding from various government organisations including the UK DEFRA and the EU. WRAP works with UK retailers and brands to meet targets set under the Courtauld Commitment, its flagship series of voluntary agreements with the food and drink sector to reduce FW and achieve global environmental goals.

Courtauld Commitment 1 (2005-2009) was the first of the series and placed household food and packaging waste on the agenda for over 40 signatories including major retailers, manufacturers, and brand owners. WRAP and the signatories negotiated the first target "to help reduce the amount of food the nation's householders throw away by 155,000 tonnes by 2010, against a 2008 baseline" ([WRAP, 2010, p. 1](#)); and worked together using tools, support, guidance, and forums provided by the former to develop solutions throughout the entire FSC and to measure FW. Renewals of the Courtauld Commitment occurs every few years, which grows in signatories and introduces more ambitious targets aimed at the manufacturing and retail sectors. Courtauld Commitment 2030 is the latest agreement and its targets and timeline are better aligned with UN SDGs. The current target is set "to deliver against UN SDG 12.3: a 50% per capita reduction in food waste by 2030 vs the UK 2007 baseline (covering manufacture, retail, hospitality and food service, and household)" ([WRAP, n.d., para. 3](#)). WRAP continues to

be a leader in providing FW reduction and awareness tools, and sharing best industry practices gleaned through case studies throughout the FSC.

Furthermore, Courtauld Commitments have become the basis for voluntary agreements elsewhere in the world, such as the National Pact Against Food Waste, launched in 2013 in France; the Zero Waste Charter, launched in 2013 in Italy; and the Pacific Coast Food Waste Commitment (PCFWC), formerly known as the West Coast Voluntary Agreement to Reduce Wasted Food, launched in North America in 2020. The PCFWC is led by the Pacific Coast Collaborative, an international group of jurisdictional partners including British Columbia, Washington, Oregon, and California. The PCFWC currently has nine signatories consisting of retailers and manufacturers, and is based on signatories committing to “support and play a part in achieving the West Coast’s regional goal of reducing and preventing wasted food by 50% by 2030” and to “annually measure and report food waste reduction data” ([Pacific Coast Collaborative, n.d., p. 4](#)).

### **5.3. Fiscal Instruments**

France’s General Tax Code offers one of the highest financial incentives for food donation among European nations ([O’Connor et al., 2014](#)). This enables companies that donate food, and even companies that deliver and store food donations, to receive a tax credit of 60% of the donation or service value, up to 0.5% of the company’s annual turnover. If, due to this cap, the full tax break was not used in the first year, the tax credit may continue for the next five fiscal years, after taking into account payments made for each of these fiscal years. This provides a direct financial incentive for grocery stores to donate surplus food.

Similarly, in the US, the Internal Revenue Code provides an enhanced tax deduction at the federal level to eligible companies that donate food to qualified non-profit charitable organisations. The code allows for a tax reduction that is “the lesser of (a) twice the basis value of the donated food or (b) the basis value of the donated food plus one-half of the food’s expected profit margin (if the food were sold at its fair market value)” ([ReFED, 2022, para. 3](#)), up to 15% of the company’s taxable income for the year. The following *Protecting Americans from Tax Hikes Act* expanded the company eligibility criteria for the enhanced tax deduction to all businesses, making permanent the food donation tax credit to all businesses ([Buzby, 2021](#)). In addition, several states offer state

tax incentives through deduction (Arizona) and credits (California, Colorado, Oregon, etc.) too.

Companies that donate food to special status donor organisations in Italy are also offered financial incentives through tax deductible donations plus municipal waste tax reductions. According to Decree 35/2005, a company may receive a full deductible up to 10% of the company’s taxable income, but maximum €70,000 per year, when donations are made to a non-profit charitable organisation that specifically recovers and distributes surplus food, which are organisations given the special status of O.N.L.U.S. (Organizzazioni non Lucrative di Utilità Sociale [Non-Profit Organizations of Social Utility]). Furthermore, in all municipalities in Italy, grocery stores are subject to a waste tax based on the square footage of the store’s total sales area, regardless of the amount of waste it generates (Franco & Cicatiello, 2021). However, the Gadda Law enables municipalities to apply a reduction to the waste tax in an amount proportional to the quantity of food donated for establishments participating in food donation, which provides further incentive for food recovery.

## 5.4. Summary Table

My research from the jurisdictional scan identified a range of current government policies from France, Italy, the UK, and the US that aim to reduce FW in the retail sector. Tax incentives and voluntary agreements appear to be more applicable to small and medium-sized grocers based on the tools and resources they can offer. Strict regulation is less applicable, such as in France’s mandatory food donation where it only applies to large supermarkets over a certain size.

*Table 2. Summary of policy instruments currently in use in France, Italy, the United Kingdom, and the United States that aim to reduce FW in the retail sector.*

Jurisdiction	Instrument Identifier	Type of Instrument	Description
<b>France</b>	General Tax Code	Fiscal	Provides tax credits to businesses that donate food to non-profit charitable organisations.
	Law No. 2016-138 (Garot Law)	Regulatory	Entrenches a definition and hierarchy for FW; mandates food donation by

<b>Jurisdiction</b>	<b>Instrument Identifier</b>	<b>Type of Instrument</b>	<b>Description</b>
			supermarkets; bans the destruction of unsold food; and codifies FW related sanctions.
	Law No. 2020-105 (Law on the fight against food waste and the circular economy)	Regulatory	Entrenches FW reduction targets in legislation.
<b>Italy</b>	Decree 35/2005	Fiscal	Provides tax deductions to businesses that donate food to O.N.L.U.S.
	Law No. 155/2003 (Good Samaritan Law)	Regulatory	Limits food donor liability.
	Law No. 166/2016 (Gadda Law)	Regulatory	Entrenches a definition and a hierarchy for FW; and mandates raising FW awareness of consumers and institutions.
		Fiscal	Enables municipalities to provide waste tax reductions to establishments that donate food.
<b>United Kingdom</b>	Courtauld Commitment	Voluntary agreement	Establishes agreement between signatories to meet FW reduction and other environmental targets.
<b>US</b>	Internal Revenue Code and <i>Protecting Americans from Tax Hikes Act</i>	Fiscal	Provides enhanced tax deductions to businesses that donate food to non-profit charitable organisations.
	Law 104–210 ( <i>Good Samaritan Act</i> )	Regulatory	Limits food donor liability.
	Pacific Coast Food Waste Commitment	Voluntary agreement	Agreement between parties to meet FW reduction targets.

## **Chapter 6. Case Studies**

### **6.1. Case Study 1: Family-Owned and Operated Small Specialty Grocery Store**

The first case study is of a small specialty grocery store, employing under 10 associates and located in a commercial district of Vancouver. The store is one of multiple locations across Metro Vancouver and is family-owned and operated. The store sells a variety of foods including, but not limited to, fresh produce, dry and canned foods, frozen foods, meats, and dairy products, with a speciality in ethnic foods. The business sells both in-store and online; however, this study focuses only on the one in-store operation. The findings below are the results of in-store observations and an interview from the perspective of the Assistant Manager.

#### **6.1.1. Food Waste Mitigation Practices: Discounting, Employee Training, Organic Waste Sorting, and Bulk Bins**

The primary food recovery practice in place at the store is the common business practice of discounting perishable and non-perishable foods near their end of shelf life. Every morning, leftover produce on display that visually appears to be nearing their end of shelf life is packaged in approximately five-pound bags and placed on clearance for \$1. In addition, when employees notice that a canned food or product packaged in a jar is within approximately six months of its BBD, they reduce the price and place it on sale.

*“If we reduce the price, we sell them before they get expired.”*

In order to do this, employees receive hands-on training on inventory rotation, product quality standards, and when products should be discounted (e.g., cosmetic blemishes). In order to extend product shelf life, which can help prevent FW, employees are trained on how to store and display produce, specifically which fruits and vegetables require refrigeration and which do not.

In addition to employee training, which is informal with no written training manuals or procedures, in-store observation revealed that in normal times, a selection of food products is provided in bulk bins for customers to purchase the exact quantities needed, rather than overbuying and having excess food go to waste. Unfortunately,

public health policies were implemented to mitigate COVID-19 surface transmission so this practice is currently not allowed and prepackaged quantities are instead provided for safety. This policy should be removed as data shows that surface contamination is not a major source of COVID-19 transmission (National Center for Immunization and Respiratory Diseases, 2020).

In terms of recycling to divert FW from entering landfills, the store practices organic waste sorting. During training, employees are taught to separate organics, cardboard, and general garbage. Any unsold clearance produce no longer edible is placed in the organics bin for compost. In Vancouver, food scraps are banned from the general garbage stream, so it is common for businesses to sort and separate their organic waste.

Overall, FW recovery and recycling are the most utilised types of mitigation methods at the store; however, it does not appear that the store practices the hierarchy of FW solutions. Food donation does not take place and no other FW reduction practices aside from employee training were highlighted during the interview or observed in-store.

### **6.1.2. Drivers and Perceptions of Reducing Food Waste: Cost Savings and Societal Benefits**

The main driver for mitigating FW at the store is the cost savings to the business. By selling the clearance bags of produce, rather than disposing of them, the store can make some money, rather than write them off completely.

*“We prefer to make the \$1 bags so people can buy it.”*

When a significant amount of unsold clearance bags is present (e.g., bulk bins), food donation is perceived as potentially helpful to the store. In addition, if the store were to donate food, it is perceived as a positive societal action and “good for the people”.

*“If we donate that, it should be good for the people who we donate it to.”*

Despite this, unsold clearance bags are discarded in the organic bins and hauled away. For small grocers similar to this case study, it is imperative for policies to be designed in a way that trigger these drivers in order to gain their support.

### **6.1.3. Reception to Potential Food Waste Policies**

Three potential FW policies were shared with the participant to better understand potential stakeholder impacts. The findings below reveal the support or feasibility for each and briefly touch upon the barriers faced by the store. Note, three other potential FW policies that were prepared as part of the interview guide were not shared with the participant based on the barriers identified throughout the interview.

#### ***Measuring and Tracking Food Waste***

Measuring and tracking FW would be a major challenge for the store and employee competency was identified as a key barrier.

*“Challenges would be the employees, actually, because most of the employees don’t know English... it’s hard to explain to them sometimes.”*

Language barriers exist between the employees and the trainer so training on complex procedures such as measuring and tracking FW would not be feasible. However, the participant did express support for technology-assisted tracking and measurement.

*“I think it should be easier to do it that way. To keep [track of] it from person to person is pretty hard. If we use technology, of course it’s helpful.”*

#### ***Food Recovery and Distribution via Mobile Applications***

In contrast to the previous FW policy, technology-assisted food recovery and distribution via mobile applications were not as positively received and deemed non-feasible. There is a number of emerging free mobile applications, such as *Too Good To Go* and *Flashfood*, that aim to connect food retailers to consumers with real-time information on foods nearing their end of shelf life yet are still safe to consume. Again, employee competency and language are challenges in implementing this type of food recovery. Furthermore, the process of listing clearance products was perceived as labour intensive and not likely to garner interest from the owners and senior management.

## **Mandatory Food Donation**

Mandating grocery stores to sign food donation contracts with charitable organisations received positive support by the participant.

*“If they make it as a law, it should be good for the people, and for the owners, and whoever owns the small businesses like the grocery stores. It’s a good idea, I think, if they do donations.”*

However, it is not without its challenges or concerns to the store. First, legislation to mandate food donation would conflict with existing store policy and management’s perception of food donation as a financial loss. Second, the participant expressed uncertainty regarding setting up food donation and selecting the organisation(s) to work with. Last, internal quality of food cannot be guaranteed, especially for donations, and product complaints can be a challenge even for products sold.

### **6.1.4. Missed Opportunities**

Several missed opportunities were identified that could help the store reduce FW. The identified practices that unintentionally contribute to FW can be categorised as internally or externally driven. Internally driven practices are a result of the company’s formal and informal store policies or in some cases, a lack of them. Overstocking product was the first store practice observed. It is common for retailers to have fully stocked shelves, regardless of how quickly they sell, to visually appeal to consumers. In-store observations of the shelves and bulk bins confirmed this practice. The bulk bins observed were generally at least half full and also, were in the box style of plastic containers with hinged lids, which due to the style, can contribute to accelerated food spoilage and allow contaminants to enter when the hinged lids are opened. An alternative is to install tightly sealed gravity feed bins with false fronts to always appear full. In addition, a significant portion of produce is displayed outdoors at the storefront where sun and the natural elements can accelerate food spoilage, especially in the summer. This particular winter, however, was likely to cause food spoilage as well, had the staff not moved the outdoor produce displays indoor in response to the extreme weather event (i.e., arctic flow). There is a missed opportunity here to raise employee awareness and train them on ways to face product on the shelves so they appear to be

fully stocked without surplus, and to rethink the design of their indoor and outdoor product displays.

The second internally driven practice is the store does not donate excess unsold food, regardless of free collection services. Whatever is leftover of the discount bags by the end of the day is disposed of in the organics bin. A potential reason provided for this practice is that senior management may perceive food donations as a financial loss.

*“We recently got somebody here in the store, and [volunteers] were offering if you do the donations, [volunteers] were collecting locally. And I talked with my manager, but they said ‘no, we don’t do any donations.’ It might be that they’re making money by selling them in the bags. If they donate it, they won’t be, so that might be a loss for them.”*

Food donation is an encouraged recovery method from the FW solutions hierarchy and is a missed opportunity in this case. Again, there is an opportunity for FW awareness and training to help alleviate these business concerns, help management recognize the financial cost of FW, and help them identify specific FW mitigation practices that can help reduce further financial losses.

Third and related to the previous opportunity, FW and organic waste are not currently measured or tracked by the store. An electronic scanning system is in place for purchasing and inventory management but similar technology is not used or being explored to measure food going to waste. Without measuring FW, it is difficult to see how much food is wasted, estimate related financial losses, or evaluate the extent and efficacy of the store’s FW mitigation practices.

Fourth, the store does not have policies specifically addressing FW, neither in terms of measurement, FW reduction targets, nor food awareness training. Refresher training for existing employees could be included on an annual basis to keep all staff up to date with new requirements or process improvements. At the time of the interview, only new employees undergo training, foremost for retail operations and any FW reduction appears to be secondary or unintentional. There is also a missed opportunity of educating consumers in the store on FW. From the in-store observation, no marketing materials were visible to raise FW awareness or to promote non-uniformly shaped produce that still have the same nutritional content as uniformly shaped produce. Some large retailers market their own brand of imperfect produce by educating their

customers. For example, Loblaws' brand of "Perfectly Imperfect" produce. Furthermore, the clearance bags were observed displayed at ground level and could be more visible without taking priority over their more profitable foods, for example, near the checkout counter.

In terms of externally driven practices that contribute to FW at the store, the practices identified are related to issues with the local FSC. As a result of the produce market and local supply, the store purchases the majority of its produce from far away and tends to buy more than it might need for logistics to be cost-effective.

*"Most of the stuff comes from out of the country, especially from California... If we order from another country, then we order in more quantity."*

Moreover, temperature issues during transportation can cause food to spoil but are not always visible from the exterior and cannot be caught by the store at receiving since they do not cut product open to inspect internally. These external issues may require a policy solution aimed beyond the retail sector, however, there are still opportunities here to improve knowledge sharing between the shipper and the retailer as well as applying technology to measure and manage temperature during transport, which benefits both the shipper and retailer.

### **6.1.5. Barriers**

The barriers to implementing FW mitigation practices at the store were found to be related to owner and senior management perceptions and priorities, limited resources and physical retail space, language, and the local produce industry. The identified barriers are expected for small businesses; however, through this case study, nuances are revealed and are used to consider policy implications.

#### ***Owner and Senior Management Perceptions and Priorities***

Store policies, especially on food donation, demonstrate that FW mitigation is not a priority at the top level of management.

*"It all depends on the Owners and the General Managers... The owners have to put focus on it."*

This could be due to the speculation provided by the participant that food donations are perceived as a financial loss to top management or that implementing FW mitigation practices do not benefit the business.

*“If we donate food... I won’t see much benefit for myself or for the store. It would be beneficial for the people who need the food.”*

I also speculate that this could be due to perceiving food donations as a potential legal risk that top management would rather avoid. In contrast, top management could simply be satisfied with the current practices in place.

*“We sell the produce – whatever is on discount – very fast. Every day we make like a hundred of those bags and we sell them very fast.”*

However, without proper measurement and tracking, it is difficult to estimate how much and how consistently food is diverted from the organic waste bin as a result of the clearance bags; to raise awareness on the store’s impact on FW; and to show the potential benefits to the business from FW mitigation strategies. Potential policies should consider building awareness among small grocers and motivating them to prioritise the matter.

### ***Limited Resources and Space***

Limited resources were expressed throughout the interview, especially for purposes to measure and track FW. Small businesses, compared to large corporations, have fewer resources and in the context of this case study, translates to focusing available human and technological resources on daily operations and less on strategizing around FW. This is a key policy implication when small grocers lack the capability to devise waste reduction solutions and are unable to take the lead on the fight against FW. Thus, expertise or technical support for small businesses should be included in any proposed policy option.

This barrier also extends to limited capital and physical retail space. Physical space is a premium so it is likely that the store tries to maximize its retail display space by displaying foods externally on the sidewalk. This display space limitation might also explain why FW awareness materials were not posted, so that products and prices can be displayed instead. Furthermore, this could also be the reason why the clearance bags

were observed at ground level, reserving the more highly visible displays for more profitable products that can be sold. Lastly, limited capital would also be a barrier for installing new bulk bins with improved design. Policies targeting small grocers should consider multiple ways to raise FW awareness among their staff and consumers instead of physical signage.

### ***Language***

When it came to employee training, a language barrier was identified in this case. It is a clear policy implication for FW awareness and policy implementation. It could be that small grocery stores or stores specializing in ethnic foods are more prone to facing this barrier; however, Metro Vancouver contains a diverse population and consideration for simple education materials in multiple languages would be helpful overall.

### ***Local Supply***

The last barrier identified that the store faces is the lack of local options for produce. As explained by the participant, a significant amount of produce sold in BC is imported, adding to travel time, potential for temperature issues, and having to buy in larger quantities to make it worth shipping. This has especial impacts on small grocery stores since their buying power is not as strong as large retailers. As a result, there is less time for the store to sell the imported produce while having excess product at the same time. When asked what actions the participant would like to see from local or provincial governments to help small grocers address FW, the one suggestion was to improve the local FSC in BC.

*“If we have the local food or produce, we could order as much as we want, it could arrive faster, we don’t need to order it in more quantity, and it won’t go bad.”*

The policy implication identified here points to the need for a larger, integrated, systems approach to the issue of food loss and waste in the FSC.

## **6.2. Case Study 2: Chain of Family-Owned and Operated Small Grocery Stores**

The second case study is a small grocery store chain with roughly 100 employees, located in commercial districts across urban areas of Metro Vancouver. The

company is family-owned and operated, and sells a range of foods including, but not limited to, fresh and prepared produce, dry and canned foods, fresh and prepared meats, poultry, and seafood, frozen foods, dairy products, and baked goods. Products are sold primarily in-store with a limited selection sold online through mobile applications (e.g., Cornershop by Uber). The findings below are the results of an interview with the Director of Operations and self-guided in-store observations of one of the stores in the chain.

### **6.2.1. Food Waste Mitigation Practices: Reduction, Recovery, and Recycling**

Employee training is the key reduction method utilised by the company and it includes topics such as inventory rotation, product storage, and proper stocking of shelves. In-store observation supports these practices and an employee was observed stocking produce in limited quantities on the outdoor displays, which were propped in a way for the bin to appear full, and was replenishing the displays frequently. In the case of sensitive produce like avocados, they were observed displayed only in a single layer. The reasons to cover these topics are clear to management and they aim to reduce product spoilage and extend product shelf life with their training.

Most of the mitigation practices in place at the stores function to recover food. These include discounting, processing, and donation. For discounting, produce nearing their end of shelf life are packaged in bags and reduced to \$1. In-store observation found that these clearance bags were displayed outside at the store entrance and were hard to miss, which likely contributes to their quick sale.

*“We would bag them in \$1 bags, and they would move out the day of, basically.”*

The company also uses technology to assist in selling these clearance bags.

*“We also use... Too Good To Go app. That’s something we started recently.”*

Too Good To Go is a third party company that uses an application on mobile devices to conveniently connect customers to businesses with excess food to sell. Customers can view businesses listing food for sale, pay for their purchases directly through the application, and set alerts for when their favourite businesses have new listings. The

store's clearance bags are sold on the application as 'mystery bags'. As a mystery bag, there is no need for the store to list the ingredients within the clearance bags and can be easily sold as-is. Customers knowingly purchase this product without knowing the contents until the product is picked up, hence the name 'mystery bag'. This makes it easier for the store employees and reduces administrative burden.

The store also has some in-house processing capability to recover food. Produce near its end of shelf life that have salvageable portions are trimmed and packaged into ready-to-eat containers. In-store observation found that this practice extended beyond ready-to-eat items and included ready-to-go vegetable packs for convenient cooking as well. In conjunction with discounting, these packages do not have an issue selling.

*"They sell quite quickly because people, when they're grabbing their lunch, want something quick, like some cut-up watermelon or cantaloupe or honeydew. And they sell for like \$1.99, \$2.99, or \$3.99 and customers are usually pretty responsive to those."*

As for food donation, the company occasionally donates to feed both humans and animals. This is done through convenient pick-ups by a local food recovery organisation and local rabbit farmer, respectively. Donations to the local rabbit farmer consist of carrot top trimmings and are prioritised for feeding animals over organic waste recycling.

Organic waste recycling is the last mitigation practice employed by the company and the stores do this by separating and sorting organics from cardboard, plastics, and general garbage for collection by a contracted waste management company. Overall, the company employs a variety of FW mitigation practices from all levels of the FW solutions hierarchy, although no particular order of priority was provided, with the exception of the last practice of organic waste recycling.

### **6.2.2. Drivers and Perceptions of Reducing Food Waste: Cost Savings, Environmental and Societal Benefits**

Because the company's owners recognize the financial aspect of FW, cost savings is a significant driver for the FW mitigation practices in place at the stores.

*“Owners [are] trying to save costs, recover as much product because that’s money down the drain when you throw out product.”*

In addition, management has a considerable awareness of FW, particularly the general environmental benefit of reducing waste and the societal benefits of food recovery.

*“It’s a great way to support your community as well. I mean it reduces your food waste and it’s a feel-good thing.”*

This positive perception that senior management has on FW reduction, in combination with recognizing the business case, is likely to be a strong factor in the number of FW mitigation practices implemented at the stores. For small grocers where owners and senior management recognize the business case of FW reduction and value the environmental and societal benefits that it brings, policies should aim to support these businesses in their reduction and recovery efforts through tools that further enable these practices or by lowering identified barriers.

### **6.2.3. Reception to Potential Food Waste Policies**

In consideration of the company’s current level of FW awareness, six potential FW policies were shared with the participant to better understand potential stakeholder impacts. The findings below reveal the support or feasibility for each and briefly touch upon the barriers to FW reduction faced by the store.

#### ***Measuring and Tracking Food Waste***

Measuring and tracking FW was not opposed by management; however, concerns related to labour were highlighted. The company does not currently measure the quantity of its FW nor track its destination(s) and reason(s), and foresee this degree of record-keeping to be labour-intensive. As explained by management, the store employees may take on multiple roles throughout their shift as a result of a limited number of staff. Due to this, FW measurement and tracking would impact the stores’ current operations and overburden their employees.

## **Waste Audits and Inspections**

Rather than overburdening store employees with measuring waste, the option of locally enforced store waste audits and inspections was explored. Management was cautious but understood the value that an audit could provide and would support it the best that they could.

*“For a smaller business it would take some time getting used to. It would be a little uncomfortable at first. It’s kind of like getting a health inspector come by. Making sure everything is in line, standards are up. But that would help businesses run better in a way too, help them out. If the stores are having too much food waste, they can provide tips and resources to help them lose less [food], lose less money, help businesses grow. It is new forward thinking. People should / would have the mindset getting into that. At least for our business, if that were to happen, we would be all in. We would try our best to make it happen for sure.”*

As an alternative, voluntary store waste audits and inspections through contracted third parties were also explored. Again, management understands the value that they can provide and would support it; however, the potential costs of the service may be a significant barrier for the company.

*“If it didn’t cost the business any money, and they would be able to do that, then we would be open to that.”*

## **Food Waste Reduction Targets**

Setting and working toward FW reduction targets require measuring and tracking FW. Therefore, while not opposed by management, this policy would be difficult for the company due to limited labour resources, as discussed in the earlier section on Measuring and Tracking Food Waste. The company currently does not have formal written policies or training manuals to reduce FW so it would not be prepared to implement such a policy without additional resources.

## **Mandatory Food Donation**

Mandatory food donation received positive support by management. This is largely due to the fact that the company already participates in food donation and has been able to partner with organisations that make it easy for the stores.

*“They make it easy for us. We just put it in a box and tag it... and they would come to pick it up... We wouldn't mark down how many pieces of this we put in, of this.”*

Furthermore, donation liability is not a concern for management due to the trust in their employees and the training provided. Management shared that there have not been any liability issues, which is likely due to the province's *Food Donor Encouragement Act* in force since 1997. Overall, it is essential for donations to not require paperwork or logistics in order to encourage this practice at small grocery stores where there is limited staff that operate the stores.

### ***Food Recovery and Distribution via Mobile Applications***

Technology-assisted food recovery and distribution via mobile applications was already in use by the company so it was supported by management and positively received. Management shared that the Too Good To Go application is user friendly, easy to schedule pick-ups with customers, easy to list 'mystery bags', and also promotes FW awareness by offering promotion codes to the company to encourage store employees to use the app as customers as well.

*“That's a great anti-food waste app for businesses... The app is very thought-through and it's very easy to use.”*

In contrast to the other policy options, this option did not prompt a labour resource concern for management. This is speculated to be due to the technological assistance provided by the app and can be a consideration in designing policy options aiming to improve FW measurement and tracking.

The one issue that was brought up by the participant regarding Too Good To Go was the concern of supply and having enough quantity listed on the app. The stores are encouraged to offer as much product as possible or spread them throughout the week in order to obtain a steady level of marketing coverage for the business; however, the quantity of clearance bags fluctuates from week to week. As this is a market-based tool, the clearance bags are treated as a product to be sold and if stores are asked to increase the supply of them, this can cause the opposite of the intended effect and result in generating surplus food. At this time, Too Good To Go does not require a minimum quantity in order for stores to participate in the program.

## ***Raising Food Waste Awareness Among Customers***

It was uncertain to management what the impact and feasibility of promoting food recovery and raising FW awareness among the store's customers would be. Although the company recently decided to participate in Too Good To Go, its promotion in the stores raises concerns with the owners on its effects to the company's brand reputation.

*“Would that attract more clearance people looking for reduced [prices] and bring down our brand that way?... Are we a business that causes a lot of waste?”*

Since raising consumer FW awareness can be done in many forms, the company has the freedom to develop awareness materials in a manner that works for their stores and appeals to customers at the same time. This should be a consideration when designing grocery store awareness campaigns or any policy related to communicating FW mitigation practices to customers.

### **6.2.4. Missed Opportunities**

The company employs a variety of FW mitigation practices and its overall actions indicate a level of FW awareness and support by management for FW reduction. As a result, there are only a few missed opportunities and any further mitigation practices would require significant effort and additional resources.

First, formalization of the company's policies and employee training on FW reduction is a missed opportunity. Formalization ensures commitment to the good practices already in place, and the ability for continuation beyond the current trainers and managers. Taking time now to document their knowledge and successful practices may save time and ensure consistency in training others in the future.

Second, now that the company uses Too Good To Go, the stores can leverage the technology to measure and track the quantity of their clearance bags and quantify the amount of food that the stores have diverted from organic recycling. In combination with tracking their organic waste haulage fees, FW can be roughly estimated to start.

Third and last, there is a missed opportunity of raising FW awareness among customers at the stores. As discussed in the previous section, developing materials on

FW to post in the stores can be done in a way to also promote the company's brand and its support for the environment and society.

### **6.2.5. Barrier: Limited Resources**

The company already has a level of FW awareness, and FW reduction, recovery, and recycling; however, limited resources in labour, finances, and expertise, bar the company from doing more, like the larger food retailers, to tackle FW. As a small business, the company operates with tight margins, which does not allow for a large workforce and requires employees including management to take on multiple roles. This makes it difficult for the company to designate staff for continuous improvement initiatives to fight FW, in addition to their multiple operational roles already.

*“Everybody’s wearing many hats. Like, even myself, I may have to hop on cash just to support stores because two to three cashiers are sick. And because we just don’t have the same resources as the big box stores where one store will have 100 staff instead of split between four places.”*

Even though management is aware of the value of reducing FW, limited finances hinder the company from doing so. Low margins and finances make it difficult for the company to increase its workforce, designate an internal policy writer, hire subject matter experts, increase its processing capability, and invest in technology to improve processes.

*“It’s really tough. Let’s say there was a service available and we had to pay for it. It is good for the business but its really tough for smaller businesses. It’s like a marketing company coming in presenting all these opportunities to promote your business to do better. It’s really tough when you’re running with so much lower margins and funds. It’s different aspect from a big box store.”*

Based on the findings of this case study, policy considerations should include financial support and access to FW reduction resources, such as consumer FW awareness materials or sample FW measurement and tracking templates.

## Chapter 7. Policy Options

In this chapter, I present three policy options for addressing FW generated in the Metro Vancouver retail sector with a focus on the top tiers of the FW solutions hierarchy. These options are intended for a municipal level of government and are based on the policy instruments identified in my jurisdictional scan, while at the same time, guided by the findings in my case studies. The first of the policy options centres around mandatory food donation and employee training on food donation guidelines by food retailers. The second involves reducing property taxes for food retailers who donate food. The third involves the Pacific Coast Food Waste Commitment.

### 7.1. Mandatory Food Donation and Employee Training

Food donation is situated high on the hierarchy of FW solutions and is the preferred food recovery method as it retains the food's original purpose, to feed humans. This policy option, which is based on the French Garot Law, addresses FW generated in the retail sector by making it mandatory for food retailers to participate in food donation and train their employees on the practice. This entails the use of a municipal by-law or other regulatory instrument to mandate food retailers to have a food donation program that includes 1) a valid food donation contract with a registered non-profit charitable organisation, and 2) employee training on food donation guidelines, such as the [BC Centre for Disease Control \(2019\) Industry Food Donation Guidelines](#). The terms of the contract, such as frequency, transfer of ownership, logistics, etc., are to be negotiated between the food retailer and the non-profit charitable organisation.

This policy can be streamlined as part of the municipal business licence application process and every business' food donation program should be submitted for review as part of it. Unlike the Garot Law, there would be no sanctions or food destruction bans associated with this policy; however, food donation contracts would be necessary in order for businesses to receive and renew their business licence. This policy would apply to all food retailers classified as grocery stores and supermarkets, which are primarily engaged in retailing a general line of food, and would exclude convenience or general stores that sell a limited line of food and convenience items, such as those in remote areas.

## **7.2. Food Donation Tax Reduction**

An alternative to mandatory food donation is incentivizing food retailers to voluntarily participate in the practice through the use of a fiscal instrument. A food donation tax credit currently exists in BC for certain provincially grown agricultural products but is only applicable to farmers or farming corporations and ends in 2024. In response to this gap, I propose a policy option based on the concept of the Italian Gadda Law's waste tax reduction. This policy option would reduce municipal property taxes for food retailers that donate food. The discount rate would be the same across Metro Vancouver and would need to be carefully calculated to meet an optimal quantity of annual food donations sought for recovery from food retailers in the region without resulting in the municipalities wholly paying for the practice. This discount rate would then be applied to the weight of food donated, so that the food retailer's property tax is reduced proportionally to the amount of food donated.

## **7.3. Pacific Coast Food Waste Commitment Campaign and Grants**

In 2008, the province of BC signed a Memorandum of Understanding with four other coastal jurisdictions in the US to establish the Pacific Coast Collaborative, which aims to work together to develop climate and clean energy agreements. An agreement known as the Pacific North American Climate Leadership Agreement, signed in 2016, included a Food Waste Reduction Project, which worked toward advancing food recovery initiatives to reduce carbon emissions from FW in the region. In 2020, the West Coast Voluntary Agreement to Reduce Wasted Food was launched and has recently been rebranded as the PCFWC. ([Pacific Coast Collaborative, n.d.](#))

Having already received funding and support from the province of BC and the City of Vancouver, the PCFWC is an existing voluntary agreement open to food retailers in Metro Vancouver; however, at present, no Canadian grocery stores are signatories to the commitment. This policy option would see the member municipalities of the Metro Vancouver region partner with and promote the PCFWC through communications to food retailers, and provide financial grants to eligible small and medium-sized grocers who join and stay on for a second year. Currently, the PCFWC is free for signatories in their first year of joining but are charged an annual fee thereafter. Becoming a signatory

provides access to industry best practices, resources, support, and working groups, which can help small grocers improve their operations and practices to measure FW and reduce surplus food, which is the most preferred FW solution according to the hierarchy. Note, due to time constraints of the interviews, case study participants were not asked about the PCFWC and did not mention it during the interviews.

## **Chapter 8. Policy Analysis**

In the first section of this chapter, I present my selection of objective, impacts, and criteria that make up the framework for my policy analysis: environmental sustainability, stakeholder compliance, stakeholder acceptance, cost, and administrative complexity. I specify their related measures and define the scoring used to gauge each policy option. In the subsequent sections, I discuss projected outcomes of each policy option and explain their scores based on my framework.

### **8.1. Criteria and Measures**

#### **8.1.1. Environmental Sustainability**

Environmental sustainability is the key objective sought from the proposed policy options presented in Chapter 7. The impact of FW on the environment is far-reaching through its GHG emissions, which impact agriculture globally and the FSCs in Canada. Although this in turn can significantly impact food security and living conditions for vulnerable Canadians, food security is excluded as a key objective and is taken into account through the FW solutions hierarchy, where feeding people is high on the priority order, to avoid double counting.

The criterion selected for environmental sustainability is the mitigation of FW generated in the retail sector by small and medium-sized grocers, in a manner according to the FW solutions hierarchy. It also comprises capability-building within this sector to mitigate FW, for example the capability to quantify FW. To measure the first criterion, my analysis considers the degree to which the policy option would increase the ratio of surplus food reduced and recovered, versus recycled and disposed. To measure the second aspect of this criterion, my analysis considers the change in the quantity and / or quality of tools / resources (e.g., training materials, consultations, industry fora, etc.) for small and medium-sized food retailers to mitigate FW.

## 8.1.2. Key Impacts

### ***Stakeholder Compliance***

Stakeholder compliance is a consideration I give to small and medium-sized grocers who are expected to be directly impacted by the proposed policy options. I measure this by the new monetary and / or administrative burdens that the policy options impose that would cause non-compliance in this sector. Compliance by small and medium sized grocers is a critical measure since limited financial and human resources are a key barrier to practicing food mitigation, as revealed in the case studies, and is critical for any of the policies to successfully influence behaviour.

### ***Stakeholder Acceptance***

There are other groups identified that hold a stake in the proposed policy options to reduce FW: the general public (including users of food aid organisations), large food retailers, food aid organisations, and organic waste haulers (Table 3). Acceptance by these stakeholders can be measured by the degree of opposition among them.

*Table 3. Roles of stakeholders.*

<b>Stakeholder</b>	<b>Roles</b>
<b><i>General public</i></b>	Customer of food retailers; individual donor to and/or user of food aid organisations; end consumer
<b><i>Large food retailers</i></b>	Customer of food suppliers and organic waste haulers; supplier to consumers; donor to food aid organisations
<b><i>Food aid organisations</i></b>	Recipient of food donations; customer of organic waste haulers; supplier to food donor users
<b><i>Organic waste haulers</i></b>	Service provider to the general public, food retailers, and food aid organisations

### ***Cost***

Another key impact for consideration in my policy analysis is the monetary cost to government to implement and maintain the policy option. This can be measured by the dollar amount required by municipal governments to fund and execute the policy option. This is an important measure for municipal governments when municipal budgets must be strictly adhered to and failure to accurately account for costs can result in a termination of city programs and services.

## **Administrative Complexity**

The final key impact for consideration is administrative complexity, which refers to the complexity of mechanisms, such as additional workflows and paperwork, required for the government to execute the policy option. This can be measured by the change in net quantity of mechanisms needed by the municipal government to implement and maintain the policy option. Administrative burden for grocers to comply with the policy option is already included for consideration under the stakeholder acceptance criterion.

### **8.1.3. Criteria and Measures Scoring Chart**

Each measure related to a key impact criterion is scored out of two points while each measure for an environmental sustainability criterion is scored out of 4 points (i.e., worth double). The maximum score a policy option can receive is 16 points as shown in Table 4 below.

*Table 4. Evaluation criteria, measures, and scoring for policy analysis.*

<b>Objective</b>	<b>Criteria</b>	<b>Measure</b>	<b>Scoring</b>
<b>Environmental sustainability</b> (x2)	Mitigates FW by small and medium sized grocers, in a manner according to the FW solutions hierarchy	Ratio of surplus food reduced and recovered, versus recycled and disposed by small and medium sized grocers	Good (4) – Significantly increases ratio of surplus food reduced and recovered, versus recycled and disposed  Fair (2) – Moderately increases ratio of surplus food reduced and recovered, versus recycled and disposed  Poor (0) – Slightly increases ratio of surplus food reduced and recovered, versus recycled and disposed
	Develops capability within small and medium-sized grocers to mitigate FW	Quantity and / or quality of tools / resources to build capability	Good (4) – Significantly increases quantity and / or quality of tools / resources to build capability  Fair (2) – Slightly increases quantity and / or quality of tools / resources to build capability  Poor (0) – No change in quantity and / or quality of

			tools / resources to build capability
<b>Impact</b>	<b>Criteria</b>	<b>Measure</b>	<b>Scoring</b>
<b><i>Stakeholder compliance</i></b>	Limit negative impact to small and medium sized grocers that would cause non-compliance	Monetary and / or administrative burdens on small and medium sized grocers	<p>Good (2) – No new monetary or administrative burdens to cause non-compliance</p> <p>Fair (1) – Either a new monetary or new administrative burden to cause non-compliance</p> <p>Poor (0) – New monetary and new administrative burdens to cause non-compliance</p>
<b><i>Stakeholder acceptance</i></b>	Acceptance by the public, large food retailers, food aid organisations, and organic waste haulers	Percentage of opposition by the identified stakeholders	<p>Good (2) – No majority opposition by any stakeholder</p> <p>Fair (1) – Majority opposition by half of the stakeholders</p> <p>Poor (0) – Majority opposition by all of the stakeholders</p>
<b><i>Cost</i></b>	Limit monetary cost to government	Dollar amount required to fund the policy option	<p>Good (2) – Low cost</p> <p>Fair (1) – Moderate cost</p> <p>Poor (0) – High cost</p>
<b><i>Administrative complexity</i></b>	Limit administrative complexity to government	Change in net quantity of mechanisms (e.g., workflows)	<p>Good (2) – No net change in mechanisms</p> <p>Fair (1) – One additional mechanism needed</p> <p>Poor (0) – More than one additional mechanism</p>

## 8.2. Policy Analysis: Mandatory Food Donation and Employee Training

Based on my analytical framework, mandatory food donation and employee training on food donation guidelines score the best out of the three policy options. The scores for each criterion as applied in this policy scenario are presented in Table 5. The advantage of this policy lies in its flexible policy terms and limited impact to government yet still guaranteeing food recovery. The main drawback of this policy option is that it

creates a firm imposition on grocers and regulation is typically poorly received by industry.

Table 5. Score chart for the mandatory food donation and employee training policy.

Criteria	Projected Outcomes / Impacts	Score
<b>Environmental sustainability:</b> Mitigates FW by small and medium sized grocers, in a manner according to the FW solutions hierarchy	⊕ Significantly increases amount of surplus food recovered among all grocery stores	Good (4)
<b>Environmental sustainability:</b> Develops capability within small and medium-sized grocers to mitigate FW	⊕ Establishes connections with the food aid organisation network ⊕ Mandatory employee training on FW and donation guidelines	Fair to good (3)
<b>Stakeholder compliance:</b> Limit negative impact to small and medium sized grocers that would cause non-compliance	⊖ Increases administrative burden from developing food donation contracts, tracking donations, and maintaining employee training records	Fair (1)
<b>Stakeholder acceptance:</b> Acceptance by the public, large food retailers, food aid organisations, and organic waste haulers	⊕ Minimal opposition by the public, and food aid organisations ⊖ Opposition by some food retailers and organic waste haulers	Fair to good (1.5)
<b>Cost:</b> Limit monetary cost to government	⊕ No new funding required	Good (2)
<b>Administrative complexity:</b> Limit administrative complexity to government	⊕ Uses existing workflows that issue business licenses to monitor food donation contracts	Good (2)
<b>Total Score</b>		13.5 / 16

### 8.2.1. Environmental Sustainability

This policy option legally compels grocery stores of all sizes to donate food and in doing so, addresses any lack of drivers for grocery store owners and / or management to donate food. This policy, however, does not regulate frequency or quantity and allows for negotiation between food retailers and food aid organisations. Despite no prescriptions for these parameters nor non-compliance measures, it is not anticipated that grocers will sign contracts with non-profit charitable organisations with the intention

of not donating food since contracts demand mutual benefits for the parties involved and signing in good faith. This also allows for negotiation of terms and conditions based on parties' capacity and means, such as the maximum acceptable quantity per donation, the required minimum number of days remaining before the food expires, or the maximum number of days past the BBD. These terms and conditions also work to help prevent food retailers from dumping FW onto the food aid organisations and promotes better management of unsold food.

Mandatory food donation is projected to significantly increase the quantity of surplus food recovered through food donations, by an amount equivalent to the decrease in FW recycled in the status quo. This would result in a higher ratio of surplus food reduced and recovered, versus recycled and disposed, and thus scores well in the first criterion of mitigating FW. Results of the Garot Law after three years of implementation also indicate that mandatory food donation has had a positive effect on the source of food supply of three main food aid associations in France. Companies' donations (including food retailers) became the top source of food after the introduction of the law ([Ernst & Young, 2019](#)). It is important to note that although the quantity of companies' donations have steadily increased since the law, the rate of increase has slowed considerably after the first year of implementation (40% in 2016 and 9% in 2017) ([Ernst & Young, 2019](#)). This indicates a limit to FW mitigation through food recovery in the retail sector.

The second criterion of developing capability within small and medium-sized grocers to mitigate FW also scores fair to good. Through mandatory food donation, connections with food aid organisations are established; and through mandatory employee training on food donation, grocery store employees build their awareness of FW and knowledge of donation guidelines. This includes the distinction between BBD and expiry dates, confusion of which has shown to be a cause of FW at retail. Observations on the impact of the Garot Law also included findings that food retailers developed professionalization of the management of unsold foods, as intended by the mandatory quality management plan for donations within the policy. At the same time, aid organisations gained advantages in logistics support on the coverage of stores in isolated areas and improved product sorting, attributable to the food donation training received by grocery employees ([Ernst & Young, 2019](#)).

## **8.2.2. Stakeholder Compliance and Acceptance**

Stakeholder compliance by small and medium-sized grocers scores fair in this policy option. No to minimal monetary costs are expected but more importantly for those who do not currently participate in food donation, they can expect an increase in administration required to develop food donation contracts, track food donations, and maintain employee training records. As a result, it is anticipated that some food retailers may not comply with mandatory food donation and training; however, this may be minimal since both case studies showed support for this policy option, even when one of the stores was not donating food.

As for the other stakeholders, acceptance scores fair to good. Opposition is expected from some organic waste haulers due to the projected impact of decreased demand for their services. On the other hand, large grocers are likely already donating food so it is anticipated that this policy would receive majority support by them. As well, food aid organisations and the public are likely to respond positively to the social welfare aspect of food donation, especially considering the Second Harvest report noting the high demand for food aid. Furthermore, there are more than 6 times the number of food charities than grocery stores in BC, more than the average in Canada (Nikkel et al., 2021). This makes it unlikely that mandatory food donation would overwhelm the current food charity network and can instead address the supply short fall observed in the system.

## **8.2.3. Cost and Administrative Complexity for Government**

This policy option scores well on its minimal impact to the municipal government since no new funding and mechanisms are required to implement and maintain this policy. Administration and enforcement of the policy can be streamlined with existing workflows that are used to issue and manage business licenses in the city. Although sanctions are not designed into this policy, compliance is not projected to be a major issue and can be managed similarly to enforcement of business license non-compliance.

### 8.3. Policy Analysis: Food Donation Tax Reduction

The policy option of reducing taxes proportionally to food donation scores the lowest out of the three policy options; however, it still has its merits. The scores for each criterion as applied in this policy scenario are presented in Table 6. The strength of this policy lies in the positive compliance by grocers, based on their drive to reduce store costs and the financial incentive this policy provides to food retailers who donate food. The main drawbacks of this policy option are that it does not fundamentally promote tools / resources for small and medium-sized grocers to mitigate FW and it places additional administrative burden on the municipal government while also decreasing tax revenue.

Table 6. Score chart for the food donation tax reduction policy.

Criteria	Projected Outcomes / Impacts	Score
<b>Environmental sustainability:</b> Mitigates FW by small and medium sized grocers, in a manner according to the FW solutions hierarchy	⊕ Significantly increases amount of surplus food recovered at financially motivated grocery stores	Good (4)
<b>Environmental sustainability:</b> Develops capability within small and medium-sized grocers to mitigate FW	⊕ Small and medium-sized grocers are incentivized to learn how best to measure and track recovered food for tax purposes	Fair (2)
<b>Stakeholder compliance:</b> Limit negative impact to small and medium sized grocers that would cause non-compliance	⊕ Reduces property taxes, dependent on quantity of food donations and policy cap ⊖ Increases administrative burden from tracking food donations and filing taxes	Good (2)
<b>Stakeholder acceptance:</b> Acceptance by the public, large food retailers, food aid organisations, and organic waste haulers	⊕ Minimal opposition by the public, food retailers, and food aid organisations ⊖ Opposition by organic waste haulers	Fair to Good (1.5)
<b>Cost:</b> Limit monetary cost to government	⊕ No new funding required ⊖ Decrease in municipal tax revenue	Fair (1)
<b>Administrative complexity:</b> Limit administrative complexity to government	⊖ New mechanisms needed to verify food donation tax receipts and apply tax reduction	Poor (0)

### **8.3.1. Environmental Sustainability**

More grocers are projected to voluntarily participate in food donation rather than recycle or dispose food waste, in response to a financial incentive to donate food. The activities of recycling and disposing are costs for the store and paid to organic waste haulers. As revealed in the case studies, cost savings can be a major driver for business decisions for some small grocers and this policy option leverages that to influence their behaviour. In addition to the increase in food recovery participation, this policy option is anticipated to result in greater food recovery than mandatory food donation since there is an incentive for every pound of food donated. For grocers who are not currently donating food, there will be a shift from recycling or disposing surplus food to recovering it, which conforms to the FW solutions hierarchy. Whereas, for grocers who are already food donors, this policy option simply provides an incentive for the practice to continue. It is not anticipated that this policy would increase the generation of surplus food only to be donated, as long as the tax reduction rate is appropriately set to offset some losses and is not wholly paying grocers for donating. In a study that examined how to lever waste taxes to increase food donations by Italian supermarkets in response to the Gadda Law, [Franco & Cicatiello \(2021\)](#) found that under certain conditions, a waste tax reduction can result in an economic win-win situation for both the municipality and the supermarkets. These conditions, which can be set by the municipality, include 1) carefully defining the tax discount and store eligibility, taking into consideration the municipality's characteristics, such as its food retail and donation landscape; 2) setting a minimum and maximum quantity of food donated at the store level to ensure sustainability and maximum efficiency of the policy; and 3) comparing the expected annual value of the tax break with the total waste tax revenue to ensure balance between the gains to the municipality and gains to the retailers. Based on this study and the projected increase in food recovery, the food donation tax reduction policy scores well in mitigating FW.

As for building capability within small and medium-sized grocers to mitigate FW, this policy option scores as fair. It is anticipated that financially motivated grocers will seek out food aid organisations, build relationships with them, and measure and track their food donations for tax purposes. However, that is the extent to which this policy is projected to build capability for environmental sustainability since there are no incentives

for grocers to measure and track destinations of surplus food aside from donation; to train employees; or to build FW awareness. As a potential consequence, there is the risk that this policy results in food retailers transferring their FW onto food aid organisations, either intentionally or unintentionally, due to the desire to take advantage of the tax break or due to a lack of knowledge on food donation guidelines and product sorting.

### **8.3.2. Stakeholder Compliance and Acceptance**

Stakeholder compliance of this policy option receives a good score due to the policy's voluntary nature and financially based incentive. Small and medium-sized grocers who are currently food donors are projected to effectively follow the policy because they stand to benefit from their existing efforts. Small and medium-sized grocers who are not, can voluntarily choose to gain financially from the policy but will see an increase in administration for measuring and tracking food donations as well as filing tax claims. However, since participation is voluntary, compliance with this policy option is a non-issue.

Stakeholder acceptance by the other identified groups score fair to good. Large food retailers are not likely to oppose this policy due to their current state of food donations and for reasons like above, the policy's voluntary nature and financial gains. Food aid organisations are also projected to not oppose a food donation tax break for food retailers since they stand to gain by receiving more food supplied into their organisations. In addition, Food Banks Canada has been a proponent of a national agricultural tax credit for fresh food donations, similar to the BC Farmers' Food Donation Tax Credit, for growers and processors where a significant amount of food loss occurs ([Food Banks Canada, 2016](#)). With greater attention on FW in the retail sector, it is expected that food aid organisations would welcome a fiscal policy that extends to food retailers as a mutual means to alleviate food security.

Opposition is not expected by the public who may be indirectly impacted by a reduced municipal tax revenue since a tax reduction for a social welfare activity typically does not receive the same degree of disapproval as tax reductions for other business activities. In contrast, organic waste haulers are the one category of stakeholders that would likely oppose this policy due to its negative impact on the demand for food recycling. However, through this policy, it is not guaranteed that all large grocers will

participate in food donation and there will still be a need for organic waste hauling services at food retailers for inedible and expired foods.

### **8.3.3. Cost and Administrative Complexity for Government**

In terms of impacts to the municipalities, the cost criterion scored fairly whereas administrative complexity scored poorly. This is because new processes will be required to manage and verify the food donation tax claims, and apply the reduction to property taxes. Moreover, this is expected to take place with a reduced tax revenue; but, as shown by Franco & Cicatiello (2021), it is possible to set conditions within this policy to favour an economic win-win situation for both the municipality and the grocers. At face value, municipalities may lose property tax revenue but in return, they will save on money spent on the disposal of FW and on assistance to food aid organisations.

## **8.4. Policy Analysis: Pacific Coast Food Waste Commitment Campaign and Grant**

Campaigning and providing grants for the PCFWC rank in between the two other policy options. The advantage of this policy lies in its overall stakeholder compliance, stakeholder acceptability, and capability-building to mitigate FW within and among grocer signatories. However, this policy option lacks guaranteed participation for FW mitigation compared to mandatory food donation, thus making cost and uncertain return on investment the major drawbacks. The scores for each criterion as applied in this policy scenario are presented in Table 7.

Table 7. Score chart for the PCFWC campaign and grant policy.

Criteria	Projected Outcomes / Impacts	Score
<b>Environmental sustainability:</b> Mitigates FW by small and medium sized grocers, in a manner according to the FW solutions hierarchy	⊕ Moderately increases ratio of surplus food reduced and recovered versus recycled and disposed among grocery stores	Fair (2)
<b>Environmental sustainability:</b> Develops capability within small and medium-sized grocers to mitigate FW	⊕ Builds relationships among food retailers, manufacturers, aid organisations, government, and FW experts  ⊕ Access to educational resources, sample forms and other documents  ⊕ Professional support, working groups, and consultations	Good (4)
<b>Stakeholder compliance:</b> Limit negative impact to small and medium sized grocers that would cause non-compliance	⊕ No monetary cost to participate for the first two years  ⊕ Participation is voluntary	Good (2)
<b>Stakeholder acceptance:</b> Acceptance by the public, large food retailers, food aid organisations, and organic waste haulers	⊕ Minimal opposition by all stakeholders	Good (2)
<b>Cost:</b> Limit monetary cost to government	⊖ Approximately \$62,000 required to fund grants and campaign	Fair (1)
<b>Administrative complexity:</b> Limit administrative complexity to government	⊖ New mechanisms needed to verify signatories and issue financial grants	Fair (1)
<b>Total Score</b>		12 / 16

#### 8.4.1. Environmental Sustainability

This policy option receives a fair score for the first criterion in environmental sustainability. Campaigning for the PCFWC and providing financial assistance through grants do not guarantee FW reduction or recovery by the majority of small and medium-sized grocers. However, for the eligible grocers who do sign on, there is an obligation to meet specified reduction goals, including the main goal to reduce and prevent wasted food by 50% by 2030 (Pacific Coast Collaborative, n.d.). This analysis is based on

tripling the current number of PCFWC signatories to obtain a maximum of 20 food retailer signatories in the Metro Vancouver area, a reasonable but ambitious number that takes into consideration the fact that the Courtauld Commitment obtained roughly 40 signatories in its first year, of which also included food manufacturers and brand owners across the UK. Since these signatories represent companies and not just stores, there is potential for the 20 signatories to make a strong impact across Metro Vancouver and beyond. Also, through the commitment, there is a greater emphasis on prevention and reduction of FW, which is the highest order of priority according to the FW solutions hierarchy. In the evaluation of Courtauld Commitment 3, significant quantities of waste were found to have moved up the waste hierarchy from disposal, increasing the recovery and recycling rate from 95% in 2012 to 99% in 2015 (WRAP, 2017). Furthermore, manufacturers and retailers were found to have cumulatively prevented an estimated 219,000 tonnes of food and packaging supply chain waste, which equates to approximately 555,000 tonnes CO<sub>2</sub>e saved throughout the lifetime of the third commitment (WRAP, 2017). Still, this policy option does not assure participation by all food retailers and does not immediately increase the ratio of surplus food that is reduced and recovered, versus recycled and disposed, as much as the other policy options do.

In terms of developing capability within small and medium-sized grocers to mitigate FW, this policy option scores well. The campaign aspect is projected to build awareness of the commitment among BC grocers and help facilitate more signatories, while the grants remove the financial barrier for grocer signatories to stay on beyond the first year. This allows them to continue building their capability to measure and track their FW. As identified in the literature review, FW measurement in the food retail sector is absent across Canada, and as identified in the case studies, limited resources bar small grocers from measuring and tracking their FW. Also, this policy places emphasis on FW reduction more so than the other policy options which focus on food recovery. Through this option, grocers are provided access to the resources (e.g., sample forms, training materials, etc.) and support that they need in order to improve their operations and practices to mitigate FW and reduce surplus food. The PCFWC also provides codified reporting to help businesses gauge their progress against others without naming companies and identify broader priority areas of action in the sector.

Grocers' capability to influence consumer FW is also projected to increase more in this policy option compared to the others because the resources offered in the

PCFWC extend beyond food measurement and include practices to leverage the role that grocers play to influence consumer behaviour towards waste generation. By building relationships among food retailers, manufacturers, aid organisations, government, and FW experts, it is expected to be easier for small and medium-sized grocers to implement FW reduction practices when they receive support from others and see how larger food retailers are implementing them. For example, Tesco's "Buy One Get One Free Later" concept can be applied to small grocers and can be relatively easy to implement; this allows the business to keep its promotions and give consumers the same economical value but provides more flexibility for the consumer to use up the food before it spoils (WRAP, 2010). Other campaigns by large food retailers that bring attention to FW, such as Loblaws' 'Naturally Imperfect' line of produce, can also help inform smaller grocers on how these campaigns have impacted their business, a concern highlighted in one of the case studies. Based on the successful delivery of FW reduction over time by the Courtauld Commitment, the PCFWC is expected to deliver similar results once more signatories join.

#### **8.4.2. Stakeholder Compliance and Acceptance**

Stakeholder compliance by small and medium-sized grocers is not expected to be an issue for this policy option in the short term since grocers would be able to participate for the first two years at no cost. Thereafter, significant monetary cost is projected should they choose to stay on as a signatory over the long term; however, this choice is voluntary and the capabilities gained from the first two years can continue to work for them in the long run without having to stay in the PCFWC. Due to these reasons, monetary and administrative burdens are limited within the policy itself and stakeholder compliance receives a good score.

Acceptance by the other stakeholders also receive a good score. Large grocers are not anticipated to oppose this policy since joining is not mandatory and there is zero cost to join in the first year. Support is likely to be given by large grocers who are ready to commit to reducing FW; and by choosing to voluntarily join, the additional work and total fees in the long term must be deemed acceptable in their perspective, in return for the gains they will receive. Opposition is not expected by the other stakeholders either since they are not directly implicated by the policy, though it is anticipated that there might be less support by the public and food aid organisations for this policy compared

to the others because of its lower emphasis on social welfare than on environmental objectives.

### **8.4.3. Cost and Administrative Complexity for Government**

While the annual fee for the PCFWC is unknown, the present Courtauld Commitment provides a good basis for the cost analysis: Courtauld Associates are charged an annual fee of £3,500 each (approximately C\$6,040), and are intended for retailers with an annual turnover of less than £250 million and who may not have the time or expertise available to lead commitment initiatives but still want to join in the action (WRAP, n.d.). Using this information as the basis for the proposed policy, a grant of \$3,000 per signatory would be reasonable to lower the financial barrier for food retailers hoping to join a voluntary agreement in its early stages and with much fewer signatories than the Courtauld Commitment. Metro Vancouver would then be expected to set aside a maximum of \$60,000 (based on \$3,000 per grant for 20 eligible food retailers) to fund the grant portion of the policy, plus an additional \$2,000 annually on communications to food retailers through flyers or industry consultations. This policy is much costlier compared to the other policy options; however, the funding amount is relatively low and would make up less than 0.3% of the approved total grant expenditure (\$23,199,000) in the City of Vancouver's 2021 budget (City of Vancouver, 2021). In addition, administrative complexity is expected to increase in response to this policy in order to verify new PCFWC grocer signatories and issue grants. Thus, based on this analysis of cost and administrative complexity to government, the projected outcomes score as fair in these two criteria.

## Chapter 9. Other Considerations

First, my policy analysis in this paper does not include a comprehensive intersectionality-based analysis; however, I strived to apply an intersectional lens to identify potential concerns. For example, there are power imbalances between small and large retailers so greater attention is provided to small and medium-sized grocers in my case studies and in the selection and analysis of my criteria. I am also aware that my selection of environmental sustainability as the key objective may be a result of my positionality and privilege of being food secure. Thus, the incorporation of the societal objective of food security into the analysis through the FW solutions hierarchy was important. As a result, policies incorporating food donation to help in the redistribution of food to improve equity are prominent in my policy options. An intersectional lens also helped identify concerns for geographically remote food retailers where accessibility to food and food aid organisations can be a challenge so the mandatory food donation policy option provides an exemption. Lastly, another identified concern is that small food retailers are likely to employ visible minorities that may require more translated training materials and resources.

Second, I selected the PCFWC as the voluntary agreement in this paper due its support by the BC government, the City of Vancouver, and endorsement by WRAP, but there may be other voluntary agreements open to food retailers in Western Canada. A potential alternative for the region is a commitment led by the Provision Coalition and National Zero Waste Council, the latter of which has its roots in the region from being a leadership initiative of Metro Vancouver. This commitment stems from the collaboration of eight leading Canadian retailers and manufacturers to help in their public commitment to prevent and reduce FW in their respective operations by 50% by 2025. These Canadian retailers and manufacturers consist of large corporations and include Kraft Heinz Canada, Loblaw Companies Limited, Maple Leaf Foods, Metro Incorporate, Save-On-Foods, Sobeys Incorporate, Unilever Canada and Walmart Canada. This commitment is not currently a voluntary agreement open to other food retailers; however, there is potential for this commitment to be the leading one across Canada in the future since it already includes the country's largest food retailers and can easily be opened for others to join.

Third, I designed the food donation tax reduction policy to apply to property taxes in order for the policy to be municipally administrated and comparable to the other policy options. However, the tax reduction can be expanded to the entire province and managed alongside the BC Farmers' Food Donation Tax Credit to reduce income taxes instead.

Finally, reducing FW to absolute zero is not realistic for food retailers nor other actors in the FSC due to increasing marginal cost of investing in FW reduction and diminishing marginal returns. However, it appears that the food retail sector in Canada is still far away from achieving significant FW reduction since we have yet to measure or fully understand our retail FW generation. However, BC and Metro Vancouver may be warmer to these efforts based on the good work the region has achieved to date.

## Chapter 10. Recommendations

Based on the trade-offs, strengths, and weaknesses of each policy option identified in my policy analysis, I recommend that municipal administrations within Metro Vancouver permanently implement mandatory food donation and training, along with a food donation tax reduction, in the immediate future after stakeholder consultation. Implementing these two policies would be complementary: participation by food retailers is guaranteed by the mandatory policy, while the quantity of food recovered increases due to the financial incentive per pound of food given by the tax break. The first policy option also includes contract negotiation and mandatory training, which can help alleviate risks from the second policy option regarding food retailers dumping FW onto food aid organisations and fraudulently claiming the tax reduction.

In the medium term, I recommend implementing policy option three once some incentive to measure and track food waste has been established by the other two policy options. Not only will food retailers be more prepared to commit to greater mitigation but also based on my analysis, this third policy option has greater potential than the other policy options for the sustainable prevention of FW by retailers and beyond including manufacturers, distributors, restaurants, caterers, brand owners, and consumers.

## Chapter 11. Conclusion

Food waste continues to be a major contributor of greenhouse gas emissions, yet public policies to address food waste at retail, particularly small and medium-sized food retailers, remain understudied. To contribute to the knowledge in this area, this study sought and found that food waste mitigation practices of small grocers can be fairly limited compared to larger food retailers due to a variety of barriers, such as a lack of resources, priorities, and expertise to implement food waste mitigation practices in a manner according to the food waste solutions hierarchy. These findings suggest that policy interventions proposed in the study, which are based on specific food waste regulations, taxes, and voluntary agreements identified in the jurisdictional scan, must focus on lowering the barriers that small and medium-sized grocers face. Based on the analysis, these policy interventions all have the potential to address retail food waste without leaving behind small and medium-sized grocers.

Future areas of study for consideration include surveys to better understand, quantitatively, food donation participation and volumes by Metro Vancouver food retailers; expanding policy option two to involve all of BC so that the proposed tax reduction policy could be administered provincially; or expanding policy option three to include other small businesses beyond food retail, such as food service, for eligibility in the PCFWC grant. Lastly, should the policy recommendations proceed, other areas worth studying are the role of logistic companies on food donation in Metro Vancouver and the impact of additional food recovery on GHG emissions.

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## Appendix A.

### Causes and Prevention of Food Waste at Retail

Table A.1. Top 3 causes of FW at retail in each category and their mitigation practices.

Causes	Mitigation Practices
<b>Method-related</b>	
1. Stringent product quality standards	<ul style="list-style-type: none"> <li>• Flexible quality standards</li> <li>• Use of surplus by other channels</li> <li>• Management autonomy</li> <li>• Price and promotion policies</li> </ul>
2. Poor inventory control	<ul style="list-style-type: none"> <li>• Price and promotion policies</li> <li>• Inventory policy</li> <li>• Waste-reduction oriented operational systems</li> <li>• Product traceability</li> <li>• Collaboration with logistics partners and suppliers</li> </ul>
3. Lack of coordination / collaboration	<ul style="list-style-type: none"> <li>• Collaboration with logistics partners and suppliers</li> <li>• Coordination mechanisms in the FSC</li> <li>• Communication with FSC members</li> </ul>
<b>Measurement-related</b>	
1. Inadequate demand forecasting	<ul style="list-style-type: none"> <li>• More precise demand forecast</li> <li>• Demand management / history technology</li> </ul>
2. Excess products	<ul style="list-style-type: none"> <li>• More precise demand forecast</li> <li>• Demand management / history technology</li> </ul>
3. Lack of waste measurement	<ul style="list-style-type: none"> <li>• Nil</li> </ul>
<b>Material-related</b>	
1. Inadequate packaging	<ul style="list-style-type: none"> <li>• Packaging development and optimization</li> </ul>
2. Short shelf life	<ul style="list-style-type: none"> <li>• More accurate labelling information (expiry date)</li> </ul>
(Uncategorized to a specific cause)	<ul style="list-style-type: none"> <li>• Use of expired food products for other purposes</li> </ul>
<b>Machine-related</b>	

1. Cold chain breaking	<ul style="list-style-type: none"> <li>• Technology and sensors for food quality control</li> <li>• Application of thermal control in packaging and/or facilities</li> </ul>
2. Problems with transport equipment	<ul style="list-style-type: none"> <li>• Technology and sensors for food quality control</li> </ul>
3. Problems with storage (including location and capacity)	<ul style="list-style-type: none"> <li>• Technology and sensors for food quality control</li> <li>• Application of thermal control in packaging and/or facilities</li> </ul>
<b>People-related</b>	
1. Incorrect product handling	<ul style="list-style-type: none"> <li>• Employee awareness of waste</li> </ul>
2. Lack of employee training	<ul style="list-style-type: none"> <li>• Training for waste reduction / prevention</li> </ul>
3. Lack of knowledge	<ul style="list-style-type: none"> <li>• Employee awareness of waste and safe food handling</li> </ul>
<b>Environment-related</b>	
1. Very restrictive laws (tie)	<ul style="list-style-type: none"> <li>• Flexible laws regarding food safety and commercial standards without compromising consumer health</li> </ul>
1. Climate change (tie)	<ul style="list-style-type: none"> <li>• Nil</li> </ul>
2. Problems with seasonality	<ul style="list-style-type: none"> <li>• Nil</li> </ul>

(de Moraes et al., 2020)

## **Appendix B.**

### **Interview Transcripts**

#### **Interview 1**

**First, I would like to know, does the store separate and sort organic waste from general garbage?**

Yes, yeah. There are three kinds of garbage bins that we have in the back.

**And how are they sorted – the three different types?**

One for the cardboard, one for the other garbage, and there's the third one for the organics.

**How do the employees know how to do this? Is this part of their training or are there signs for it?**

Yeah. When the workers are trained, they are taught which garbage goes into which one. And all the workers at the end of the day, they take all the cardboard and leftover produce, which is not useable or eatable, they put in the different garbages.

**Do the employees receive other types of training when it comes to reducing FW?**

No, they don't. Well, I do have FoodSafe; none of the other workers do because they are not well-trained, but they do get training for only two weeks about everything.

**Sometimes, we don't think about it but training on how to display food to avoid food spilling can also be considered training for reducing FW. Are employees trained on how to display food so that it doesn't topple over?**

Yes, yes, yes, it's part of the training so the main worker who is responsible for all the other workers and who trains them, he takes care of it. He trains them how to organize the produce, which stuff needs to be in the fridge and which stuff needs to be outside. As I told you, we change the produce everyday so that's a part of his routine. He tells the workers what to do.

**That's actually included as a FW prevention method so that's great. Are employees also trained on when to start marking down the food? Is it just every day what was displayed the day before are put into those \$1 bags?**

It's every day, every morning we change the produce. It's not the day before. We change the produce every morning when they come in. They come in half an hour before and they note down everything: what needs to be changed first, and what needs to be displayed more professionally and more organizing. In the whole day they change everything, note whatever is going fast, they fill it up. We don't leave anything empty, so they just keep an eye on everything. Whatever needs to be filled in or whatever needs to be changed right away then they do it.

**Just so that I can be clearer in the question: do they employees take a look at the produce and decide this is still good to stay on the shelf for the rest of the day or this one looks a bit bruised, or it has a mark so I'm going to put it aside in that bag? Are they trained on how to look at the product?**

Yeah, they are trained in their training period on which stuff needs to be in the \$1 bags – the discount bags – and which stuff needs to be the shelf, which will last a couple of days. Yeah, they get trained for that.

**Okay great, I understand now, thank you. Does the company also have these policies written down on paper? For example, when to mark it down –always in the morning; how much of it or anything. Is it formally written?**

No, it's not written actually because the workers we have, have been working with us for a long time and they all know what to do. But whoever comes, we usually send them to another branch. Like I told you, we have 8 branches and I'm not sure about other branches but in our location, we tell them but we don't write them down on paper.

**Okay, understood. Does the company set FW reduction targets? Does the store measure how much food is wasted?**

No, we don't measure it actually. There are no targets. Whatever is leftover we just put them in those discount bags. We don't want to put them in the garbage, that's the thing. So we always try... we could, before it gets bad, before it gets rotten, we can sell it right.

So somebody can use it, so we don't put it in the garbage. We prefer to make the \$1 bags so people can buy it.

**That makes sense. At least try to get some profit out of that. Does the company ever donate some of the food?**

No, we don't.

**Would it be something that the company would consider? Would there be benefits for your store in maybe reducing the amount of FW that you would have to pay somebody to go pick up from your store?**

Sorry, I don't understand.

**Sorry, that was a big question. Would the company be interested in exploring food donation?**

I cannot comment here. I have no idea about that. It all depends on the Owners and the General Managers.

**Right, I understand. I was just curious, for example, in your position as an Assistant Store Manager, do you see benefits in food donation?**

Definitely. If we donate food, of course there is. I won't see much benefit for myself or for the store. It would be beneficial for the people who need the food, right.

**Absolutely. My next question is again on food donation. How would you feel if the provincial government made it mandatory for grocery stores to sign food donation contracts? Because that is currently a law in France for large supermarkets.**

I think it should be. If they make it as a law, it should be good for the people, and for the owners, and whoever owns the small businesses like the grocery stores. It's a good idea, I think, if they do donations because they can... I mean the food, like you know we sell for a dollar, sometimes people don't buy it. It's not like a couple of bags, it's like in bulk like in those boxes / big bins. If we donate that, it should be good for the people who we donate it to.

**What challenges do you think that would bring for your company if that became law? For example, would your company know who to donate to?**

Yeah, that's going to be a tough question because it's hard to see where to donate it because there are a lot of organizations that are already doing donations. For instance, we recently got somebody here in the store, and they were offering like if you do the donations, they were collecting locally. And I talked with my manager, but they said "no, we don't do any donations." So it might be that they're making money by selling them in the bags. If they donate it, they won't be, so that might be a loss for them.

**How would the company feel in terms of the legal issues if any of the food donated cause anybody to become sick? Would you see that as a challenge for your company?**

Yeah, that's definitely a challenge because we don't guarantee the produce because we don't grow it, right. Whatever we receive, we get a lot of complaints even in the store sometimes about the produce but when we don't cut it, we don't see what's inside. That's the producer's responsibility or the shippers. The containers they bring it in, sometimes the temperature is up and down. Things are not as they has to [should] be right. Actually, it's a challenge to keep the customers satisfied about the quality of the produce.

**Absolutely. Now I would like to ask you some other questions on what large retailers are doing. Some large grocery stores are using technology to reduce FW. For example, some retailers regularly scan the barcode of products that are going to be thrown out so they can collect information on what is being thrown out, why, and to track where some of these items go. For example, the larger supermarkets know that it's going to go towards donation or it's going to go compost. How easy or difficult would something like this type of technology be to implement at your store?**

I think it should be easier to do it that way. To keep [track of] it from person to person is pretty hard. If we use technology, of course it's helpful.

**Does your store have a scanning system?**

No. We have a scanning system but not for donation or something.

**Are you using it for inventory or for how much to buy?**

We do the orders for produce, we use those for inventory, purchasing.

**Another technology example that some grocery stores are using is a mobile application. There are some free mobile apps on the phone that connect grocers, grocery stores, to customers to provide real-time information on discounts for food that are approaching their Best Before Date. So for example, you would go on your phone, if as a customer, then you search different grocery stores like they have a 'happy hour' for food. It'll tell you how much produce they have and what time you can come pick it up.**

Like what's on discount, right?

**Yes. How likely is your store to participate in a program like that?**

I don't think they would be interested in this because we are always so busy. We sell the produce – whatever is on discount – very fast. Every day we make like a hundred of those bags and we sell them very fast.

**Is the demand very high? Are you able to sell through them very quickly?**

Well both, because some people just come to buy those bags. Because some can't afford to buy the produce and they pay a dollar and they get 5-6 pounds of fruit and that's not bad I guess.

**I understand. So using some sort of mobile app would just take more time from your employees to put it on?**

Yeah.

**Going in a different direction, what are your thoughts on the store conducting regular waste audits to control any overbuying and to inform your future purchasing?**

Could you explain the question please?

**Yeah, yes. So it would require an employee or hiring somebody to come in to take a look at how often you are wasting food, to measure it, to take a look at how much excess product is purchased but then not sold and then putting that together into a summary to say you can reduce your waste by this much and create this amount of savings, or you can prevent this much waste going into the landfill.**

No, we don't measure anything. Whatever is leftover even in the discount bags, by the end of the day, we just put them in the garbage.

**What are some of the challenges, you think, in setting up a system to have FW measured at your store? You have the bins to sort. What would be some challenges in actually measure it?**

Challenges would be the employees, actually, because most of the employees don't know English. That's the big challenge of my everyday life because it's hard to talk with them and it's hard to explain to them sometimes. Even in the customer service we get complaints that the workers cannot understand them. So it's hard to teach them all those things because they just understand their own language rather than English.

**Right, so a language barrier. But you do provide the training?**

Yes, we do provide the training.

**In your opinion, what actions do you think you would like to see from local or provincial governments or even like industry organizations to help small-sized grocery stores like yours to reduce FW?**

I think they should. It depends on whoever orders it. Most of the stuff comes from out of the country, especially from California. There's not much produce from local producers. I think that's the barrier. If we order from another country, then we order in more quantity. If we have the local food or produce, we could order as much as we want, it could arrive faster, we don't need to order it in more quantity, and it won't go bad.

**I understand. So ensuring that there's more availability locally would allow you to purchase more smaller quantities but in more frequent purchases?**

Right. More fresh. Yes. It would last longer.

**Are there any others? You mentioned that you have a scanning system but you're not measuring FW; would you like to see some sort of financial grant to have the store get-**

No, it's just that, it's about... The owners have to put focus on it. They just don't care about this. They need to take care of it.

**Right, so FW prevention is not a priority at the moment.**

Not at all.

**I see, I understand. Are there any other actions that your store takes specifically to reduce or divert your FW from landfills?**

No but we do in the grocery store have some products like canned, or stored in jars, and all those things. We don't garbage those things as whenever we see them getting expired, we put those on the sale as well, which if we reduce the price, we sell them before they get expired. Like six months prior, we put them on the sale.

**Right, part of inventory control. Is there anything else that I might have missed?**

I don't think so.

**That's great. I'm just quickly going through my list of questions here. You've provided a lot of good information, thank you so much.**

No problem, take your time.

**I think that's all I have for you. That's all the questions I have. Do you have any further comments that you would like to add on what we have already discussed?**

No, that's all I guess.

**Okay, great. Thank you so much for taking the time to speak with me.**

## **Interview 2**

**How many people work at [grocery store #2]?**

Right now, between our three locations and our head office it's just over 100.

**Does [grocery store #2] sell online as well or just the brick-and-mortar stores?**

Just brick-and-mortar stores. We do use Cornershop – not sure if you've heard of it. We put our products on Cornershop and they have pickers – I mean shoppers – that come to the store and pick stuff. So that would be the only online way to purchase some of our products. We put limited items on there.

**Okay, that's good to know. The first question I have here is do the stores separate and sort organic waste from general garbage?**

Yes, each of our stores. The New West one, we're part of [commercial district] and they have a company that manages organics. They have the organics bins, cardboard, plastics... We're part of a shared strata / small strata – same as POCO (Port Coquitlam) – and they all have organics, cardboard, plastics... everything is separated.

**Are the employees trained to do this or do they receive other types of training when it comes to reducing food and organic waste?**

As for that, it's pretty self-explanatory. Like, when they're working in produce, the organics go into the organics bin and some grocery items. As for training, we usually train... Your question about training employees reducing food waste: for example, employees are trained to rotate products on shelves. You have the oldest products in the front or on the top and the newest on the back, so they won't spoil. Even though at the rare time you have a staff that is lazy or doesn't do it, you might have an item trapped in the back... that's one thing. The other thing, they're trained not to overstock the shelves. When you start overstocking, let's say produce, you put too many bananas on or something, it'll cause spoilage as well. As for sensitive products that tend to spoil quicker, say for produce – that's always the example – we would tend to put those items in the cooler to prolong the life of products or keep them outside. But then products that are okay to last a long time at room temperature, we would keep them in places that don't need to be in the cooler.

**So employees are really trained on product quality and maintaining that temperature.**

Yeah.

**Are there specific actions, other than what we've discussed already, that the company does to manage FW? For example, do you have a discounting practice for perishable foods that are near their end of shelf life?**

Yes. For that, we usually, of course. Say apples or bananas getting soft or wrinkly, we would bag them in \$1 bags, and they would move out the day of, basically. A lot of people don't mind wrinkly products or products that are going to spoil soon because they use it to make jam, or freeze it, or some of them feed it to animals as well. Also, we use some produce if we know it's going to spoil in the next couple days or soon: we do prep[are] it in ready-to-eat packages. We cut up like a cantaloupe; say there's a little bit of spoil or it's going to go spoiling, we cut it up into pieces that are good still and we sell it to customers in a ready-to-eat container. We also do some donations too. We do donate; sometimes ReFood comes by to pick up. You've heard of them probably. Also, there are some farms that come by. They have bunny farms, and we give them the carrot tops and stuff instead of throwing them into organics and they go feed their bunnies. And we also use, as you mentioned, Too Good To Go app. That's something we started recently. That's a great anti-food waste app for businesses.

**Yeah, it's fairly new, so good to hear you're on it. Regarding the discounted foods and the ready-to-eat packs, how well do these items sell and do they sell quite quickly too?**

They sell quite quickly because people, when they're grabbing their lunch, want something quick, like some cut-up watermelon or cantaloupe or honeydew... even grapes and blueberries. Sometimes we have things that are half kind of spoiled already, that may have bits, but then we can save the rest of it. We'll pack the good portions into the ready-to-eat containers. And they sell for like \$1.99, \$2.99, or \$3.99 and customers are usually pretty responsive to those.

**Good, good. I'm hearing the store has some in-house processing capability. Was that always the case or was there some sort of driver that was related to FW that drove this initiative?**

When we first opened, for example New West, we didn't have much of that option. But then, as time went by, owners trying to save costs, recover as much product because that's money down the drain when you throw out product. So having that ability to repack and recover some product losses and reduce food waste is something that I think all businesses tend to try their best to do now.

**Absolutely, food recovery is good in so many aspects, financially and socially, so that's good to hear. Are these initiatives or policies that you've talked about, are they officially written?**

They're not, to be honest. We are considered a smaller retailer / small business chain. We may have 100 staff between four places but at any time there could be 10 working at a store or maybe 20 depending on the rush. Especially at this time, and day and age, trying to maintain employees and a lot of people sick, everybody's wearing many hats. Like, even myself, I may have to hop on cash just to support stores because two to three cashiers are sick and because we just don't have the same amount of resources as the big box store where one store will have 100 staff instead of split between four places.

**Absolutely, that's why I'm doing this study because small grocers are completely under different constraints than larger retailers that have sustainability reports so it's very different. So that's why I'm doing this study actually and it's a good thing that you brought it up.**

Yeah also, a big thing is that a smaller store like us would have less waste than a big store like a Superstore, Walmart... They would have a massive amount of waste, I would assume, just due to the magnitude of their business.

**They're market share is definitely different. So this brings me to my fourth question. You've already touched upon food donations. How would you feel if the provincial government made it mandatory for grocery stores to sign food donation contracts?**

We would support it, that's because we do it already. It's a great way to support your community as well. I mean it reduces your food waste and it's a feel-good thing, right?

**I understand. I'm not sure if you were around when [grocery store 2] started donating food but do you know if it was difficult to setup? Like, finding organisations or just figuring out the logistics, was that difficult to setup?**

Maybe five years ago when companies started to approach us, different ones, but I don't remember their names. There were a couple ones, they made it easy for us. I usually give an example, like ReFood, because there's a bakery there and some restaurants and they'd just go by and ask, "is there anything to pick up this week?" Some weeks there won't be any, but some weeks there would be a box of potatoes or a box of something that's going to spoil soon. They make it easy for us. We just put it in a box and tag it with "ReFood" on it and they would come to pick it up. It would be pretty easy to do but we wouldn't manage it. We wouldn't mark down how many pieces of this we put in, or of this. We wouldn't have that resource to manage that further. We would only throw it in a box and you guys take it, kind of that way.

**Right, understood. In your role, are you concerned of any sort of liability with donations?**

No, I mean they would communicate with us if it was really bad. But then our produce staff have reasonable common sense to know what to give and what not to give. There haven't been any issues.

**Right, they're already trained on that in-house. Right, understood. Moving on to the fifth question here. How prepared would the company be to set FW reduction targets? This is something the larger food retailers are doing and they're communicating it out to the public.**

I think that for smaller companies like us, we might need some support in resources or tips to making it easier to manage. Like I was just mentioning before, if we had to mark down every single item we put in, and what it was, and it was going to be spoiling, it might be labour-intensive. Say that person working in our produce section, they have to go retail product, merchandise product, and then also hop on cash. They may have to do cleaning duties, they may have so many things on their plate already because smaller

businesses, we do have really tight margins and we try to run with not excessive amount of staff. Everything is so expensive. Expenses from hydro to all the taxes we have to pay, and products are continually increasing in price. The resources would be a little bit harder for us, I would say.

**Understood, thank you. You talked about a lot of record keeping. So in my sixth question here regarding technology to reduce FW, for some of the larger retailers, they're scanning and collecting data on what is wasted and why, to be able to track the final destinations of these items. You already mentioned about the resource constraints so it would be difficult to implement at your store. So I'm just going to change the question a little bit. What would help facilitate measuring and tracking of the store's FW?**

I guess if the government provided resources or funding a little bit, not like a lot. That would help. **[Like a grant?]** Yeah, like a grant. Like, you're doing it and if you show you're doing this, and record keeping and you provide the evidence, then they would provide a grant to get the ball rolling, you know?

**So that brings me to question number eight. What are your thoughts on the stores having regular waste audits? An audit can also measure the amount of FW generated, of course, just one snapshot in time. But what are your thoughts if the government were to implement that instead?**

For a smaller business it would take some time getting used to. It would be a little uncomfortable at first. It's kind of like getting a health inspector come by. Making sure everything is in line, standards are up. But that would help businesses run better in a way too, help them out. If the stores are having too much food waste, they can provide tips and resources to help them lose less [food], lose less money, help businesses grow. It is new forward thinking. People should / would have the mindset getting into that. At least for our business, if that were to happen, we would be all in. We would try our best to make it happen for sure.

**Another option instead of having that burden of the government coming in because you mentioned it's similar to a health inspection. What are your thoughts on if these waste audits were conducted, it would be voluntary for your company**

**to go out and solicit a third party to conduct these waste audits or environmental audits for you?**

If it didn't cost the business any money, and they would be able to do that, then we would be open to that.

**That's a good point, right. Understood.**

It's really tough. Let's say there was a service available and we had to pay for it. It is good for the business but it's really tough for smaller businesses. It's like a marketing company coming in presenting all these opportunities to promote your business do better. It's really tough when you're running with so much lower margins and funds. It's different aspect from a big box store.

**No, that's a good point. From what I gather, it sounds like financial support would be prioritised over these other options for your company. Like if you were to get a grant to improve your inventory system so you can scan the products to measure FW, that would help your store track it better.**

Yeah that definitely help push it.

**Excellent. So there's only a couple of questions left. Regarding like the Flashfood and Too Good To Go – these free mobile applications – it's great to hear that [grocery store 2] is participating in them. Have you noticed any challenges or do you have any thoughts on ways to improve more small grocers to participate?**

I just met Too Good To Go a month and a half ago or close to two months. The app is very thought-through and it's very easy to use. That's what we did notice. Like you could schedule pickups and everything. The only thing was as for our business, they're all about putting those 'mystery bags' out and not every day I have one. If I had mystery bags everyday, I'd probably wouldn't be in business because I'd be clearing out everything. They will want us to put as much on there as possible but it's inconsistent. Some weeks I may have a couple bags but some weeks now have nothing. Maybe the following I will have nothing but the following other week, I will have something again. So it fluctuates. I haven't gotten to the summer yet because the summer we'll have some produce. I mean it's so hot, the produce spoils faster than the winter. In wintertime, it's usually minimal but otherwise, the app's so easy to use, I think. They also promote by

giving you codes to encourage staff to start using it as well, which helps. Like a free mystery bag.

**Do they stipulate how much and how frequent you have to list products on the app?**

They encourage me to list something every day. Maybe not put everything on one day but to list it on multiple days so you get more coverage, like your name pops up on their app more frequently.

**But it's not mandatory?**

Not mandatory. They do understand.

**That's good. What actions would you like to see, that we haven't talked about, from the local and provincial governments or industry alliance organisations to help small and medium-sized grocers like yours reduce FW?**

To encourage and to educate more. To provide material. The government can provide materials to businesses. And if there are any grants available. As for our part, all we can do is put up posters in the stores and show staff and customers about using Too Good To Go app. About educating about food waste. It's growing rapidly, I think, just by having that meeting with Too Good To Go app, just in a couple weeks, across Canada, they have 8,000 followers across Instagram or more.

**There's definitely momentum with FW reduction, I think. With small grocery stores, I have noticed, personally being in them, I noticed real estate. It's difficult to post everything up because well a lot of the product you want to present it for the customer, the prices and everything. In your opinion, is it difficult for the company to educate customers on FW?**

From the aspect of FW, if you're promoting it then the customers may think you have a lot of waste as well. And also, they may perceive your business as sometimes more... When I was presenting the Too Goo To Go app, I had one of the owners ask me the question of "would that attract more clearance people looking for reduced [prices] and bring down our brand that way? And promote it heavily that way?" It was just the

question asked and it crosses our mind too. Are we a business that causes a lot of waste? Do we want to bring that to the forefront of our business?

**Right, there are multiple ways of looking at how these initiatives can help or can cause your brand to show an inferior product side so I definitely understand that.**

But if you have that on the side... It needs a further meeting with management and ownership to decision how far we want to take it.

**Thank you so much for your time. I believe our time is up. Do you have any further comments that you would like to add on what we've already discussed?**

No, I think you've covered everything in your questions. Just speaking with you, brings my mind more forefront about food waste and gave me some ideas for the future.

**That's great, thank you so much.**