From Farm to Fork to Landfill:
Food Waste in Toronto

Ryerson University

Aalokita Singla // **Gursewak** Singh // **Haifa** Al Harz

THE PROBLEM LANDSCAPE

Across all stages of the food supply chain in Canada, the per-capita food loss and waste (FLW)* as of 2018 is 396kg per person, per year. Of that number, 122 kilograms (31%) is from fruits and vegetables alone.

As the Canadian system of food waste is immensely widespread and complex, this visual map will solely focus on the journey of fruit and vegetable waste in Toronto, Canada. Beginning with identifying the root causes at each stage of this system, this map introduces the challenges, gaps, and opportunities for stakeholders in food waste management. .... *Start the journey here!*

* The FLW Protocol is a global accounting and reporting standard for quantifying food and associated inedible parts removed from the food supply chain.

Sally Spec-Tater
With a growing community of business owners and residents invested in environmental sustainability, systematic change in food waste is possible in Toronto.

FARMS

» Farmers plant and harvest their produce depending on orders from their retailers.
» When market prices are low, farmers leave fields unharvested.
» Farmers leave fruits and vegetables to spoil in the fields based on their cosmetic appearance.

10% FLW
In Ontario alone, 25 million lbs. of fresh produce are left to waste on farmers' fields during each harvest.

FOOD PROCESSORS

» Both edible and inedible parts of food will be trimmed before packaging.
» Manufacturers' definition of food waste vs. by-products is unclear.

20% FLW
Processing plants lose about 16% of their raw materials during manufacturing.

DISTRIBUTORS

» Food waste is produced through improper handling or poor management conditions.

4% FLW
Temperature and relative humidity of the truck can lead to the deterioration or contamination of stored products.

GROCERY RETAILERS

» Fluctuating consumer demand leads to an estimated $175 million of wasted produce.
» Overstocking and improper stacking leads to damaged produce, handling or poor management conditions.
» Consumers avoid purchasing bruised produce, reinforcing cosmetic standards in industry.

10% FLW
Quality control standards can cause retailers to discard perfectly good food (e.g., "best before" labels).

BIG Box Store

FOOD SERVICE & RESTAURANTS

» Leftover food from customers is discarded.
» Over-preparation, false sales forecasting, and excessive stocking leads to food being spoiled in storage.

9% FLW
Quality control standards requires food to meet certain standards set by management. In addition, restrictions on donation practices set by local laws to ensure food safety can lead to unnecessary food waste.

HOUSEHOLDS

» Bulk purchasing of food leads to food spoilage.
» Expiry dates and other labels cause confusion, compounded by lack of awareness about food quality.

47% FLW
The average Canadian household wastes about $31 per week, or $1,600 per year, through food waste.

In the US, confusion over date labels is estimated to account for $29 Billion USD of wasted consumer spending per year.
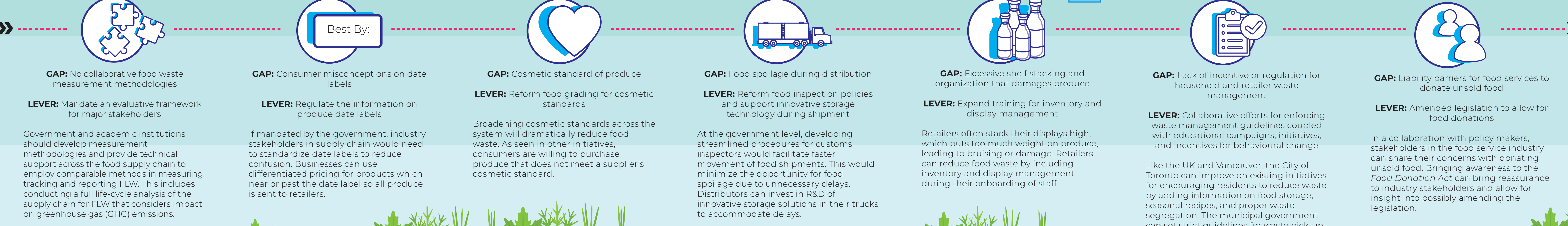
WASTE PICKUP AND DISPOSAL

» Food waste that is not sorted prior to pick-up is sent directly to landfills.
» Food waste sent to landfills is compressed with other waste, and over time, produces methane.
» Current processes are rushed and do not produce effective compost.

In 2014, the Ontario government reported that food and organic waste made up one third of Ontario's total waste, and nearly 2.4 million tonnes was sent to the landfill.

Mapping the Solutions Landscape

Globally, interventions at various stages of the food production journey have been made through both government/public and private sectors.

Belinda Li, Food Systems Lab, UofT
A way to reduce food waste is to see how food is made.. 'When people start seeing that, they'll think, 'Maybe I can still eat that, or I will buy less'. It shouldn't be hard to do a good thing.

@WRAP_UK
#EarthDay2018: Shocking fact: More than 1 BILLION tons of food goes uneaten each year. Reducing #foodwaste and loss = conserving #water, reducing #GHGs and ensuring food security. Time to ramp up action to halve food waste by 2030 #Champions123

@FAOKnowledge, Food & Agri., United Nations
Ready for the bin? Actually, no! Under the black peel, you'll likely find a ripe banana that is fine to eat! Peel before you throw! #foodwaste

@FeedingAmerica
25-40% of food grown, processed and transported in the U.S. will never be consumed due to waste, yet 41 million people face hunger. We need to get this food into the hands of people who need it. #foodwaste #foodrescue

@TammaraSoma, Food Systems Lab, UofT
Technological solutions to post-harvest #foodloss does not always have to be complicated, a simple fruit pulper allowed small farmers in Kenya to reduce waste by making mango juice, jams, mango leather

Here's what experts have to say

Industry Interventions

Social entreprises, like *Imperfect Produce* (San Francisco) and *The Misfits* (Alberta), provides a channel for consumers to purchase "ugly" produce. *The Ugly Revolution* (France) sold 1.2 tonnes of produce in the first two days of its campaign.

Companies like Morrisons, a supermarket in the UK, have set targets for environmental sustainability during their processing stage. Morrisons has donated unsold food that is still safe to local community organisations.

To address one of the challenges with the distribution stage, *Food Cowboy*, a mobile application (USA), was developed to safely route surplus food from wholesalers and restaurants to food banks instead of landfills.

Across Canada, Loblaw Companies Ltd. has set a target to reduce their carbon footprint by 30% by 2030. This includes improving their diversion rates from 61% to 80% in corporate stores and reducing the intensity of transportation emissions.

Government Interventions

Through policy and innovative technology, Germany was able to reduce its landfill sites from 50,000 in 1950 to only 300 today. These sites are mandated to only accept sorted waste.

The United Kingdom launched the *Waste Reduction Action Plan* (WRAP) to encourage retailers and their suppliers to identify collaborative approaches towards reducing food and packaging waste.

Inspired by a campaign led by WRAP, which reduced food waste in households by 21%, the City of Vancouver launched *Love Food Hate Waste* to share information on food storage, creative recipes and meal planning options.

The federal government in France legislated a ban on the disposal of unsold food, which drove donation to reduce food waste.

Under new legislation in Ontario, the province is establishing a producer responsibility regime. In the City of Toronto, a *Long-Term Waste Strategy* was introduced to guide the city over the next 30-50 years, committing to 70% diversion of waste from landfill.

GAPS & LEVERS OF CHANGE

Any approach for systemic change must consider all intersections of each challenge.

GAP: No collaborative food waste measurement methodologies
LEVER: Mandate an evaluative framework for major stakeholders

Government and academic institutions should develop measurement methodologies and provide technical support across the food supply chain to employ comparable methods in measuring, tracking and reporting FLW. This includes conducting a full life-cycle analysis of the supply chain for FLW that considers impact on greenhouse gas (GHG) emissions.

Best By:

GAP: Consumer misconceptions on date labels
LEVER: Regulate the information on produce date labels

If mandated by the government, industry stakeholders in supply chain would need to standardize date labels to reduce confusion. Businesses can use differentiated pricing for products which near or past the date label so all produce is sent to retailers.

GAP: Cosmetic standard of produce
LEVER: Reform food grading for cosmetic standards

Broadening cosmetic standards across the system will dramatically reduce food waste. As seen in other initiatives, consumers are willing to purchase produce that does not meet a supplier's cosmetic standard.

GAP: Food spoilage during distribution
LEVER: Reform food inspection policies and support innovative storage technology during shipment

At the government level, developing streamlined procedures for customs inspectors would facilitate faster movement of food shipments. This would minimize the opportunity for food spoilage due to unnecessary delays. Distributors can invest in R&D of innovative storage solutions in their trucks to accommodate delays.

GAP: Excessive shelf stacking and organization that damages produce
LEVER: Expand training for inventory and display management

Retailers often stack their displays high, which puts too much weight on produce, leading to bruising or damage. Retailers can reduce food waste by including inventory and display management during their onboarding of staff.

GAP: Lack of incentive or regulation for household and retailer waste management
LEVER: Collaborative efforts for enforcing waste management guidelines coupled with educational campaigns, initiatives, and incentives for behavioural change

Like the UK and Vancouver, the City of Toronto can improve on existing initiatives for encouraging residents to reduce waste by adding information on food storage, seasonal recipes, and proper waste segregation. The municipal government can set strict guidelines for waste pick-up to ensure that waste is sorted properly.

GAP: Liability barriers for food services to donate unsold food
LEVER: Amended legislation to allow for food donations

In a collaboration with policy makers, stakeholders in the food service industry can share their concerns with donating unsold food. Bringing awareness to the *Food Donation Act* can bring reassurance to industry stakeholders and allow for insight into possibly amending the legislation.

By understanding current and potential gaps within each stage of the food production process, we build a more holistic and broad picture for addressing the issue of food loss and waste.

The approach should include developing a collaborative plan with all stakeholders that build on working towards food waste reduction and diversion from landfills. For example, academic research from can support government to frame legislations and policy change with active participation from suppliers, retailers and residents.