



In 2023, the BC Department of
Agriculture and Food spent
\$292 Million ¹



Annually ~**4.17 Million Tonnes** of
food is wasted in BC²

Feeding 9 Billion Case Competition 2024

Harvest For Hope BC – A Government Led Food Rescue Program



Building a Sustainable Food System while Combating Food Insecurity and Food Waste

Presented By

J3M
Consulting



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What are the Drivers of Food Insecurity in BC?

"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."³

As of 2023, **~22% of B.C. Residents** live in some form of Household Food Insecurity³

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Policy & System Gaps

Social programs are being exhausted as funds lack targeting and have yet to slow the growth of people in need



Structural & Social Factors

Current systems in place do not address direct physical access to food or have inefficiencies in them



Economic Factors

Employment issues and low wages paired with already rising costs of living have greatly inhibited food security

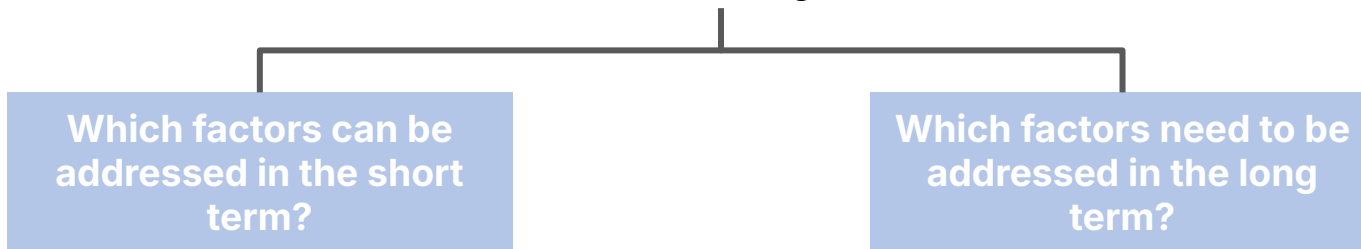


Climate Change

Changes in weather and climate conditions have affected crop yields and inhibited supply chains to communities

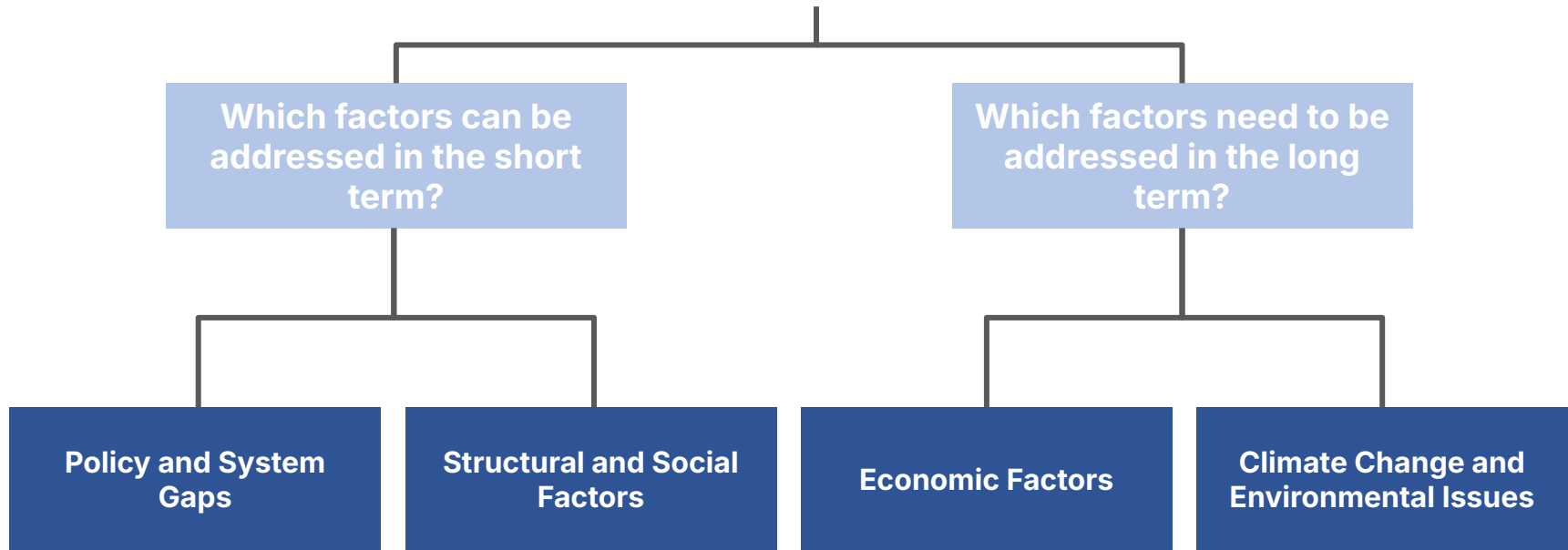
What are the Drivers of Food Insecurity in BC?

How can you address Household Food Insecurity in BC?



What are the Drivers of Food Insecurity in BC?

How can you address Household Food Insecurity in BC?



What Solutions Could the BC Government Implement?



Universal Basic Income

The BC Government would distribute funds to individuals facing food insecurity through scheduled cheques or food vouchers.



App Based Food Distribution

Partner or create an app that connects restaurants and grocers with food to people at a lower price to reduce food waste.



Expanding Food Banks

Fund the expansion of food bank funding and locations to meet geographical and supply needs.



Producer Focused Food Redistribution











Bridge the gap between food producers who have overproduced goods and people in need.



What Solutions Could the BC Government Implement?

	Impact on Food Insecurity	Stakeholder Buy-in	Sustainability	Equity and Accessibility
Universal Basic Income				
App Based Food Redistribution				
Expanding Food Banks				
Producer Focused Food Redistribution				

What Solutions Could the BC Government Implement?

	Impact on Food Insecurity	Stakeholder Buy-in	Sustainability	Equity and Accessibility
Universal Basic Income				
App Based Food Redistribution				
Expanding Food Banks				
Producer Focused Food Redistribution				

Analysis

Proposal

Implementation

Impact

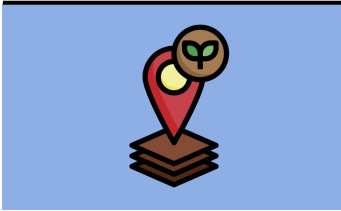
What Solutions Could the BC Government Implement?

	Impact on Food Insecurity	Stakeholder Buy-in	Sustainability	Equity and Accessibility
Universal Basic Income	 UBI when not properly implemented can result in high startup costs and negative economic growth in the long term			
App Based Food Redistribution				
Expanding Food Banks				
Producer Focused Food Redistribution				

Creating a New System for Food Distribution

The Current Process

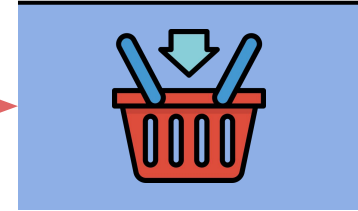
Producer (Farms)



Marketplace



People



30-40% of farm produce never reaches the market⁴

30% of produce is discarded for not meeting aesthetic standards

17% of BC families can't afford fresh produce⁵

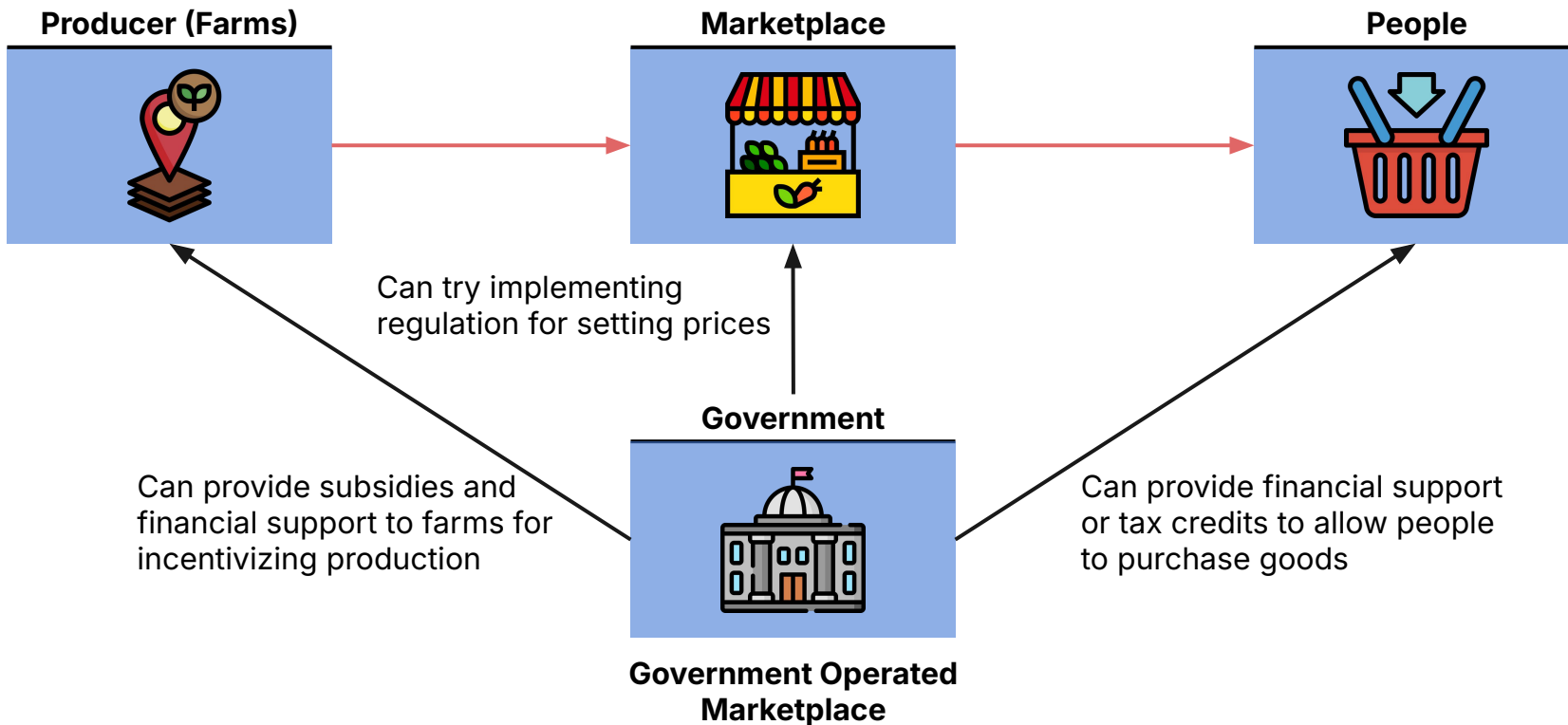
Limited infrastructure for redistribution

Rising costs make fresh food less affordable for families

Rural areas face significant accessibility challenges

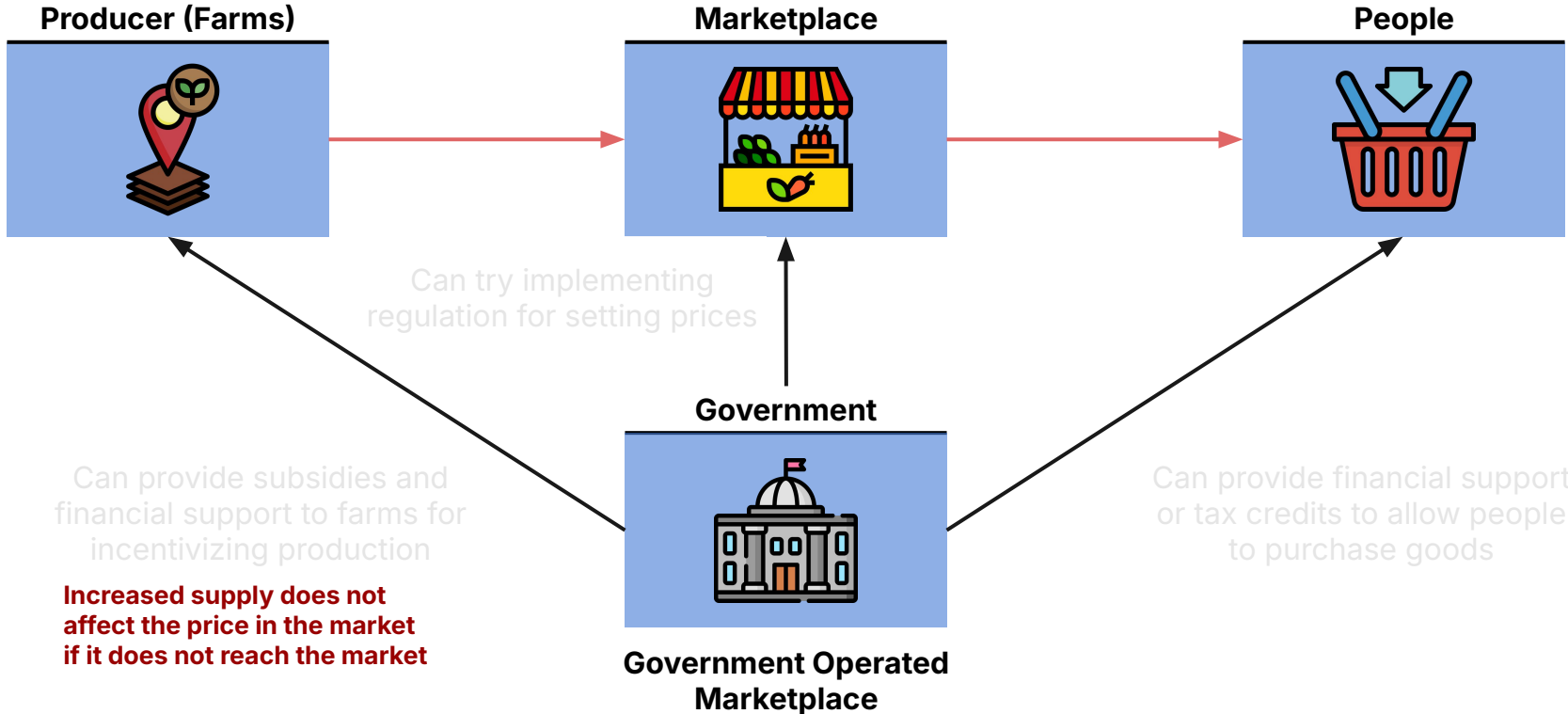
Creating a New System for Food Distribution

The Solution Identified



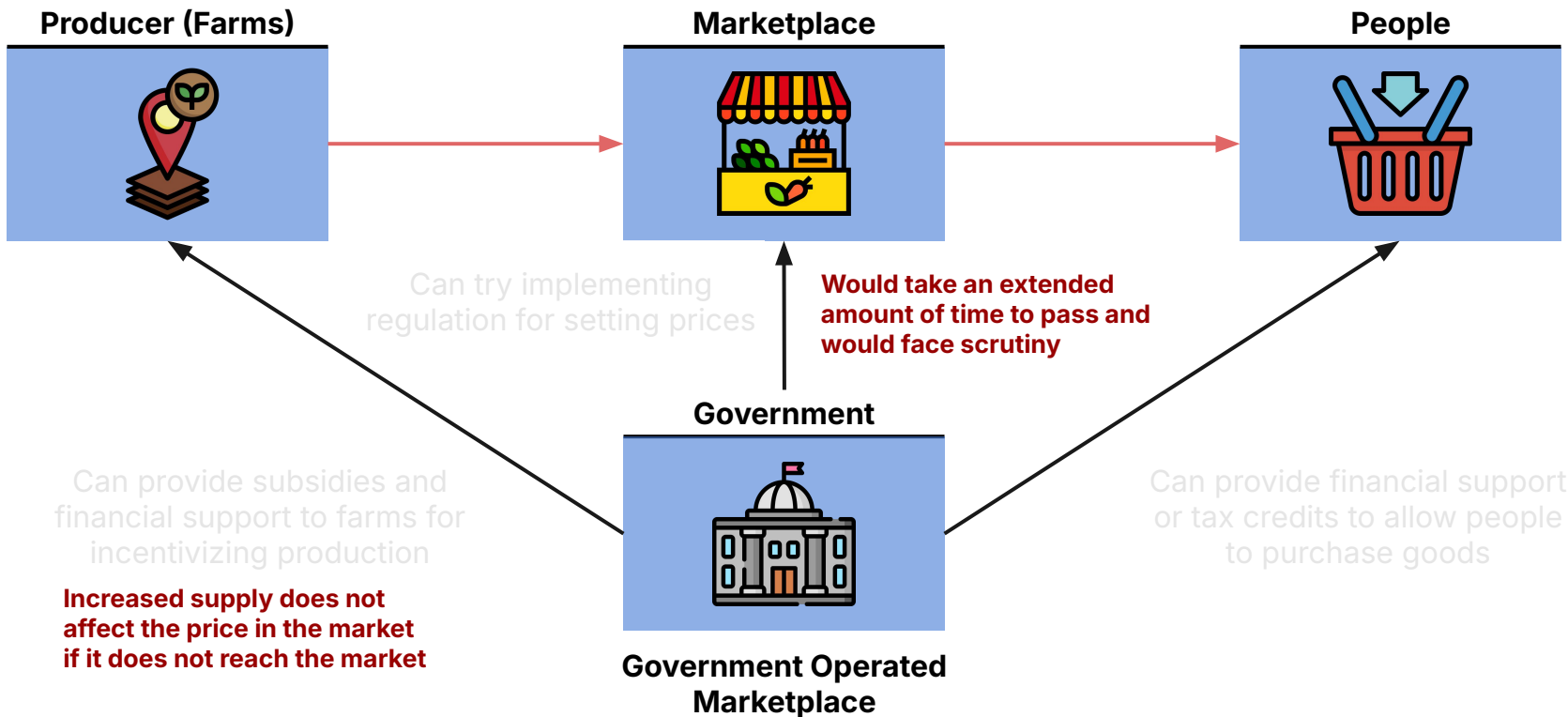
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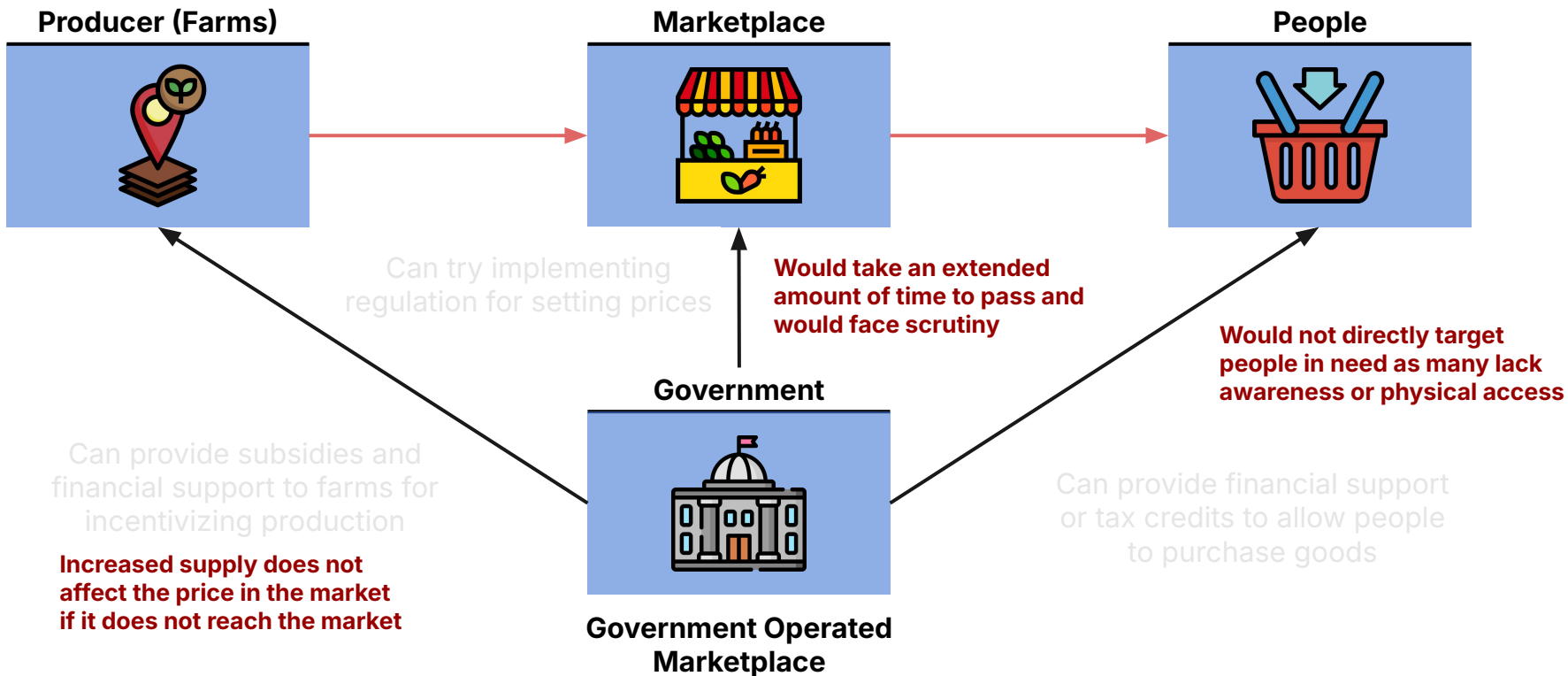
Creating a New System for Food Distribution

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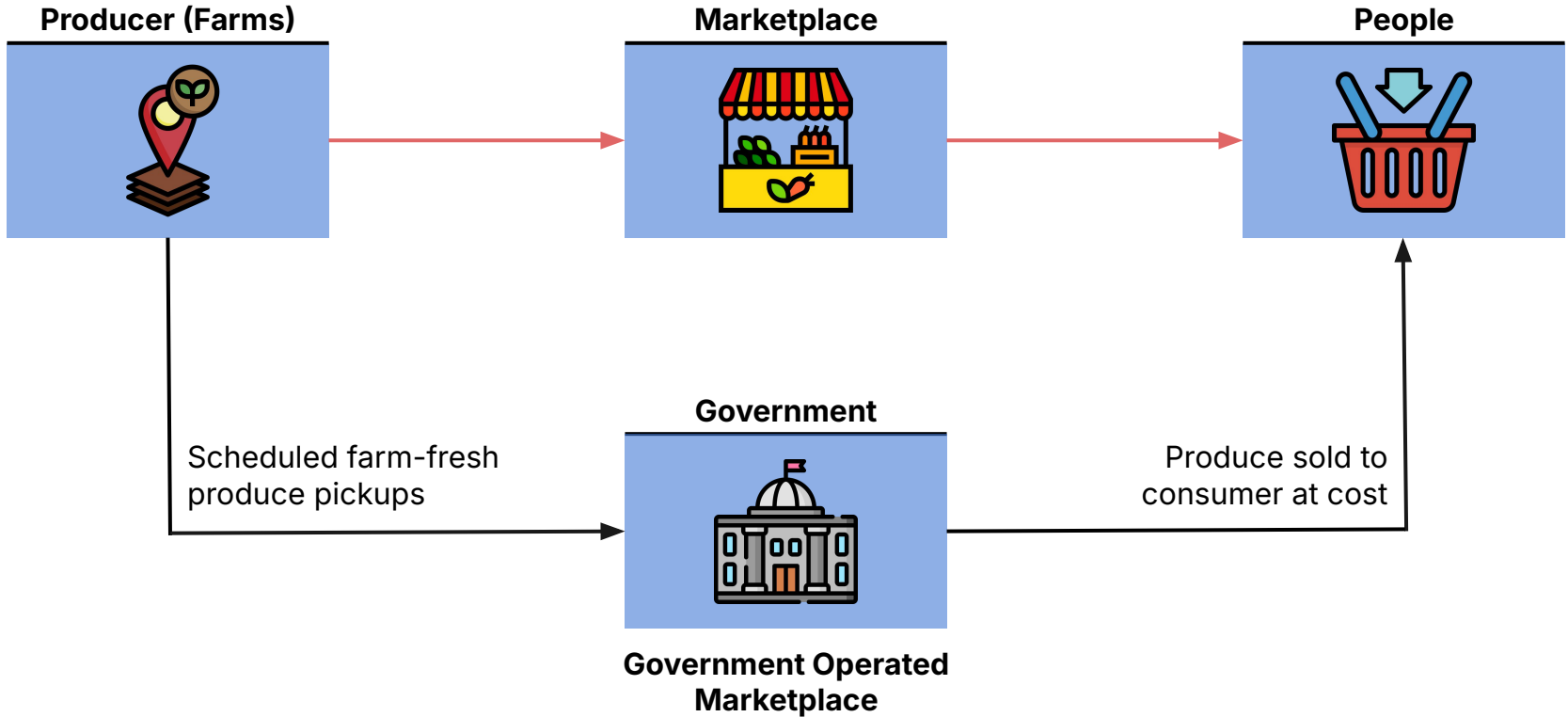
Creating a New System for Food Distribution

The Solution Identified



Creating a New System for Food Distribution

The Solution Identified



Creating a New System for Food Distribution

Key Challenges

Outcome



Efficient Transportation for Food Distribution



Producers (Farms)

- Collect surplus produce directly from farms
- Utilize hybrid or EV trucks to minimize emissions during transit

Analysis

Transport to
warehouses



**Warehouse
Distribution Centers**

- Distribution centers are strategically located near marketplaces
- Collaborate with Second Harvest and Food Stash Foundations to share resources and reduce logistical costs

Proposal

Distribution to
communities

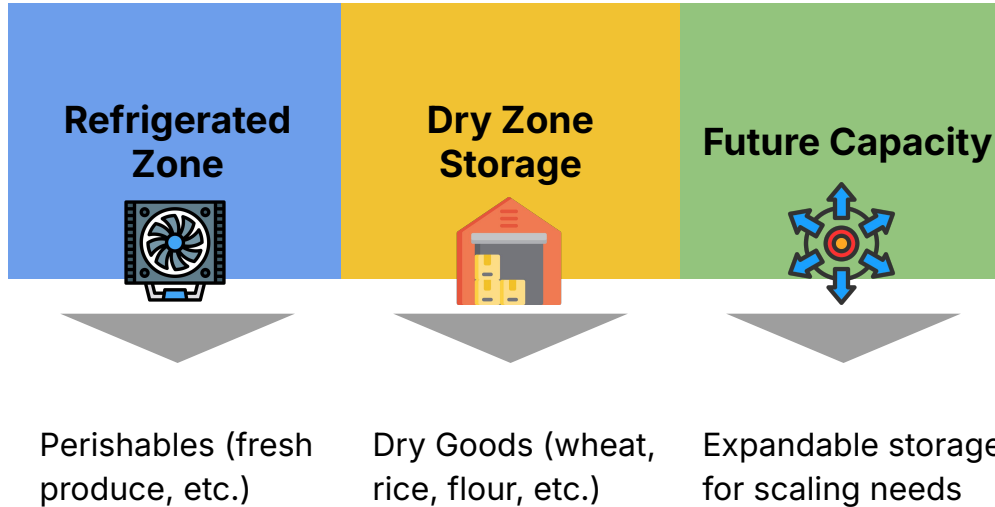


**Government-owned
Marketplaces**

- Serve as central hubs for subsidized food sales

Impact

Storage Warehouses



To ensure all communities across the province have access to essential resources, *strategically located* storage warehouses will be established, providing equitable support to marketplaces in both urban and rural areas.



Equitable Food Access for All

Indigenous communities in BC face significantly higher rates of food insecurity compared to other groups. In 2017–2018, the prevalence of food insecurity among Indigenous households was more than twice the prevalence of food insecurity among other Canadian households (28.2% compared with 12.7%).



Rural and Remote Communities

- Focus on implementing government-owned marketplaces in remote areas with high indigenous populations.
- Establish mobile storage units to address limited infrastructure.

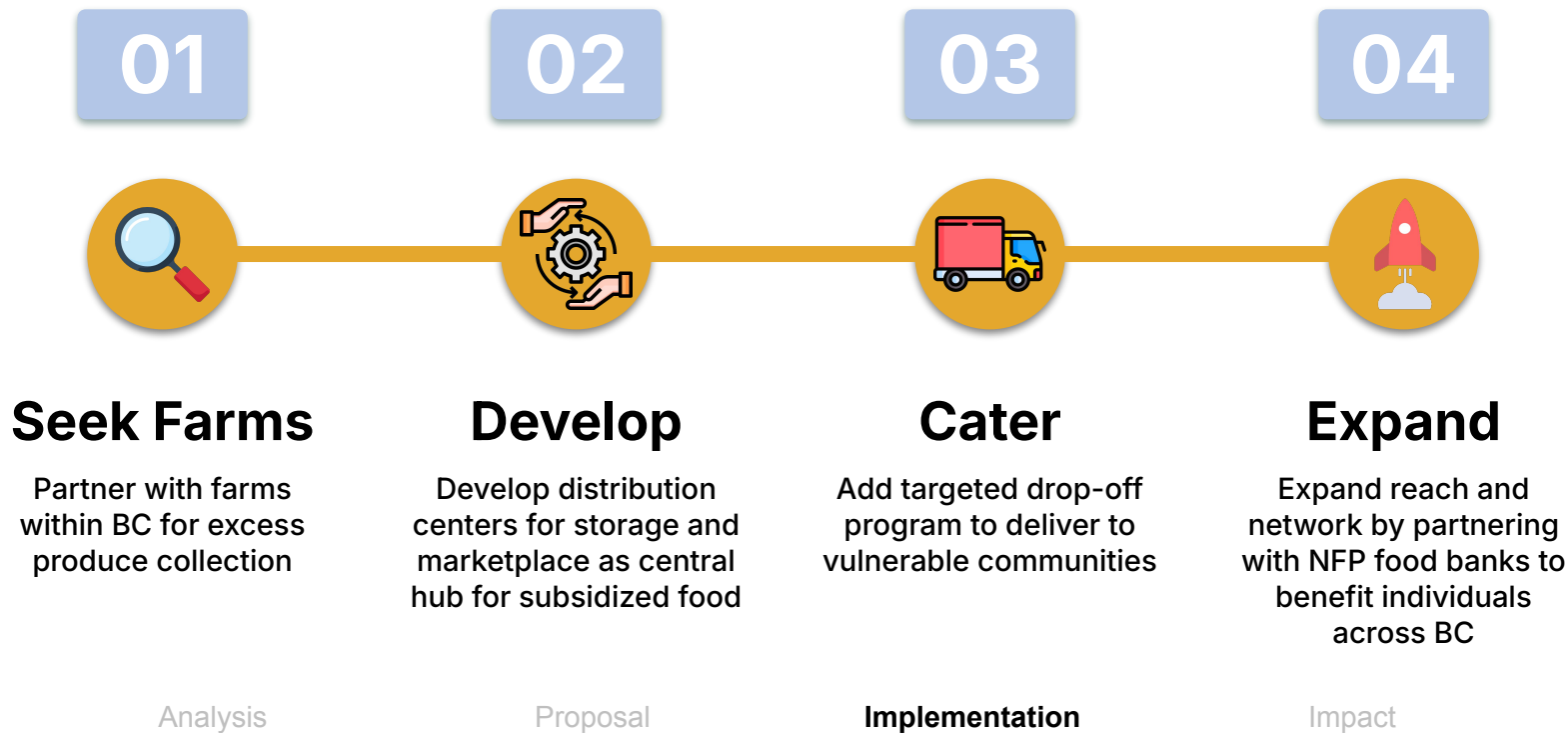


Urban Communities

- Leverage partnerships with local organizations such as Second Harvest and Food Stash Foundation.
- Establish marketplaces in high-density areas with high populations of marginalized communities.

What are the steps to harvest?

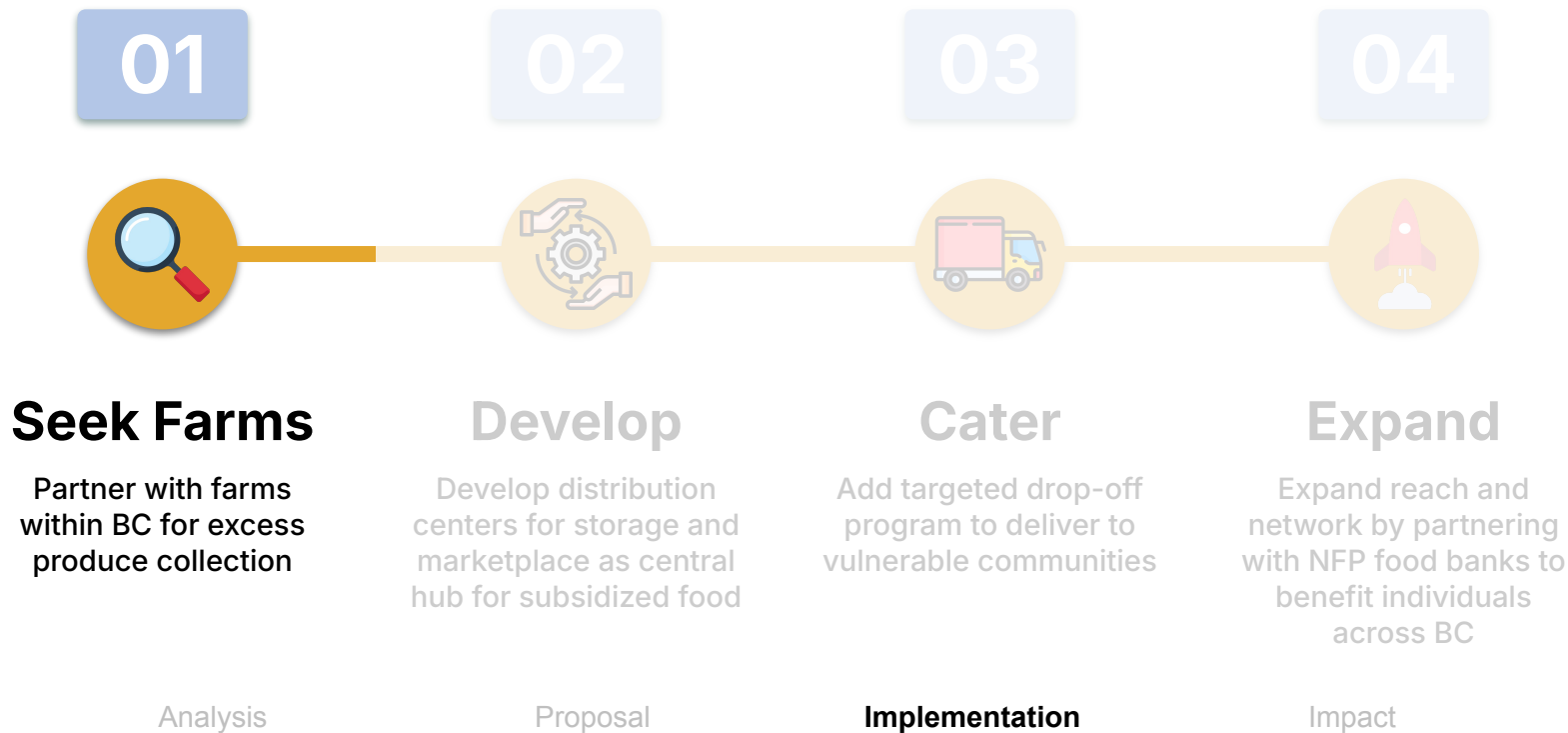
General Timeline



Bringing Harvest for Hope BC to fruition

What are the steps to harvest?

General Timeline



What does it look like?



Seek Farms

Find farms based on...

- ✓ **Scale and Capacity:** Medium to large farms with consistent crop yields and surplus production
- ✓ **Proximity to Distribution Centers:** Farms closer to logistics hubs to reduce transportation costs
- ✓ **Crop Type:** Focus on farms producing staple foods or high-nutrition crops (e.g., fruits, vegetables, grains)

Incentives for Farmers to Partner

- ★ Farmers will receive a credit for each tonne of food they donate
- ★ Reduce waste and support sustainability

Bringing Harvest for Hope BC to fruition

Transporting Produce From Farm



In just one year...

Target 25% of all BC Farms: 5,920 farms

*42 tons of food waste per farm.

248,640 tons saved

Approximately 250,000 GHG emissions avoided

*1 tonnes of CO₂-equivalent (CO₂e) per ton of food waste.



Seek Farms

What are the steps to harvest?

General Timeline



Bringing Harvest for Hope BC to fruition

What does it look like?



Warehouse



Marketplace



Develop Centers

Key Considerations in Picking Location

- ★ Accessibility to all BC Individuals
- ★ Indigenous Communities in Rural Areas
- ★ Marginalized Communities in Urban Areas

Warehouse and Marketplace

- 📍 **Warehouse Location:** Placed in both urban and rural areas (eg. Lower Mainland, Fraser Valley, Victoria, Northern BC, Okanagan Valley)
- 📍 **Marketplace Location:** Placed in denser populated areas within the regions of warehouse

Gauging a discount structure for excess produce



How will it look like?

Discounts given based on closeness to expiration date.

20% off

Expiration Date: 7–10 days from today
Reason: Produce are still fresh, with a reasonable shelf life remaining

50% off

Expiration Date: 3–6 days from today
Reason: Produce are nearing expiration but remain consumable if purchased soon

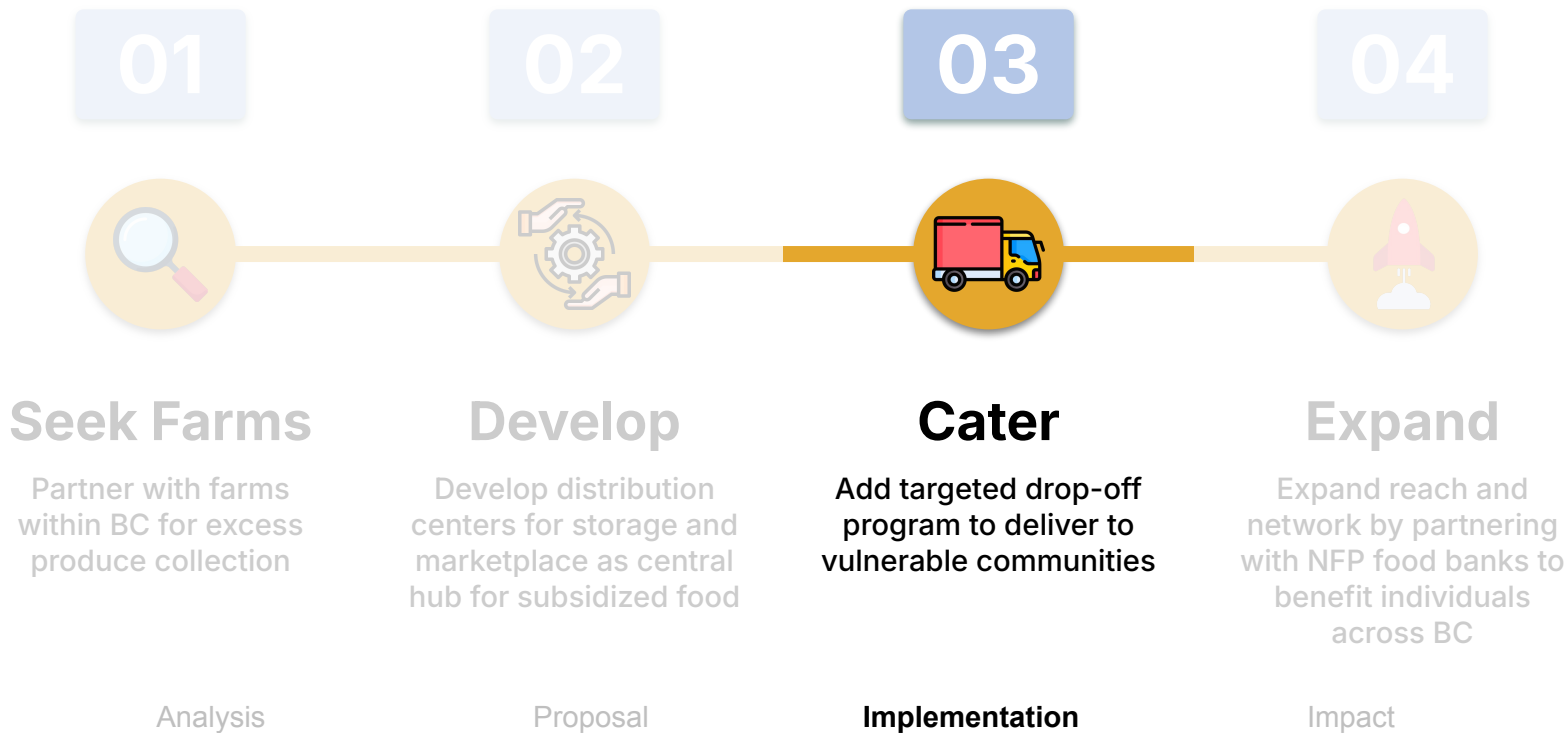
80% off

Expiration Date: 1–2 days from today
Reason: Produce are at the end of their shelf life and need to be sold immediately

Provides an affordable option of food for individuals of BC

What are the steps to harvest?

General Timeline



Bringing Harvest for Hope BC to fruition

What does it look like?



Cater to vulnerable communities



500 Rivian Vans purchased

Operation Emissions: 0 gCO₂/km

Carrying Capacity: ~1,800 kg (1.8 tonnes)

What does it look like?



Cater to vulnerable communities

500 Rivian Vans purchased

Operation Emissions: 0 gCO₂/km

Carrying Capacity: ~1,800 kg (1.8 tonnes)

To ensure program is exclusively for vulnerable communities...

Key Criteria



Low Income Level



Long-term unemployment (without external support)

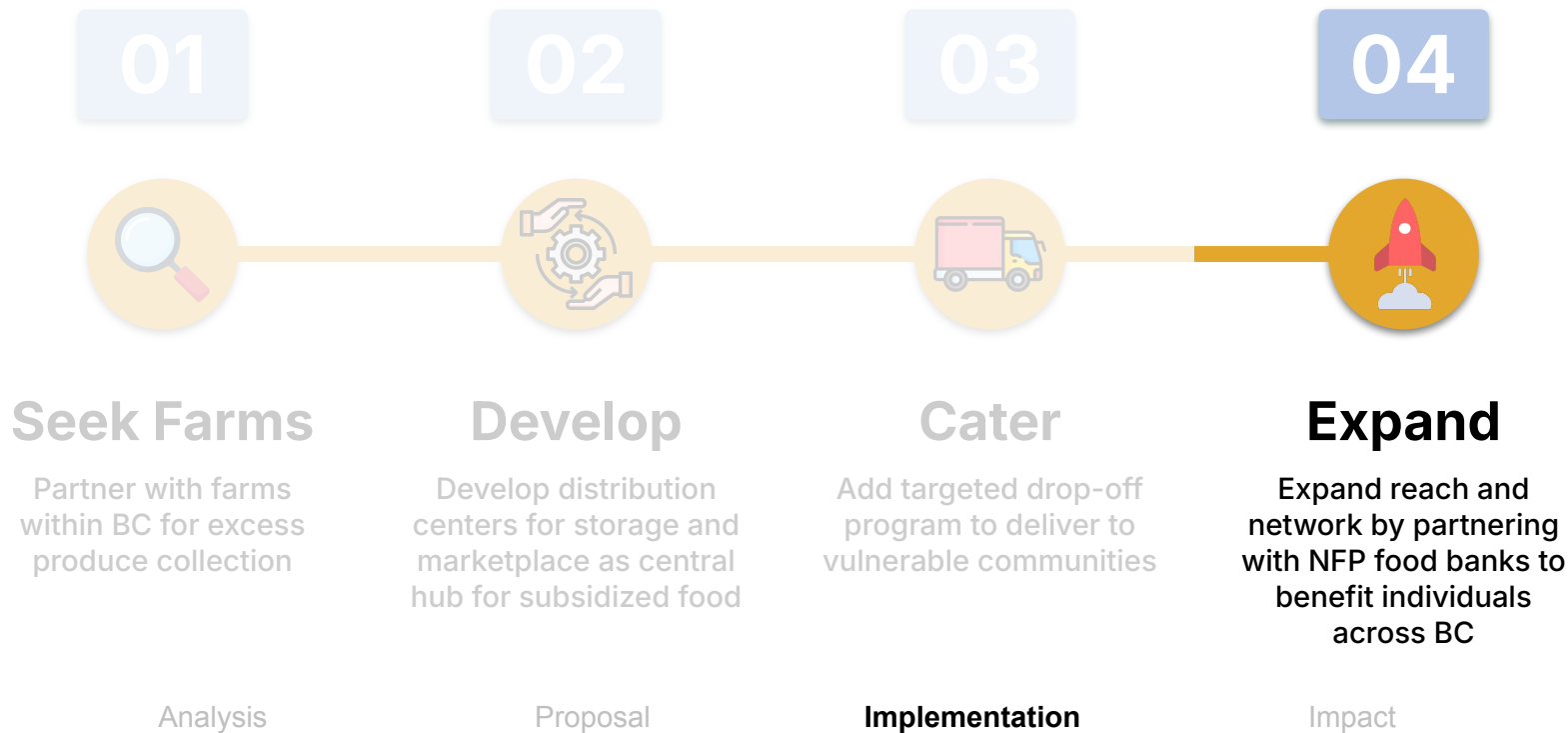


Physical, Mental, and Developmental Disabilities

Vulnerable communities fed through targeted drop off program

What are the steps to harvest?

General Timeline



Bringing Harvest for Hope BC to fruition

What does it look like?



Expand reach and impact



(Canada-Wide)



F O O D
S T A S H
F O U N D A T I O N

(Vancouver)



Utilize their networks and infrastructure to optimize food distribution



Reduce distribution costs and enhance efficiency

What does it look like?



Expand reach and impact



(Canada-Wide)



F O O D
S T A S H
F O U N D A T I O N

(Vancouver)



Utilize their networks and infrastructure to optimize food distribution



Reduce distribution costs and enhance efficiency

Incentive



Receive more food donations



Addressing food insecurity on a larger scale

Increased reach of...

SH Network: 4,400 food donors; 7,500 non-profits
FSF Network: 35 charities, 110 households, and 101 weekly members

Infrastructure: Fleet of trucks for pick-up and delivery

Bringing Harvest for Hope BC to fruition

When is it time for harvest?

Seek Farms
Partner with farms within BC for excess produce collection

Develop
Develop distribution centers for storage and marketplace as hub for subsidized food

Cater
Add targeted drop-off program to deliver to vulnerable communities

Expand
Expand reach by partnering with NFP food banks to benefit more individuals across BC

Year 1				Year 2				Year 3			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms	Seek Farms
Develop	Develop	Develop	Develop	Develop	Develop	Develop	Develop	Develop	Develop	Develop	Develop
Cater	Cater	Cater	Cater	Cater	Cater	Cater	Cater	Cater	Cater	Cater	Cater
Expand	Expand	Expand	Expand	Expand	Expand	Expand	Expand	Expand	Expand	Expand	Expand



Completion of Distribution Centers



Addition of targeted drop-off program

Bringing Harvest for Hope BC to fruition

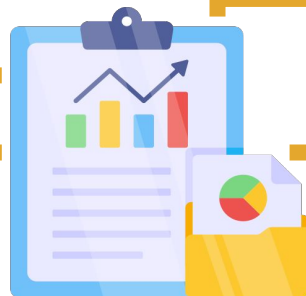
To monitor the impact of Harvest for Hope BC, we must look at...

Food Distributed

Total weight (in tons) of surplus produce collected and distributed

Waste Reduction

Waste (in tons) reduced from excess produce



Beneficiaries Reached

Number of families or individuals served, particularly in vulnerable communities

Carbon Emissions Saved

Emissions reductions from prevented food waste

In just the first year...



963,559
people served across BC
*11lbs of food per person (weekly)



250,000
GHG Emissions Saved
*targeting only 25% of BC farms

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Full Life Cycle Emissions

Amazon Rivian Vans Case Study



500 Rivian Vans purchased
0.8–1.2 kg CO₂ per km

Carrying Capacity: ~1,800 kg (1.8 tonnes)

~276 Drives Per Van

*to cover 248,640 tonnes of food waste (25% of BC farms)

Metric	Amazon Rivian EDV	Traditional Diesel Van
Tailpipe Emissions	0 gCO ₂ /km	~300–350 gCO ₂ /km
Lifecycle Emissions	~200–250 gCO ₂ /km (varies)	~1,000–1,500 gCO ₂ /km
Carrying Capacity	1.8 tonnes	~1.0–1.5 tonnes

Lifecycle Emissions:

- Emissions depend on the electricity source used for charging.
 - **Renewable Energy Charging:** Near zero emissions.
 - **Fossil Fuel Charging:** ~100–150 gCO₂/km (global average grid mix).
- A full lifecycle analysis, including manufacturing and battery production, estimates emissions at **200–250 gCO₂/km** over the vehicle's lifetime, which is significantly lower than traditional diesel or gas vans (~1,000–1,500 gCO₂/km).

Full Life Cycle Emissions

Amazon Rivian Vans Case Study



500 Rivian Vans purchased

0.8–1.2 kg CO₂ per km

Carrying Capacity: ~1,800 kg (1.8 tonnes)

~276 Drives Per Van

*to cover 248,640 tonnes of food waste

Assumptions:

Average Travel Distance of 15km (one way)

We use renewable energy charging (200gCO₂/km)

Calculations

276 Drives *30km = 8,280 Total Km

8,280Km *200CO₂/km = 1,656,000 gCO₂ Emissions Total (Year 1)

16,500Km * 200CO₂/km = 3,300,000 gCO₂ Emissions Total (Year 2)

33,152Km *200CO₂/km = 6,630,400 gCO₂ Emissions Total (Year 3)

Total Emissions: 11,586,400 gCO₂

Year 1: 250,000 CO₂ Emissions saved (25% of farms)

Year 2: 500,000 CO₂ Emissions saved (50% of farms)

Year 3: 994,560 CO₂ Emissions saved (100% of farms)

Total Emissions saved: 1,744,560 gCO₂

Carbon Negative: 9,841,840 gCO₂ deficit = 9.84 metric tons for the 3 years

Investing in Carbon Offset Projects

How we address the CO₂ Deficit?

Offset 3 years of carbon emission from EDV in 1 year with carbon offset projects!

Target: Address 9,841,840 gCO₂ deficit = 9.84 metric tons of CO₂ (that was emitted over 3 years)

Invest current capital + earnings into carbon offset projects (for 9.84 tons):

1. Reforestation/Afforestation Projects:

Total investment required per year: \$50.45 to \$504.50
Emissions saved per year: 9.84 metric tons CO₂

2. Energy Efficiency Projects:

Total investment required per year: \$101.80 to \$504.50
Emissions saved per year: 9.84 metric tons CO₂

3. Methane Capture Projects (Landfills, Agriculture):

Total investment required per year: \$50.45 to \$504.50
Emissions saved per year: 9.84 metric tons CO₂

4. Renewable Energy Projects (Solar, Wind):

Total investment required per year: \$101.80 to \$364.80
Emissions saved per year: 9.84 metric tons CO₂

5. Carbon Capture and Storage (CCS):

Total investment required per year: \$203.60 to \$1,017.60
Emissions saved per year: 9.84 metric tons CO₂

Most Optimal Projects

The **cheapest options** are **Reforestation, Methane Capture, and Energy Efficiency**, requiring **\$50.45 to \$504.50** per year to offset **9.84 metric tons of CO₂**.

These carbon offset projects allow us to be carbon neutral.

of People Served

Around 250,000 tons = 551,155,655 lbs (From 25% of farms in Year 1)

→ 11lbs per person (weekly) *52 = 963,559 people

963,559 people served across the BC in year (Higher limit)

100,000 people served in a year (Lower limit)

of BC Residents who are food insecure (2023)

23% of 4.17mm

= 959,100 residents

**963,559 people served
through program addresses
the 23% of BC residents
who are food insecure**

1. Transportation Logistics

Farm	Frequency	Pick up time	Route	Carrying Capacity
A	Twice a week	Mon, Wed, Friday	1	1.8 tonnes
B	Once a week	Tues, Thurs	3	1.8 tonnes

2. **Adjust the frequency depending on the harvesting season**
 - a. Adjust pick up times and frequencies, van load for the “equitable” distribution
3. **Cluster nearby farms to minimize traveling time and reduce the number of trips**

How would the Tax Incentives Work

BC Carbon Tax

What is it?

Introduced in 2008, B.C. was the first North American Jurisdiction to tax individuals on their carbon emissions from fuel and gas consumption

Gaseous Fuels

8.15 - 17.18 cents per litre

Liquid Fuels

8.78 - 25.50 cents per litre

Solid Fuels

\$141.80 - \$254.38 per tonne

Combustibles

\$81.76 - \$159.78 per tonne

How would a tax credit help?

Tax credits would offset any income or additional payables that are due to the government, food producers would be incentivized to deliver their unsold produce to receive the credit and pay less taxes

Taxable Income



Less: Deductions and Losses



Multiply: Appropriate Tax Rate

Net Income for Tax Purposes



Deduct: Applicable Tax Credits

Tax Payable Due

A Credit of \$130 will be awarded for every tonne of food delivered

What are subsidies and how do they work?

Agricultural Subsidies

What are they?

Agricultural subsidies are monetary transfer that exist to help alleviate costs incurred by farmers to undergo infrastructure projects or grow particular crops

Benefits

They help encourage growth in the agricultural sector as farmers are partially or fully guaranteed income for growing crops

They help increase supply of certain crops as they may have partial costs covered by the government or a guaranteed price when purchased by government

Disadvantages

Provide little incentive for farmers to ensure crops are sold if they are paid for just growing them, food does not make it to market and just sits at farms

Can cause ecological or economical issues as there could be a lack of crop rotation or an overabundance of crops that distort market priorities

Subsidies can be costly if implemented improperly and with little regard of impact

Costs of the Initiative

Costs

Total Costs to Implement Harvest for Hope BC					
Capital Costs	Y1	Y2	Y3	Y4	Y5
Hybrid Trucks	\$ 30,000,000.00	\$ -	\$ -	\$ -	\$ 30,000,000.00
Maintenance	\$ 1,500,000.00	\$ 1,575,000.00	\$ 1,653,750.00	\$ 1,736,437.50	\$ 1,823,259.38
Total Truck Cost	\$ 31,500,000.00	\$ 1,575,000.00	\$ 1,653,750.00	\$ 1,736,437.50	\$ 31,823,259.38
Cold Storage Construction	\$ 20,000,000.00	\$ -	\$ 20,000,000.00	\$ -	\$ 20,000,000.00
Cold Storage Rentals	\$ 1,858,400.00	\$ 1,951,320.00	\$ 2,048,886.00	\$ 2,151,330.30	\$ 2,258,896.82
Cold Storage Maintenance	\$ 1,000,000.00	\$ 1,050,000.00	\$ 1,102,500.00	\$ 1,157,625.00	\$ 1,215,506.25
Total Cold Storage Costs	\$ 22,858,400.00	\$ 3,001,320.00	\$ 23,151,386.00	\$ 3,308,955.30	\$ 23,474,403.07
Dry zone storage construction	\$ 5,000,000.00	\$ -	\$ 5,000,000.00	\$ -	\$ 5,000,000.00
Dry Zone Storage Rental	\$ 700,000.00	\$ 735,000.00	\$ 771,750.00	\$ 810,337.50	\$ 850,854.38
Dry Zone Storage Maintenance	\$ 250,000.00	\$ 262,500.00	\$ 275,625.00	\$ 289,406.25	\$ 303,876.56
Total Dry Zone Storage Costs	\$ 5,950,000.00	\$ 997,500.00	\$ 6,047,375.00	\$ 1,099,743.75	\$ 6,154,730.94
Total Capital Costs	\$ 60,308,400.00	\$ 5,573,820.00	\$ 30,852,511.00	\$ 6,145,136.55	\$ 61,452,393.38
Carbon Tax Credits Awarded	\$ 64,646,400.00	\$ 71,111,040.00	\$ 78,222,144.00	\$ 86,044,358.40	\$ 94,648,794.24

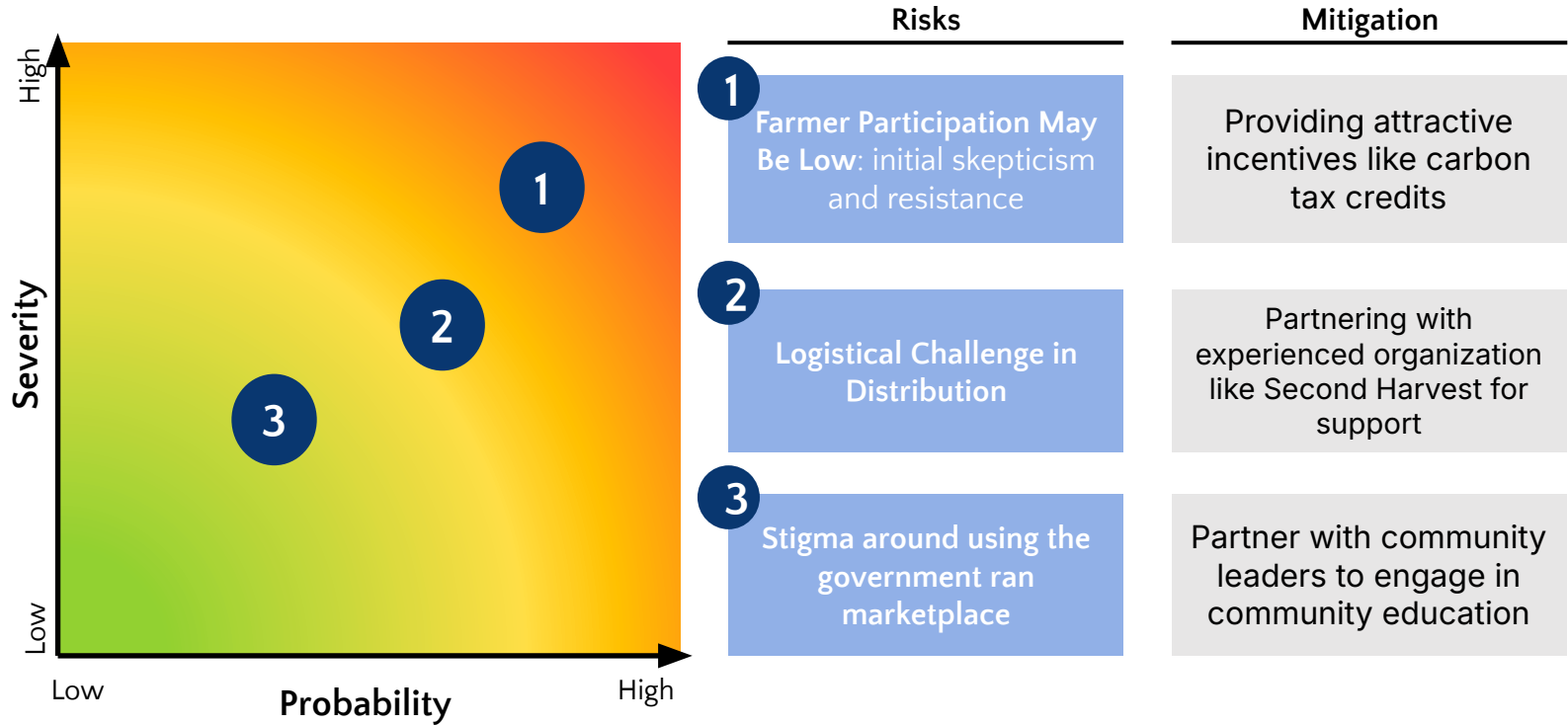
Assumptions

Growth rate of 5%

All assets incur a maintenance expense of 5% of the capital cost

Carbon Tax Credit redemption growth is 10% YoY

New trucks needed again in year 5



Rural and Urban Areas in BC with high rates of food insecurity

Both urban and rural communities experience food insecurity in BC, with rural communities experiencing higher rates of food insecurity - especially those with more marginalized communities.

Rates of Food Insecurity Across BC Communities

- The Vancouver Coastal Health region had the lowest rate of food insecurity at 10.4%. This suggests that Vancouver and surrounding urban areas may have lower rates compared to other urban centers in BC.
- Surrey, a major urban center in BC, has some neighborhoods with higher vulnerability to food insecurity. Specifically, the Newton and Guildford neighborhoods were identified as areas where low-income families, immigrants, and Indigenous peoples are most vulnerable to food insecurity.
- Within BC, the Northern Health region had the highest rate of household food insecurity at 16.6%.
- Indigenous communities in British Columbia face significantly higher rates of food insecurity compared to the general population.

Argument against Universal Basic Income

"Conditional social assistance programs in high-income countries, with stricter eligibility requirements implemented in recent decades, have not been successful in their goal of poverty reduction – based on indicators such as the escalation in food bank use and the continued prevalence of food insecurity. Income-based measures also indicate that relative poverty rates are still between 8% and 15% in most developed countries." (Rizvi et al., 2024).

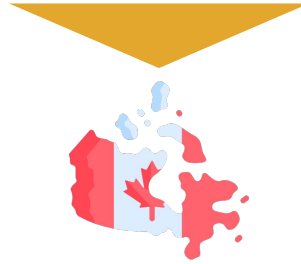
There have yet to be any instances of a conditional social assistance program being successful



Finland's UBI Program (2017-2018)

Transferred ~\$600 USD a month as a stipend. Happiness increased in the test group yet they were not anymore likely to land a job or position.

([World Economic Forum, 2020](#))



Ontario's Basic Income Project (2017-2019)

Transferred individuals \$16,989-\$24,047 CAD annually. Was cancelled due to high administration costs, lack of quality data and negative income tax.

([Province of Ontario](#))



USA Guaranteed Income Project (2020-2023)

Transferred \$50-\$1000 USD a month to individuals in 2 states for 3 years.

Resulted in decreased labour participation and no substantial increases in physical or mental health

([National Bureau of Economic Research, 2024](#))

Argument against App Based Food Redistribution

Opening the door for liability and downstream food waste redistribution

Partnering with a third party

- Partnering with a third party, could be beneficial but require lengthy agreements and contracts.
- Workarounds for scaling and data privacy would be difficult.
- Potential public scrutiny for funding a non-canadian private partner.

Starting your own platform

- Would require lengthy time to launch and additional funds to see a viable product.
- No guarantee of a successful launch after immense resources are poured into it.
- A short term solution for a long term problem in the value chain.

Shared Issues amongst both options



Liability Issues

The Government or third party partners would be liable if any recipient of the food fall ill from ingesting old food



Food Waste Redistribution

Food that is deemed inedible and still sold would not eliminate food waste but simply redistribute it to the consumer



Nutritional Consistency

Cooked foods lack nutritional consistency and variety as consumers may be eating the same or similar food quite often



Market Distortion

Offering discounted cooked food could affect local smaller restaurants that struggle to compete against discounted food

<https://foodpolicyforcanada.info.yorku.ca/goals/goal-5/food-waste/supply-chain-waste/>
<https://www.fao.org/in-action/seeking-end-to-loss-and-waste-of-food-along-production-chain/en/>
<https://uwbc.ca/stories/2024/understanding-food-insecurity/>
<https://www.bcbudget.gov.bc.ca/2024/default.htm>
https://nfsa.gov.in/portal/PDS_page
<https://www.nationalobserver.com/2021/05/07/news/why-farmers-are-throwing-food-away-and-losing-out-cash>
<https://earth.org/food-waste-on-farms/>
<https://vancouvereconomic.com/research/a-right-to-food-framework-for-a-just-circular-economy-of-food/>
<https://wfprod.secondharvest.ca/>
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http://www.bccdc.ca/Documents/2023-10-18_HouseholdFoodInsecurityReport.pdf
<https://www150.statcan.gc.ca/n1/pub/75-006-x/2023001/article/00013-eng.htm>
<https://www.sfu.ca/reach-cities/research/matrix/gender-matrix/FS1.html>
<https://www.weforum.org/stories/2020/05/finlands-basic-income-trial-found-people-were-happier-but-werent-more-likely-to-get-jobs/>
<https://go.exlibris.link/c6p3mS3Y>
<https://www.ontario.ca/page/ontario-basic-income-pilot>
https://www.nber.org/system/files/working_papers/w32719/w32719.pdf