NGEN Food Hub Feasibility and Circular Food Manufacturing Capability Model Report

February 2022

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Executive Summary

MK&A and Pollinate were commissioned by NGen[1], the City of Guelph and the County of Wellington to conduct a feasibility study on the establishment of a regional food hub.

Guelph Wellington has a well-deserved reputation for food innovation. The community is home to some of Canada's most successful food production and processing companies, including a number of emerging, highly innovative local food entrepreneurs. The momentum gains in advancing circularity principles through the Our Food Future initiative has positioned Guelph Wellington as a lead voice in this conversation.

Reflecting on this robust ecosystem, the study focused on mapping out community strengths and existing assets, and scoping out a food hub approach that built upon and enhanced the regional local food provisioning system.

Literature Review and Consultations

The first step of the feasibility study involved a vast literature review with respect to food hub initiatives in other similarly situated jurisdictions, drawing lessons from past and current initiatives within North America and around the globe. MK&A and Pollinate also conducted several rounds of stakeholder consultations to determine community perspectives on need and expectations regarding the prospects of establishing a food hub in Guelph Wellington.

The consistent themes emanating from the research and stakeholder consultations on issues of sustainability and longevity regarding a food hub project included the following:

- establish a clearly defined vision and set of objectives;
- build the initiative on strong business principles;
- avoid the tendency to overreach at the outset, allowing flexibility for the project to adapt and evolve; and
- remain community-driven at the core – establish a strong connectivity to the community and responsiveness to community need/demand.

Mapping the Local Food Ecosystem

A central component of this study involved cataloging the various contributors active in the existing food system, to develop a better understanding of the unique attributes of the region and allow for careful consideration of food hub architecture that would match against the future needs and demands of those dependent on a healthy, resilient, and sustainable food system.

A map of the Guelph Wellington local food ecosystem – and the underlying data cataloging relevant participants, resources, and programs – is an essential step to developing value-add match-making and wayfinding capacities to the regional food hub vision outlined below. It is the "smart" tool, the central glue, that underpins the unique integration and coordination features integral to strengthening the existing food provisioning system.

[1] NGen is a NFP arm of Innovation, Science and Economic Development Canada aimed at developing the capacities of Canada's advanced manufacturing sector.

"Smart" integration and coordination would also further support transformation to circularity innovations within the food system.

The Vision

While a robust local food system and attending infrastructure already exists, transformation towards "smarter ways of doing" involves establishing a more responsive bridge or critical link to local community food needs.

To accomplish this, the proposed vision involves establishing two new facilities:

- *The Guelph Wellington Local Food Leadership Network & Demonstration Centre* – a dedicated, modern space to address community needs through collaborations, way-finding, data management, activation, and education; a collision space for small/medium food entrepreneurs; and an important voice for change leadership, hosting community events, and advocating for local food system transformation.
- *The Innovation Cluster & Local Food Distribution Hub* – a new, sizable facility providing start-up and scale-up support for food entrepreneurs; space to support warehousing, cold storage, and distribution capacities; efficient purchase, storage, and distribution functions to promote aggregation and potential economies of scale; augmenting regional food security and emergency food delivery initiatives.

At its core, the proposed vision for a Guelph Wellington food hub involves the "smart", holistic integration and coordination of existing assets and resources. The City and County are well along the path towards rethinking the traditional food system, with relevant programs and resources already in place (many established through the momentum gains of the Our Food Future initiative) to serve as important foundational blocks to underpin and accelerate implementation of this vision.

A decision on preference in implementation approach (phased or otherwise) will involve internal decision-making and approval processes to weigh the fit with existing and planned municipal and county initiatives and the investment of political capital needed to secure full implementation.

Next Steps

As the City and County work through their respective internal authorization processes to sort out scope, ambition, and timing, several recommendations for proceeding and maintaining momentum towards implementation are offered below:

- Appoint an organization to maintain the Ecosystem Map and establish operating procedures within respective bureaucracies to update relevant information.
- Develop a targeted, comprehensive communications strategy and a rollout timetable that complements phased implementation.
- Establish an advisory committee consisting of individuals who are trusted community voices and would make strong project advocates.
- Designate a community leader as project champion, to put a face to the vision and ensure strong community ties as the initiative moves to implementation.

- Establish a leadership model to prioritize and coordinate implementation efforts between the City and County.

The Guelph Wellington local food community members that were engaged as part of this study were strikingly enthusiastic about the prospect of a food hub being established within the region. An array of programs and resources aimed at prioritizing local foods and circularity values already exist and serve as important building blocks to draw upon, and accelerate full implementation of the vision. A strong foundation has been established and is ready to bear the weight of an ambitious vision towards food system transformation.

Fully implemented, the regional food hub vision would better integrate existing assets and resources, maximizing efficiencies through “smart” coordination and establishing a fertile environment for continued innovations with respect to local foods and circularity principles.

Guelph Wellington is on route to establish itself as a banner jurisdiction for local food and circularity advancement, championing change leadership in the functioning of the traditional local food system through the targeted use of data and mapping. The task is made easier by the level of community energy, passion, and drive that is already present within the region.

Comprehensive Vision and Direction

A Smart Circular Local Food Provisioning System: *Where local food meets local need*

Problem/Opportunity

Guelph Wellington has a well-deserved reputation for food innovation. The community is home to some of Canada's most successful food production and processing companies, including a number of emerging, highly innovative local food entrepreneurs.

Lately the rationale for local food provisioning systems has taken on additional importance:

- Domestic food supply resiliency
- Social imperatives around affordability, accessibility, and regional economic opportunity
- Environmental imperatives around waste reduction and greenhouse gas reductions
- Cultural imperatives with increasing recognition of the importance of food to community well-being

However, the community of Guelph Wellington has seen its local food infrastructure erode. Over the past several decades, the food system has been designed implicitly around the global food system, witnessing declining explicit local markets and the attendant erosion of the supporting infrastructure (talent and business models, brick-and-mortar – e.g., canning, local supply chain logistics). A premium countervailing market built around high-end preferences has been established with little economic rationale (all things considered) for extensive scaling.

Local food community needs and opportunities:

- Farmers markets (aggregation, (cold) storage, consumer access)
- Innovation and commercialization cluster (IG, Danby, UofG, BioEnterprise), smarter and more effective business acceleration
- Emergency food system needs (transformation beyond emergency = economic opportunity + affordability + accessibility), efficient logistics (storage, transportation and distribution, aggregation and demand matching)
- Businesses
    - Firm level opportunities (smarter collaboration and way-finding)
    - Consumer access (retail, wholesale, commercial)
    - Institutional (aggregation and attribute verification)
    - Innovation (identification and exploitation of emerging opportunities e.g., carbon markets, better business oriented social enterprise)

Other initiatives to take into account:

- Baker Street, Innovation District, and Drill Hall

Missing is a critical link between the robust local food infrastructure and addressing the needs of the local community. Insert a vision for establishing a Guelph Wellington Local Food Leadership Network & Demonstration Centre and an Innovation Cluster & Local Food Distribution Hub – together, and working in tandem, these facilities would provide the necessary linkage. Together the two facilities would form the intersection between responsiveness to community need and emergence of an effective, efficient local food system.

Enter the Guelph Wellington Food Hub....

Vision and Rationale

A Guelph Wellington food hub would provide the infrastructure and smart connectivity between an already vibrant local food system and diverse community needs, addressing infrastructure gaps and offering dedicated local food entrepreneur support.

Three core physical components:

1. Innovation cluster & local food distribution hub
2. Local food leadership network & demonstration centre (downtown farmers market 2.0 + Our Food Future)
    a. Community nodes (e.g., Grand River, Fergus Business Park)
3. Community users (e.g., farmers markets, neighbourhood markets, food bank)

These core physical assets would be coordinated, integrated, and energized by a virtual food hub - an intelligent, data-driven connector, taking advantage of smarter utilization of existing infrastructure resources and assets (e.g., funding sources, business support programs, warehouse and cold storage space, commercial kitchen space, distribution infrastructure, etc.) to address local producer, food entrepreneur, or consumer demand/need.

The virtual connector would establish a one-stop window to coordinate the operations of the two new initiatives – the Innovation Cluster & Local Food Distribution Hub and the Local Food Leadership Network & Demonstration Centre – as well as ensure integration with existing and emerging Guelph Wellington programs and services supporting local food businesses and circularity uptake.

A significant foundation of relevant and associated programs and services are already underway or planned, making a food hub initiative a positive and beneficial endeavor in its own right, in support of strengthening the infrastructure and logistical elements underlying the regional local food provisioning system.

The two new facilities would further add to the capacities of the Guelph Wellington local food ecosystem in the following manner:

- The **Guelph Wellington Innovation Cluster & Local Food Distribution Hub** connects the local food system to reduce waste and resolve processing, storage, and distribution challenges while also leveraging the proximity benefits of an emerging innovation agri-food tech cluster. The Hub will be an aggregation and logistics terminal for incoming food and food products and intelligent distribution to community, institutional, and commercial users, thereby providing access to local foods for the whole community. It will also support local food entrepreneurs and agri-food innovation, offering a collision space for sharing ideas and experiences, and promoting business partnerships and collaborations.
- The **Guelph Wellington Local Food Leadership Network & Demonstration Centre** is envisioned as a physical presence in the community it serves, providing an animated, modern space for addressing local food community needs through collaborations, way-finding, data management and activation, and education. Importantly, the Centre will be a space to integrate Our Food Future into the conceptualization and re-construction of the local food provisioning system.

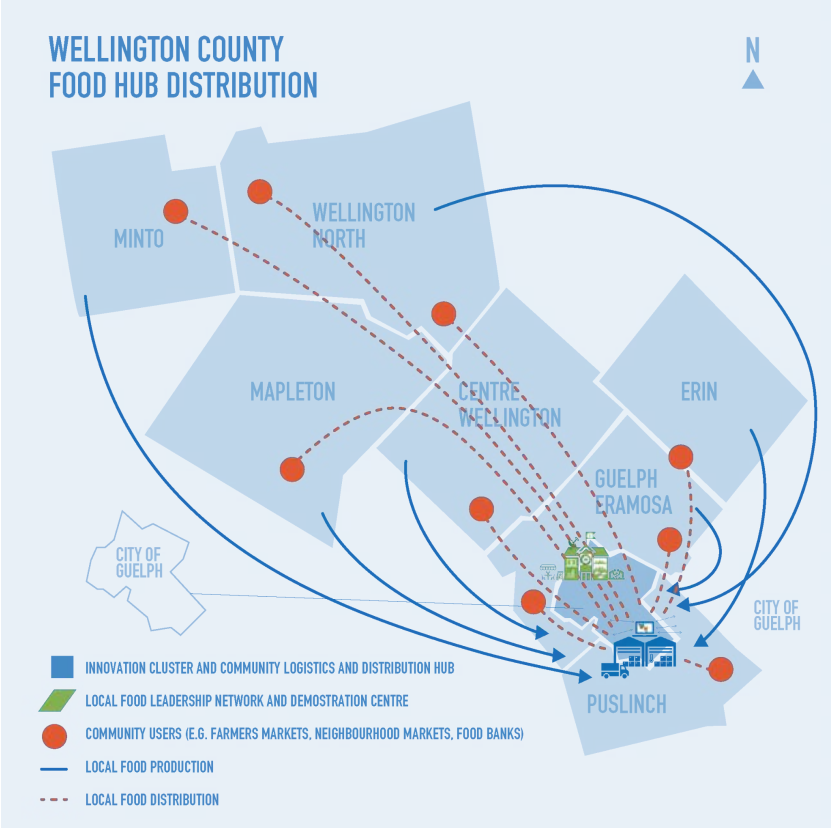
Components	Activities	Priorities	Existing Assets	Emerging/proposed assets
Innovation & Distribution Hub	• Local food cluster focused on innovation, efficient logistics, aggregation, and distribution	• Emergency food system needs (warehousing + cold storage; distribution)	• Food bank • The SEED • Hope House	• Innovation and local food Hub cluster • Innovation centre (JE) • Logistics and distribution facility
Leadership Network & Demonstration Centre Community Nodes	• Data management and activation • Leadership collaboration	• Identification of opportunities and coordination of execution • Processing capacity including on-farm processing advancement (e.g.,	• Farmers Markets, 10C, iHub, IG • Grand River Agricultural Society • Fergus Business Park	• Identification of emerging opportunities and way-finding forward • Processing facility (MPO - Meat processing centre of excellence; North

		red tape reform)[2]		Perth, Dufferin Meat Processing project) • On-farm processing (regulatory and other supporting policy changes) • Baker Street development • Guelph Innovation District
Community Users	• Existing and future users of enhanced local food provisioning ecosystem	• Enhanced engagement with existing users • Identification and advancement of immediate term needs and opportunities	• Neighbourhood groups • Farmers Markets • iHub, resource exchange, COIL	• Emergency food users • Local food commercial users • Employ of food hub study data assets, mapping and matching to support pilot projects (e.g., circular meal) • Talent identification and development

The regional map below offers a schematic of how the two envisioned local food initiatives would interact and integrate regional market demand through smart coordination along the entire supply chain within the local food provisioning ecosystem, from production to warehousing and storage, to product innovation, distribution, and eventual consumption by end users.

[2] Regulatory reform for advancing on-farm processing will be critical. The reform needs are more about the culture and navigation of the regulatory system rather than the rules/regulations themselves. A list of areas for reform would include:

- Too many permits - or permits that take a long time but are not coordinated (and could be - there are not always dependencies)
- Too long in between contacts with municipal support folks
- Instructions not clear for the process an entrepreneur has to take, to meet requirements
- Basic information not shared or accessible - i.e. which cleaners *are* ok for organic use?
- Delays on items that are not meaningful - i.e. debate about number of rudbeckia planned for the property
- No way to know if you have actually met the requirements in some cases - both before *and after* the process; have to wait to see what the inspector says
- Areas where no one knows who to go to for clarity (i.e., explaining the milk act to the city - having to learn it and refer them to appropriate sections; being sent to “ask the ministry” but not entirely clear on which ministry or who to meet with)
- Average seems to be 8 months/80K to get through regulatory process
    - Can be much more by location -
        - closer to larger urban areas is more problematic
        - people who go first are also subject to process issues as regulators are only just creating the process
- Consultants seem to be a necessity even for the most dogged entrepreneur. To some it feels like a “racket” to have entrepreneurs pay to have regulation processes explained to them by a 3rd party.



Organizations already in place to support and participate in the local food hub include:

Together, the Innovation Cluster & Food Distribution Hub and the Leadership Network & Demonstration Centre would increase the visibility of, and access to local food goods, champion circularity principles, and manifestly promote Guelph Wellington as a leader rethinking the conventional food system. The introduction and integration of these physical spaces would contribute the following:

- Connect the community, regardless of income or circumstance, with locally sourced, sustainable food.
- Link local food providers to reduce cost and waste, encourage leadership, and facilitate new and emerging local food entrepreneurs.
- Provide data, logistics, and distribution support to local farmers and food providers.
- Encourage local food consumption, sustainable food production, and waste reduction.
- Provide the Guelph Wellington community with opportunities for employment, encourage further investment in sustainable food production and processing, and meet present and future community needs for reliable, quality nutrition.

Key Success Elements & Competencies

The end goal of successful establishment of the Guelph Wellington food hub vision is to strengthen the local food provisioning ecosystem by enhancing the following competencies:

- Smart ecosystem data capture – updated database and mapping of local resources, assets, and key participants in the local food provisioning system.
- Strong community outreach and promotion of collaborations and partnerships.
- Enhanced efficiencies in the logistics – i.e., purchasing, storing, packaging, and distributing local foods.
- Acute understanding of local market and local food access bottlenecks, ensuring that the “pull” of market demand drives Food Hub direction.
- Strong farm-level support and producer participation, strengthening local consumer access to local foods.
- Increased talent capacity in leadership, community relationship-building, and knowledge base.
- Develop into a strong, established and trusted voice for local foods and the adoption of circularity principles through advocacy, outreach, and effective change leadership.

The table below offers a more granular depiction of what activities, resources, and potential partners might support the various competencies of a Guelph Wellington food hub initiative.

	Ecosystem data capture and activation	Market access/ demand focus	Efficient logistics	Outreach, collaboration and partnerships	Outreach, education and change leadership	Talent capacity	Firm level support and services
Activities	Mapping	Demand aggregation	Transportation	Community engagement	Public policy research	Upskilling	Way-finding Leverage ag-tech cluster
	Data activation	Data activation	Data activation	Data activation	Data activation	Data activation	Data activation
	Matching	Curated collaboration	Distribution	Curated collaboration	leadership convening	Outreach	Curated collaboration
		Business innovation	Storage		Communications	Training and education	
		Supply chain problem solving	Logistics			Leadership development	
Costs, Resources, & Responsibilities	Dedicated FTE's	Dedicated FTE's	Dedicated FTE's	Dedicated FTE's	Dedicated FTE's	Dedicated FTE's (possibly existing)	Dedicated FTE's (possibly existing)
	Business process integration IT system	Physical infrastructure	Physical infrastructure and assets	Leverage new physical infrastructure	Leverage new physical infrastructure	Leverage existing and emerging capacities	Leverage existing and emerging capacities

	Ec Dev Program Staff (Taste Real), Incubator staff (IHub, COIL)	Food hub players and staff with partners and stakeholders	Food hub players and staff with partners and stakeholders	Combined Ec dev program staff manage "shared calendar"	Food hub leadership team with partners and stakeholders	Food hub coordination of population intelligence, prioritization, and events	Food hub wayfinder connects with other wayfinders
Partners and Stakeholders	Vector Institute	Community users: SEED, CHC, Hope house, Food bank	Sponsors	Community of interest partners (10C, SEED, Market)	Educational partners (UofG, Colleges) NGen	Educational partners (UofG, Colleges) NGen + private sector partners	Innovation partners (IG, BioE, OMAFRA, FedDev, Guelph Chamber, Emerging innovation cluster
	NGen	Institutional users	NGen		Ontario and Canada	Ontario and Canada	
		Commercial users	UofG				

Implementation Approach

The research and stakeholder consultations undertaken as part of this study point to several common observations regarding implementation, based on past (and often failed) efforts in other jurisdictions to launch regional food hub projects. Several implementation cautions are consistently cited with respect to enduring sustainability of a food hub:

- be realistic and do not overreach at the initial phase — remain as flexible and nimble as possible at the outset to be able to adapt quickly to the unknowns and unforeseen; and
- draw on a strong connectivity with the community, especially through an acute understanding of community need/demand and strong community relations – the "pull" and ongoing support for the project should be based on community-driven demand.

Project implementation can be pursued cautiously through phases, or more ambitiously by aspiring to the end-goal at the outset. Each approach carries its own advantages and inherent risks, and pursuit of any one approach depends on the weighing of available resources, level of risk acceptance, community engagement, and political capital. The discussion below outlines several potential paths towards the realization of the Guelph Wellington local food hub vision, followed by an analysis of the costs, benefits, and risks associated with each.

The potential implementation approaches scale from modest and cautious, to ambitious, and can be viewed as a possible chronological map for realizing the full vision of the Guelph Wellington local food hub as described above.

Three separate initiatives are proposed below. If adopted separately as sequential phases, they would form a guide to eventually establishing all the components envisioned as part of

a multi-faceted Guelph Wellington local food hub. However, resource, timing, and political considerations could also favour pursuing two or all three entities at once.

There is no magic to these considerations. In general, starting small translates into more modest funding needs and far shorter timelines as location search, approvals, and construction phases are avoided. On the other hand, an ambitious implementation initiative involving the construction or renovation of one or more new facilities incurs a more challenging funding hurdle at the outset and must anticipate lengthy lead times to accommodate the necessary approvals and construction. This is discussed in further detail below.

The core activities envisioned for each of the three proposed initiatives are as follows:

1. **VIRTUAL FOOD NETWORK OFFICE** — establish concierge/connector service through an enhanced community network and mapping database. A virtual "concierge" service would provide intelligent, data-driven coordination, taking advantage of smarter utilization of existing infrastructure resources and assets (e.g., funding sources, business support programs, warehouse and cold storage space, commercial kitchen space, distribution infrastructure, etc.) to address local producer, food entrepreneur or consumer demand/need.

2. **LOCAL FOOD LEADERSHIP NETWORK & DEMONSTRATION CENTRE** — establish a dedicated, modern central location to address community local food needs through collaborations, way-finding, data management and activation, and education. The Centre could become an animated space with the addition of retail (e.g., Farmers' Market 2.0) and conference capacities. Importantly, the Centre would integrate Guelph's Our Food Future programming through the re-construction of the local food provisioning system.

3. **INNOVATION CLUSTER & LOCAL FOOD DISTRIBUTION HUB** — new, advanced facility offering dedicated food entrepreneur support as an agri-food innovation cluster, along with smart coordination and economies of scale in the purchasing, storage, warehousing, and packaging of local foods as an aggregation and logistics terminal.

The table below offers a quick overview of the various elements associated with each of the three initiatives.

	Virtual Food Network Office (Phase 1)	Leadership Network & Demonstration Centre (Phase 2)	Innovation Cluster & Local Food Distribution Hub (Phase 3)
Characterization	• Smart utilization of existing infrastructure resources and assets	• Physical manifestation of rethinking the food system in Guelph Wellington	• Aggregation and logistics food terminal, along with an agri-food innovation cluster component
Focus	• Ecosystem data capture and activation • Outreach, collaboration, and partnerships • Coordination and repurposing of existing resources • Outreach, education, and change leadership	• Permanent home office for Virtual Connector activities • Market access/demand focus • Efficient logistics • Advocacy – e.g., business friendly regulation • Talent capacity	• Market access/demand focus • Efficient logistics and added infrastructure capacities – storage, distribution, etc. • Outreach, collaboration, and partnerships • Collision space for agrifood innovation
Potential Priorities	• Mapping and matching for pilot projects (e.g., circular meal) • Talent identification and development • Build out business case for next steps – i.e., physical presence	• Efficient logistics opportunities – aggregating demand to achieve economies of scale • Retail – Farmers' Market 2.0 – and conference facilities	• Dedicated agri-food innovation support • Central food terminal facility • Coordinated support for local social assistance network – e.g., Emergency Food System focus

Cost[3]/Benefit Analysis of Phased Implementation

Phase 1: Virtual Food Network Office

Particulars:

- Essential elements: leadership, community relationship, talent capacity.
- Core focus involves establishing and maintaining a local food ecosystem database of assets.
- Activities include reinforcing community stakeholder networks through ongoing outreach and targeted promotion of collaborations and partnerships.

[3] The cost projections provided are more representational and should be considered as very rough guesstimates based on similarly situated initiatives underway or carried out in the not-to-distant past by other jurisdictions. More accurate cost projections would entail a targeted study based on specific decisions concerning purpose, location, new build or renovation, square footage required, etc.

- Local food connector — providing concierge services focusing on integration and efficient use of existing assets (i.e., programming, repurposing of under-utilized infrastructure, assisting aggregations to achieve economies of scale, etc.).
- Dedicated local food/circularity voice within the community, assuming education/advocacy roles with respect to local food benefits and application of circularity principles and values.

Expansion Potential: After some time in operation and demonstrating value-add to community stakeholders, the office will have established a firm foundation for evolving to a brick-and-mortar footprint (i.e., either Phase 2 or Phase 3, or both).

Economic Rationale: Food entrepreneurs and business organizations have cited a need for storage space and have pointed to the benefits of better, centralized coordination to target under-utilized assets and resources within the local food provisioning ecosystem. A connector office with strong community ties (stakeholders, organizations, institutions, government), drawing upon an up-to-date database and mapping of local assets, would allow for "smart", one-stop concierge services to enhance the strength and resilience of the local food provisioning system.

Implementation Cost: Estimated $600 - 800k for central office space and equipment, plus appropriate staffing (highly motivated, community-entrenched leadership, and knowledgeable staff).[4]

Implementation Timing: Estimated 5-6 months from announcement to becoming fully operational.

Direction Risks: If the Virtual Food Network Office is unable to provide consistent, timely, and knowledgeable support to local food entrepreneurs, it is at risk of quickly becoming irrelevant as individuals and businesses seek to troubleshoot and problem-solve on their own. Further, a lack of physical presence through a dedicated brick-and-mortar facility may make it difficult to generate community excitement and participation in the initiative, which in turn may make it more difficult to garner attention and attract the necessary future investments to support expansion and new builds.

Direction Benefit: The initial investment is low, since the initiative is not attached to a new build. This dynamic means that from the outset, the initiative is nimble and adaptable, with the lead-up time to implement being comparatively short. Most of the variables that might impact cost, timing, and staffing would remain in the City or County's control. This would be a low risk, timely first step to realizing the full Guelph Wellington food hub vision.

[4] The assumption is that appropriate office space would be found within the City's existing network, and that most of the budget would be devoted to staffing (ideally Director + 4 staff members) to provide envisioned "smart" concierge and connectivity services.

Phase 2: Local Food Leadership Network & Demonstration Centre

Particulars:

- Provide a permanent physical location for Phase 1: Virtual Food Network Office - offering "smart" concierge services that are data and mapping based, focusing on integration and efficient use of existing assets and resources.
- Respond to community local food needs through collaborations, way-finding, data management and activation, and education.
- Introduce a modern facility to provide a collision space for small/medium food business entrepreneurs, with start-up and scale-up guidance and mentorship.
- Become an important community voice for change leadership, integrating Guelph's Our Food Future programming and advocating for the re-construction of the local food provisioning system – i.e., promoting local food or circularity friendly regulations.
- Host community events (community dinners, circular meal, local food/circularity conferences) to reinforce the local food system transformation narrative.

Expansion Potential: Retail outlet (e.g., Farmers' Market 2.0), conference facilities, agricultural learning garden to showcase circularity innovations. Further, this initiative would lay the logistical foundation and rationale for Phase 3 Agri-Food Innovation Cluster & Local Food Distribution Hub – the two initiatives would work hand-in-hand.

Economic Rationale: There is a consistent expression of need for centralized coordination of existing warehousing, storage, packaging, and distribution capacity to maximize utilization of existing local food infrastructure, promoting aggregation, collaborations, and partnerships to realize economies of scale. A permanent, high profile location for a connector office with strong community ties (stakeholders, organizations, institutions, government), drawing upon an up-to-date database and mapping of local assets, would allow for "smart", one-stop concierge services to enhance the strength and resilience of the local food provisioning system.

Further, local food entrepreneurs would welcome a dedicated space for information, knowledge, and experience sharing, to expedite problem-solving, receive guidance and mentorship, and promote partnerships and collaborations.

Implementation Cost: Estimated at about $6 - 10 million to construct a new facility (assuming a new building located in central Guelph, calculated at about $500/sq. ft.).[5]

Implementation Timing: Estimate 2-3 years to approve location, complete construction of new build (or renovation of existing space), and become fully operational.

[5] Toronto's **Evergreen Brickworks** renovated an historic 53,000 square foot building using green design and construction innovations to create a large-scale community environmental centre – elements which inflated the cost. Construction began in 2008 at a budget of $55 million (including $20 million from the federal Canadian Strategic Infrastructure Fund and $10 million in provincial contributions). The Evergreen Brick Works opened in September 2010.

Direction Risk: The initiative is tied to the creation of a physical space, and so will be under pressure to ensure sustained, efficient utilization. Strong community support and participation will be vital to ensuring the ongoing success of the Centre. The full strength of this initiative hinges on the completion of the Phase 3 Agri-Food Innovation Cluster & Local Food Distribution Hub – the operational arm of the full Guelph Wellington food hub vision as outlined above.

Direction Benefit: This initiative would establish Guelph as the flagship for change leadership in the transformation of the local food provisioning system through data and mapping. As a banner facility for local food and circularity advancement, the Centre would attract innovative entrepreneurs and thought leaders from across the country and around the world. The addition of retail and conference capacities would help to animate the space.

Phase 3: Agri-Food Innovation Cluster & Local Food Distribution Hub

Particulars:

- Start-up and scale-up support for small/medium food entrepreneurs, offering both physical space – e.g., commercial kitchen space, packaging – and professional guidance through knowledge/expertise sharing.
- Warehousing, cold storage, packaging, and distribution capacities to supplement food provisioning logistics and infrastructure.
- Efficient management of purchase, storage, and distribution functions within the ecosystem, allowing for aggregation and potential economies of scale for small, local food producers and entrepreneurs.
- Working in tandem with the "smart" coordination provided by the Leadership Centre, augment regional food security initiatives – e.g., supporting local initiatives like The SEED's Emergence Food Services in providing emergency food access and delivery to community pockets experiencing food insecurity.

Expansion Potential: Local food innovation funding support (akin to seed monies offered through London's The Grove[6]); expanded commercial services and possible space/equipment renovations to support changing product innovation and business scale-up needs.

Food processing capacities (e.g., meat, grain dryer, egg grader, etc.), while an area of possible expansion, would be challenging additions given inherent regulatory hurdles, the significantly heightened investment requirements, and space accommodation within a finite facility footprint.

[6] London's Western Fair District launched **The Grove** in 2019, a 60,000 sq. ft. agri-food hub to support food entrepreneur start-ups and scale-ups. In 2021, FedDev Ontario invested $7.2 million in The Grove for renovations, new equipment, seed money, and education programs. The expansion is expected to create 550 jobs, maintain 100 more, and help to commercialize 20 new products, supporting the development and growth of up to 40 SMEs.

Economic Rationale: There is vocal stakeholder/producer demand for enhanced food infrastructure capacity. A focus on warehousing, storage, packaging, and distribution capacity, where aggregation can result in economies of scale, would be well received by consulted stakeholders, and would incur more modest investment costs.

Further, local food entrepreneurs and small businesses would welcome a dedicated space to support local food product development and innovation, business scale-up, mentorship, and guidance.

While there are strong advocates for increasing food processing capacities within the region, it is unproven whether there is the consistent demand and volume regionally to sustain the large capital investments involved (i.e., meat processing, grain dryer, egg inspection).[7]

The local food distribution hub component of this initiative is vital to operationalizing the "smart" data and network-driven coordination functions of Phase 2 Local Food Leadership Network & Demonstration Centre. The economies of scale realized by establishing a central warehousing, storage, and distribution facility would benefit existing community food security initiatives (e.g., the SEED, the Food Bank, etc.).

Implementation Cost: Estimated at $3 - 4 million (assuming a new building located outside of Guelph, calculated at about $200/sq. ft.) for sizeable brick-and-mortar footprint, including capacity for managing food freight logistics, commercial kitchen and product development, warehousing and storage, packaging, and distribution.

Implementation Timing: Estimated 3-4 years to secure location and necessary approvals, complete construction, and become fully operational.

Direction Risk: The project is tied to a new build requiring a significant footprint, and so will be under pressure to ensure sustained efficient utilization of the space. This will be challenged by shifting demands precipitated by a variety of uncontrollable factors.[8]

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[7] The United Counties of Prescott and Russell (UCPR) innovative food hub project in Eastern Ontario includes a planned federal slaughter facility, as well as additional food processing and distribution capacities. The cost (2020 estimate) is $36 million, creating an anticipated 65 jobs. The project is still in negotiations to find a suitable location.
Alternatively, the **Ontario Agri-Food Venture** (OAFVC) Northumberland County project launched in 2012 (open in 2015) is a 15,000 sq. ft. food processing facility costing $2.5 million. The not-for-profit specializes in small-batch food processing, packaging, and storage. In 2021, the OAFVC reported serving 120 local food entrepreneurs, launching 20 new businesses, and helping clients manufacture more than $1.5 million worth of product annually.

[8] At the beginning of last year, because of the pandemic, the OAFVC experienced a period of low utilization and was at severe risk of closing operations. By Q3, however, fortunes reversed to the extent that the Centre may not require the same level of annual public investment over the near term. Originally the project was expected to derive most of its income from farm community participants; instead, operations have since been driven by market demand and food entrepreneurs (product innovation, business scale-up, storage).

Direction Benefit: The local food distribution hub would support regional access to local foods, benefiting local consumers, institutions and retail outlets; the economies of scale would particularly benefit existing operations addressing regional food insecurity. The agri-food innovation cluster would support local food entrepreneurs and assist in product development. Combined and given the uniqueness of the vision, these components would likely attract the necessary private and public sector investment partners.

The full strength of this initiative hinges on execution of the Phase 2 Local Food Leadership Network & Demonstration Centre – the logistical "brains" to the operational arm of the full Guelph Wellington food hub vision as outlined above.

Conclusion

In summary, phased implementation would minimize the risks and pressures for demonstrating value-add and eventual funding self-sufficiency, since the initial investment costs would be reduced and at the outset not tied to a new build. There is added flexibility in starting with the proposed Phase 1 Virtual Food Network Office, since it can be more readily adapted to accommodate unforeseen ecosystem developments.

Further, establishing a virtual office could be accomplished in a relatively short time, especially considering that virtual resources already exist within the City that would support its operation. For instance, the FoodMesh[9] and the ReSource Exchange Marketplace[10] are examples of existing building blocks that promote food business collaborations within the region. The integration of the data and mapping elements of the proposed Virtual Food Network Office would bolster the impact of these existing resources.

A potential concern is that the modest start envisioned by Phase 1 might dilute the bigger picture and slow momentum towards realizing the full Guelph Wellington food hub vision.

To capture the imagination, motivate strong community participation, and attract the significant public and private sector investment required, buy-in to (and therefore advocacy of) the fulsome Guelph Wellington food hub vision may be preferable. As such, the calculation may be to abandon caution, skip Phase 1 and proceed with either Phase 2 or 3, or both, as the prefered starting point regardless of the significant financial outlay, lengthy delay in landing a fully operational facility (or facilities), and inherent risks in ensuring sustainability.

Below is a summary table of the projected costs and timing associated with each of the initiatives proposed.

[9] A digital network connecting surplus food to those in need within the community – first to charitable organizations to turn into meals, then to farmers for animal feed, and then to composters – reducing food waste and promoting circularity.

[10] A virtual business-to-business platform connecting food waste, by-products and co-products to new uses and opportunities, building collaboration to maximize the commercial and environmental value of food goods.

	LOCATION	ESTIMATED COST	ESTIMATED TIMING
PHASE 1 Virtual Food Network Office	➢ Existing office space ➢ Located centrally within the City	➢ $600k - $800k	➢ 5-6 months ➢ Lead variable: staffing
PHASE 2 Local Food Leadership Network & Demonstration Centre	➢ Construction of new or newly renovated facility (12k - 20k sq. ft.) ➢ Located centrally within the City	➢ $6 - 10 million ➢ Calculated at about $500/sq.ft.	➢ 2 - 3 years ➢ Lead variables: funding, approvals, construction
PHASE 3 Agri-Food Innovation Cluster & Local Food Distribution Hub	➢ Construction of new, expansive facility (15k - 20k sq. ft.) ➢ Located in close proximity but outside of the City	➢ $3 - 4 million ➢ Calculated at about $200/sq.ft.	➢ 3 - 4 years ➢ Lead variables: funding, approvals, construction

A decision on preference in approach will need to weigh the fit with existing and other municipal and county initiatives underway, the level of anticipated community engagement and participation, and the investment of political capital needed to secure full implementation.

At its core, this vision for a Guelph Wellington food hub involves an integration of existing assets and resources through two new facilities. The City and County are well along on this path, with related initiatives such as 10C, the Provision Coalition, Innovation Guelph, Taste Real[11], the FoodMesh, and the ReSource Exchange Market as examples of already entrenched programs.[12] In addition, a regional network of university and college initiatives to support food innovation and food entrepreneurs further strengthens the existing ecosystem. The foundational blocks are already in place to underpin and accelerate implementation of the proposed regional food hub vision.

[11] Taste Real has launched successful initiatives such as The Local Food Map, Local Food Fest, Rural Romp, Source It Here, and Taste Real Experiences.

[12] A more fulsome account of the various existing assets supporting the proposed regional food hub vision can be found as part of the Food Hub Ecosystem Mapping exercise included in this study.

The call for greater integration of this vast array of regional support resources was a common theme in the consultations with local stakeholders and program staff alike. A fully operational Local Food Leadership Network & Demonstration Centre, working in tandem with an Agri-Food Innovation Cluster & Local Food Distribution Hub, would inject the necessary integration of these various existing elements and provide greater cohesion in the promotion and delivery of the regional food provisioning system.

A 'Field of Dreams' approach may not necessarily align with narrow economic calculations, but may register greater merit when taking into consideration the foundational resources already available, the level of strong community sentiment favouring this direction, and the runway already established by previous policy initiatives (eg., Our Food Future).

Next Steps

It is recognized that the City and the County have a number of projects on the go that potentially intersect with the proposed food hub vision described above. As the two government entities work through their respective internal decision-making processes to sort out scope of ambition and timing with respect to implementation, below are several considerations that we advise should be addressed concurrently:

1. **Resource maintenance**

   The data that underlies the local ecosystem map developed as part of this project has a limited shelf-life and requires constant maintenance and updating to remain effective. The map is an integral tool to the integrated food hub vision, the "smart" component of ensuring the efficient and effective deployment of resources. Without consistent maintenance and updating, the ecosystem map risks becoming stale and losing relevance.

   Recommendation: appoint an organization to maintain the ecosystem map (at least until either Phase 1 or Phase 2 have been realized), with new operating procedures introduced within appropriate sections of the City and County bureaucracy to consistently feed/update relevant information.

2. **Socialization of the vision**

   The proposed vision is ambitious, and relies on strong support from local stakeholders and community leaders. As noted above, the community voices consulted as part of this project were strongly in favour of a local food oriented initiative. Momentum for this initiative already exists and can be built upon, enhancing the political capital necessary to realize implementation.

   Recommendation:

   - develop a targeted, comprehensive communications strategy that clearly details the various components of the vision, and a rollout timetable that complements phased implementation; and

- coordinate community socialization and intergovernmental (provincial/federal) briefing efforts between the City and County.

3. Advisory Committee

Research suggests that food hub initiatives are more likely to be successful when community-driven. This can be accomplished by encouraging a high level of community engagement and stakeholder participation from the outset. Involvement of a cross-section of community voices in the planning and decision-making processes will help to deepen community ties and build momentum towards implementation of the initiative.

Recommendation: establish an advisory committee representative of the likely users and beneficiaries of the projects, especially individuals with strong community ties who are trusted voices and would make strong project advocates.

4. Leadership

As discussed above, community engagement will be vital to the success of this initiative. A project that is community-driven should not only have community voices at the table, but strong community leadership at the helm.

Recommendations: designate a community leader as project champion, to put a face to the vision and ensure strong community ties as the initiative moves to implementation, and beyond that, strong community engagement and participation once the project is operational.

Introduction

Initial consultations to explore the development of a circular food hub for Guelph Wellington led to the discovery that there were 3 visions for what a food hub could be. These visions are explained in detail in the Consultation 1 Findings report and a visual representation of them has been adopted.

Circularity is an important Guelph Wellington brand element and each of the visions would be to enhance and engage further with circular practices.

After the first round of consultations, the focus of the food hub was narrowed to identify the feasibility of a Local Food Hub defined as follows.

Focus:
Championing and promoting the production and consumption of local foods.

Beneficiaries:
Local producers, consumers interested in purchasing local foods.

Local Food Hub - Ecosystem Infrastructure

Vision

A central location within or close to Guelph with connected warehouse facilities — spokes — across the County to better connect local producers with the urban market, especially consumers interested in buying local.

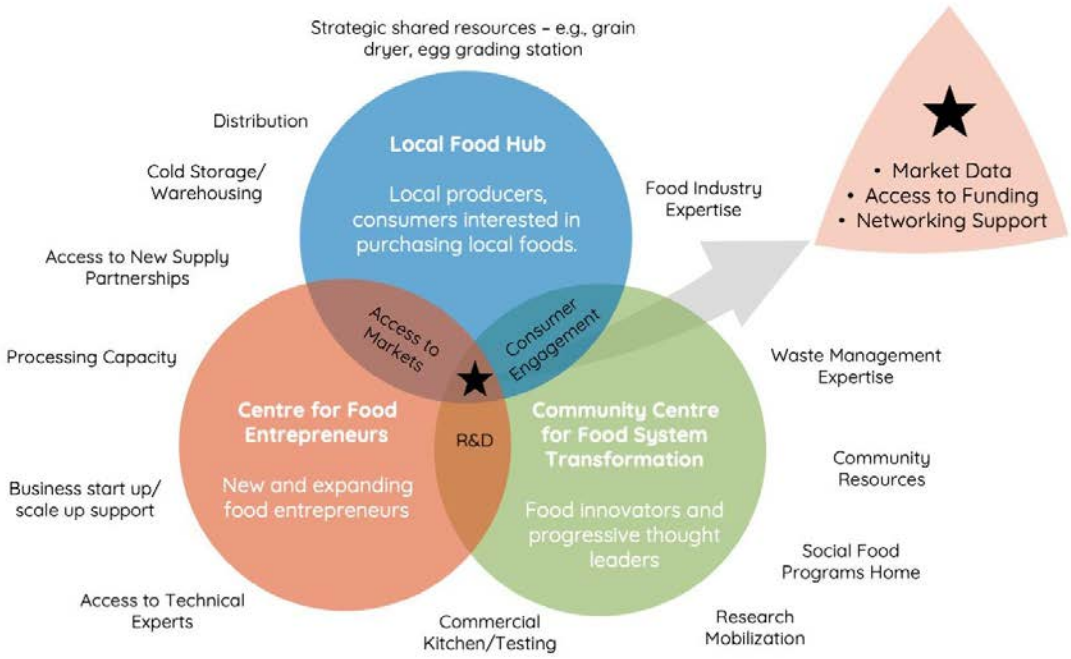
Venue Type

- Commercial-oriented, expansive brick & mortars facility.
- Several food warehouse/storage sites in County to accommodate delivery to urban-based food hub and urban customers (especially in support of on-line farm sales).

Activities

- Aggregation: bulk buying, warehouse, cold storage, co-packing.
- Distribution: pickup, offload/on-load, packaging, delivery.
- Coordinated marketing and sales.
- Start-up/scaling support for local food entrepreneurs — e.g., commercial kitchen, R&D/simulation capacity, guidance.
- Capacity enhancement: e.g., grain dryer, milling, abattoir, produce and meat processing, egg grading station.

The consultation team also committed to continuing to examine where overlapping needs and interests could be drawn together from across the visions.



To get a clear picture of the food system a food hub would operate and take a role in, the team agreed that the following diagram best expresses all elements of a food system. The activities across the middle fundamentally, is the supply chain. The desire in Guelph Wellington is to ensure the supply chain becomes more and more circular over time - this includes an overall increase in local production and application of circular processing.

Why Local?

Local has been something peripheral to the primary food system in this global era. Starting a few decades ago, local food went through a rationalization with the growth of cities. This is changing. The pandemic has shown us that supply chain resiliency is key to strategic sectors, particularly food. Higher priced local food has had “challenging economics” and price and availability have both been a challenge to local food becoming widespread with a more general population, but this is changing in the emerging ”new normal” with a greater focus on sustainability driving broad community interest.

We know local food provisioning systems are not necessarily more circular – but they can be.

What needs to change? Currently the food system in general is too often linear and full of waste/inefficiencies as well as other undesirable outcomes.

In Guelph Wellington, the local food system mainly consists of small players serving people who look at local as a speciality category. Decades of lean production in a global marketplace and ongoing alignment with international supply chains, means there are gaps in the local food system infrastructure designed for smaller scale production. Concurrently, "local food" has developed as a niche. This means it is a higher priced item and still competing with a range of players – to consumers, local can mean Guelph Wellington, Ontario or even Canada.

There is growing recognition that local food is of strategic importance. Given the current state, focusing on Guelph Wellington, there is little in the way of "feasible" infrastructure investments without first or concurrently building non-physical capacities to make the system work. These include the development of skill sets, relationships, champions, and regionally specific business cases.

What's the Solution?

Build a food hub that connects a community of interest around local food focus, using data to match, build, guide, and educate food hub participants.

Like a significant stellar object the Guelph Wellington local food hub will add to the gravitational attraction of the region targeting specifically those with a clear interest in local food and sustainability...

Use the food hub to:

- Reconstruct local food flow with a greater focus on outcomes (in addition to economics) - for example, the opportunity to supply the emergency food system via a local food hub aggregator
- Build relationships for opportunity identification and collaborative problem solving
- Identify and address critical gaps in developing an efficient matching of demand and supply options
- Connect needs with existing services and resources
- Educate on local, circular, and the regional advantage

Findings

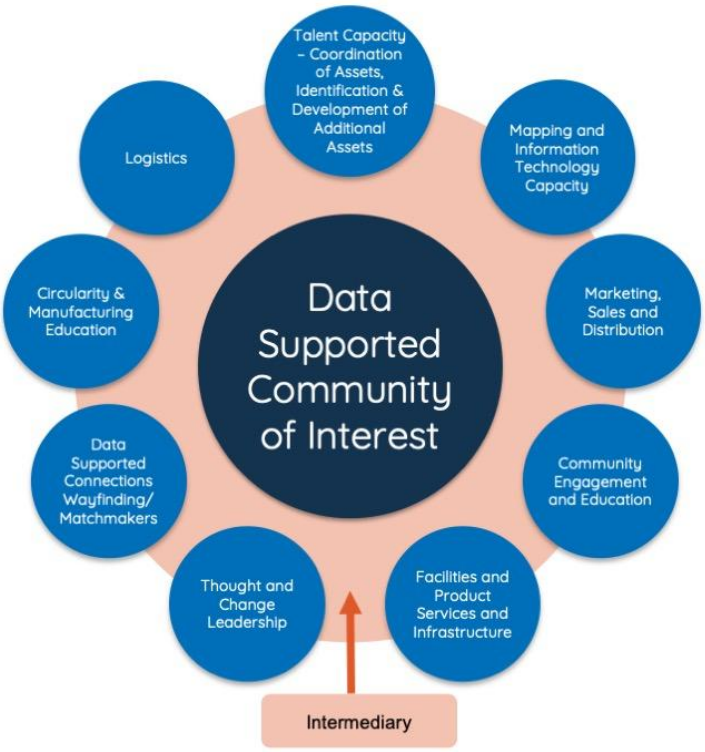
Our research and consultations help define the solution...

- Start small, stay nimble, build momentum and establish value at each step. Based on industry examples, investing in infrastructure at the outset is problematic, business cases should come from the food hub participants themselves. Needs from participants are wide ranging and include:
- Establish a clear vision to build community – clear value for the audiences and interest group(s). Ensure the food hub responds to pull-based needs and gaps in the regional food provisioning system

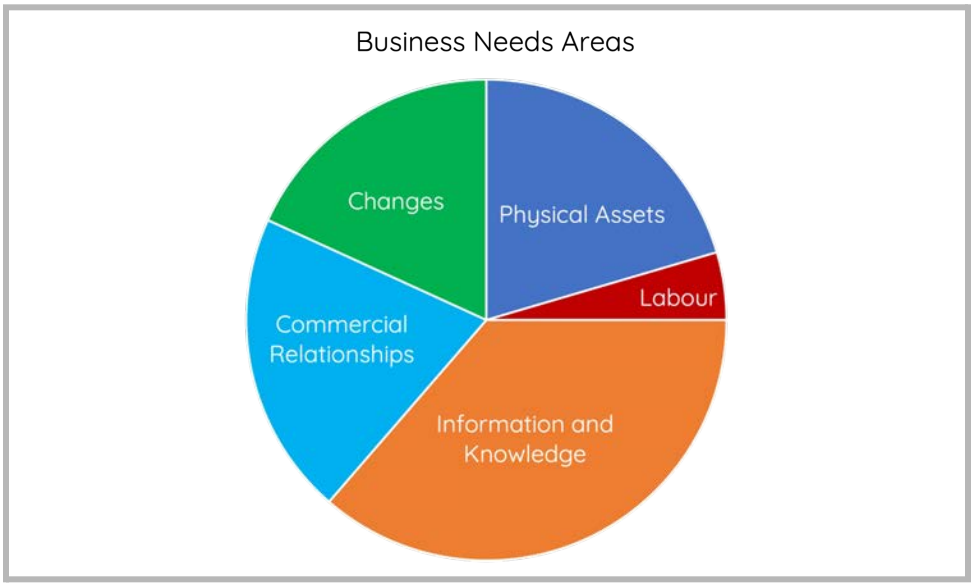
- Create, identify and connect non-physical capacity – start with people and tools then figure out the most efficient ways to address infrastructure needs
- Ensure on-going connectivity and engagement with key community stakeholders, users, and beneficiaries
- The right people in the food hub are key – skill-sets, leaders, champions, and talent with critical competencies
- The right tools are key – access to the right information, problem-solving, and other services. This will include but not be limited to apps like the Resource Exchange and iHub and also programs like COIL

Operationally, in the long-term the hub needs to be run as a business, but public funding may be required to get things started or to accelerate the impact.

A fully realized food hub, with both digital and physical infrastructure could have all of the shared functions pictured here:



Needs Assessment Summary



Needs assessment data from the consultation summaries is found below. Listed beside each need are the current drivers in the support system who can facilitate the needs being met in some fashion. Coordination of these supportive players around specific needs of food systems players and food hub participants will be a strategic move that can move the Guelph Wellington food system toward more circularity and sustainable development.

Needs: Changes	City/ County Ec dev	10C	IG	Taste Real	COIL	Resource Exchange	OMAFRA	SEED	Leader-ship Center Education Partners	National Food/ Manu-facturing partners	Local Food Hub
Fewer layers of bureaucracy	*						*				
Improved equity of access to food aid								*			*
Community involvement in the food system	*	*		*				*			*
Centralization of food system support services											*
Fair compensation for food products											

Advocacy for a more equitable/circular/local -oriented food system	*			*	*						
Greater food security	*							*			
Food that is of a higher quality/fresher			*								
Needs: Physical Assets	City/ County Ec dev	10C	IG	Taste Real	COIL	Resource Exchange	OMAFRA	SEED	Leader-ship Center Education Partners	National Food/ Manu-facturing partners	Local Food Hub
Access to farmland	*										
Commercial space for manufacturing	*										*
Access to tech/equipment											*
Increased processing capacity/Co-packing/Co-production space	*										*
Increased innovation and piloting/product development capacity	*	*	*								*
Logistical support/access to a warehouse	*										*
Space for public-facing food events	*										*
Storage space	*										*
Needs: Wayfinding and Match Making	City/ County Ec dev	10C	IG	Taste Real	COIL	Resource Exchange	OMAFRA	SEED	Leader-ship Center Education Partners	National Food/ Manu-facturing partners	Local Food Hub
Access to accurate information and facts, more accurate data about food insecurity	*						*	*			

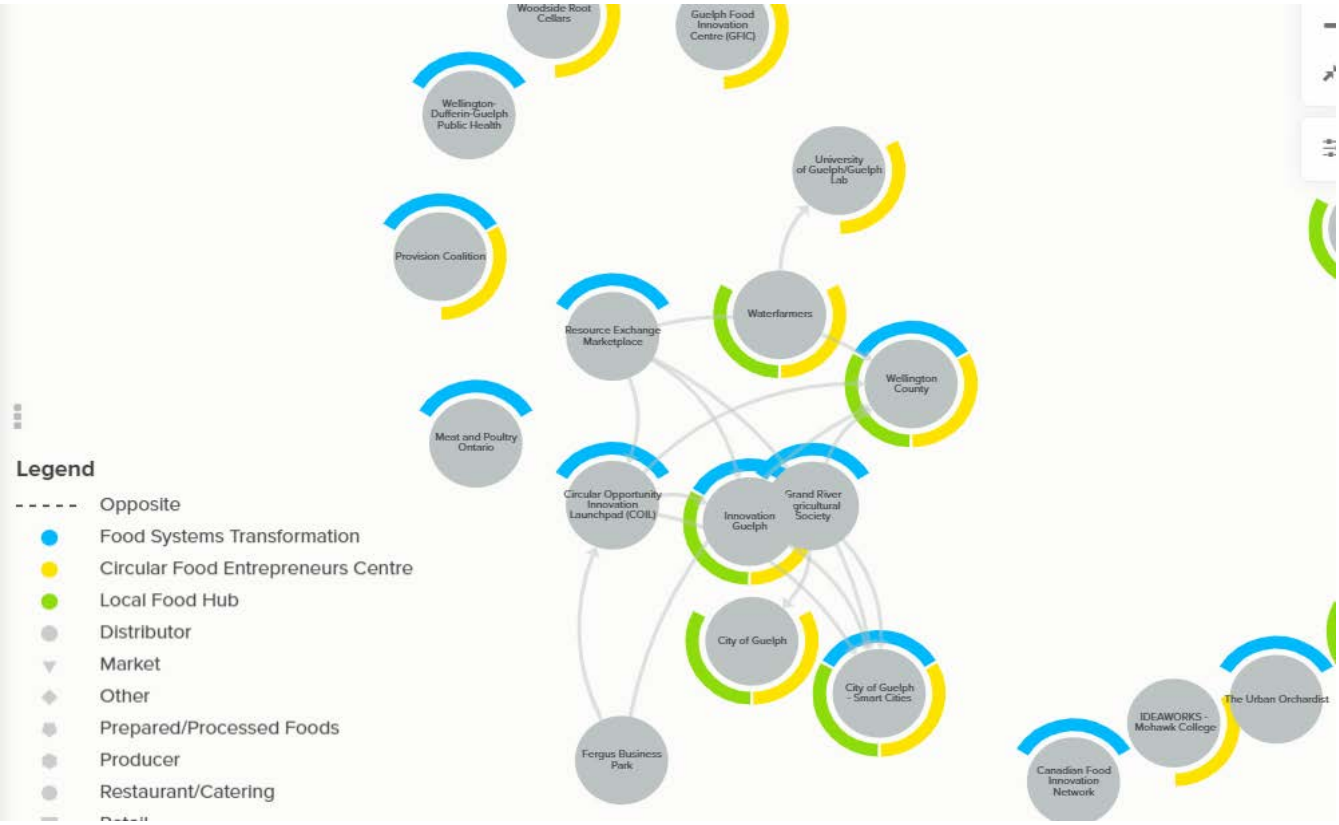
Business assistance for scaling up, Help with marketing/financing/other business services			*		*				*		
Research and development assistance							*		*	*	
Business training/ education courses, curriculum to equip food business owners/food stakeholders with necessary skills			*						*	*	
Consumer education	*			*							*
Shared resources/knowledge	*	*	*	*	*	*	*	*	*	*	*
Easier access to technical information/resources - i.e., either to OMAFRA (which has downsized its outreach) or the UofG							*		*	*	*
Collision space for networking and increased access to business											*
Funding sources/more funding	*						*			*	
Help making operations more circular (i.e. connections with local partners who produce or are in need for waste)					*						
Help navigating regulatory landscape (traceability standards,	*						*				

food safety, labelling requirements, etc)											
Mental/emotional support for food entrepreneurs due to the difficulties of starting up a food business											
Matching business needs to existing services that are currently available	*	*	*	*							*
Permanent staffing at a food hub to ensure consistency and sustainability											*
Needs: Commercial Relationships	City/ County Ec dev	10C	IG	Taste Real	COIL	Resource Exchange	OMAFRA	SEED	Leader-ship Center Education Partners	National Food/ Manu-facturing partners	Local Food Hub
Access to local suppliers, retailers, other partners	*			*	*	*					*
Aggregation of local supply to decrease the risk for large-scale buyers like restaurants	*			*							*
Consumer access to local producers	*			*				*			*
Delivery of local foods (perhaps through some kind of e-commerce platform)								*			*
Distribution support											*
Easier access to capital	*									*	*
Greater buying power											*

Labour

- Increased access to labour was cited by a small number of consulted organizations. Increasing the labour pool is an economic development priority.

Additional drivers can play a supporting role beyond the ones named above already engaged in the local food hub. Additional food system support players would be part of the growing ecosystem map.



Ecosystem Analysis

Food Hub Mapping

Identifying as an ecosystem enables a de facto food system to become aware of itself. An ecosystem that is aware of itself has defined outcomes and coordinates the activity of multiple players to reach them. Working as an "ecosystem" means that players within the ecosystem are willing to be coordinated. Players retain individual agency and take responsibility for providing a unique value proposition in the ecosystem, examples include, provide funding, provide knowledge, produce food, supply packaging, and build food system capacity. An ecosystem exists to be an engine for mutual gain and overall performance that trends positively for all parties.

Ecosystem mapping enables us to see a rolodex of participants and easily sort for what categories they fit into and how they are already connected.

The overarching purpose for any food hub is to aggregate needs and resources for mutual benefit. Generally, benefits that are long-lasting are designed by actors in the food system and are based on data. Alignment with regional priorities and features is important. Governing bodies and program owners can use the information to make decisions about future activities.

The purpose of local food ecosystem mapping is to provide information to organizers and through opt-in processes, in time, information to directly assist participants. Food hub ecosystem mapping enables us to:

1. Identify prospective food hub participants from a region.
2. Map existing connections in order to understand them, build on them and see where the nexus points on the maps are (the connections that the most connections run through - i.e., for Guelph Wellington these would be farmers' markets, programs like Taste Real, COIL, and iHub).
3. See where the Food Hub ecosystem can create connections between nodes.
4. Determine who (participants) and what (data points, i.e. needs, certifications) need to be added for future versions of the map to continue to build toward an ecosystem that "feeds" the food hub with active participants and a growing community of interest.
    a. Design additional data fields.
5. Look at the balance of ecosystem elements:
    a. How many distribution channels compared to processors and producers?
    b. What do we need within our region and from across a larger region in terms of infrastructure?
    c. Of the total population, how many organizations are involved in the social system? Circular practices?

Goals for Guelph Wellington Local Food Hub Mapping: Using a Sample

Goals of a Guelph Wellington local food hub are to distribute, sell and redirect more local food in an increasingly circular way. Per the Local Food Hub Elements diagram, there may be multiple ways this is accomplished.

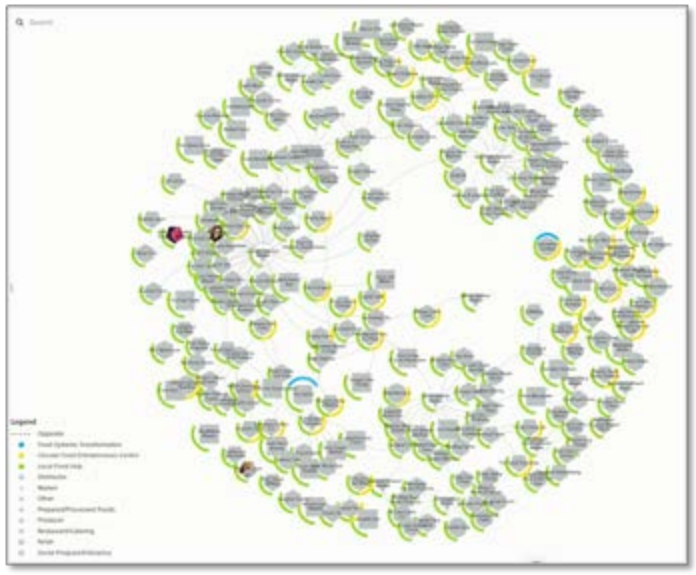
Setting a sample target and research question framed in economic terms, what would it take to produce 20% to 30% of a food basket locally as a first step toward circularity?

Imagine $75 - $150 million is an average amount for 100,000 consumers (or 30,000 households) to spend on food.

- To serve 20% to 30% of a market of the sample size the market, we would be looking for local sales of $15-$30 million.
- A viable small scale food processor is going to have to earn $100,000 to $200,000 per year to be viable full-time.
- We are then looking at a system that might support up to 150 healthy, small scale producers.

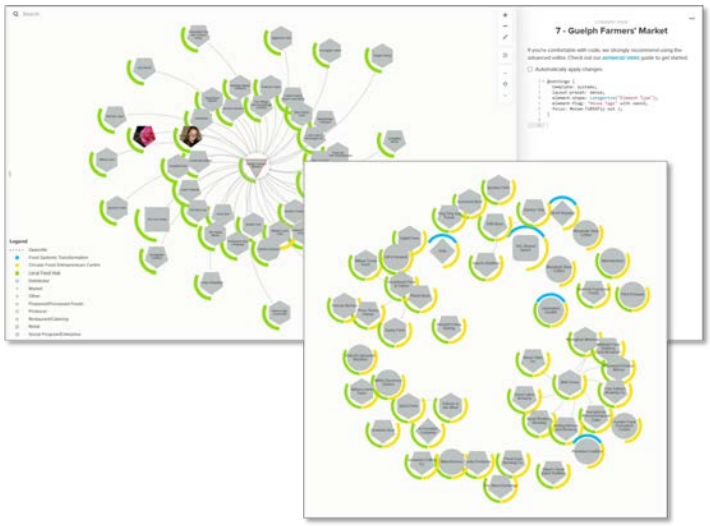
Against a goal like this sample goal above, the maps tell us who is already in the ecosystem:

Type	Grand Total
Church	2
Circularity Resource	6
Consultant	13
Distributor	4
Government/Institution	11
Incubator	5
Market	10
Network/Association	6
Prepared/Processed Foods	82
Producer	95
Restaurant/Catering	15
Retail	32
Social Program/Enterprise	19
Think Tank	6
Upcycler	4
Other	3
Total:	**313**



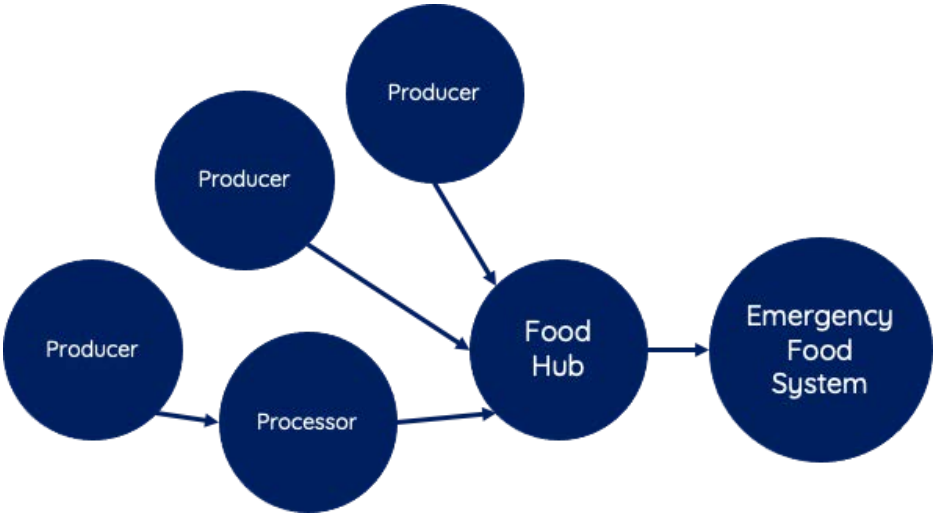
And how they are connected:

Connection Type	Count
Collaborator	30
Contributor	6
Supplier	87
Upcycler	3
Vendor	137
Education	1
Grand Total:	**264**



Questions that remain

- Where/how the emergency/social food system further links in. If the emergency food system is, when consolidated, a mid-sized player how can a reliable supply be established through a food hub?



- As we start to resolve knowledge and infrastructure issues in the ecosystem, who has interest in being involved? Where can immediate connections be made and what are the needs on either side of the connections?

RESEARCH

RESEARCH

Literature Review

Summary Findings

The various strategies to strengthen existing food systems tend to focus initially on underlying economic imperatives through commercial support activities such as:

- enhancing capacities in the local food ecosystem;
- supporting business start-ups through incubator/accelerator approaches;
- driving innovation and adoption of production efficiencies; or
- creating a platform for resource exchange, networking and promotion of partnerships/collaborations.

These activities are meant to spur regional economic growth and support local food production by looking for ways to enhance regional production/processing capacities and expand the market reach for local foods.

Striving towards a circular food economy tends to be aspirational, challenging the economic drivers to also address social (food security, nutrition, equality, etc.) and environmental values (reduced carbon footprint, reduced consumption, waste diversion, etc.). This additional layer may not always align with economic imperatives, especially in the short-term, where the priority is on profitability, fiscal sustainability, and economic growth.

The areas of focus define the mission, values, and core activities of a particular food hub or foodshed model in accordance with the priorities as established by a specific jurisdiction. The question then is to determine what issues or challenges are to be addressed within the regional food ecosystem? Is it promoting food production/processing/consumption? Is it to support food business innovation and growth? Is it to influence the decision-making and behavioural trends of key actors within the regional food system to align more with circular food system values, and best positions the food ecosystem for the challenges of the future?

Answering these questions will help to determine the “best” model for a food hub in a specific jurisdiction. Notably, the final result may point to not one, but several food hub models that could be integrated under a foodshed umbrella.

Below is a comparative table, reflecting various food hub and foodshed models shapes depending on the specific entity’s priorities regarding focus and intended outcomes.

	Food Hub	Foodshed	Foodshed	Think-Tank	Think-Tank
Case	OCC Policy Brief (Ontario)	ACEnet (Appalachia Ohio)	FOOD21 (Pennsylvania +)	CAPI (Canada)	SITRA (Finland)
Core Function	Sector Recovery and Growth	Regional economic development	Regional economic development	Sectoral policy leadership	Influencing Change
Mission	• to grow a more resilient, globally competitive food supply chain.	• to grow the regional economy.	• to grow the regional food economy.	• to ensure growth and prosperity in the national agri-food industry.	• to build a fair, sustainable, and inspiring future.
Values	• expanded access for local producers to cold storage, packaging, marketing, retail, and distribution channels throughout the province.	• network building, innovation support, and collaboration facilitation.	• expanded local food business opportunities, inclusive participation, environmental responsibility, and increased access to nutritional foods.	• a place for agri-food leaders to come together, share insights and advance ideas on emerging agri-food issues in Canada.	• supporting an ambitious climate policy, promoting a fair and competitive circular economy, and encouraging sustainability.
Tools	• shift to virtual farmer's markets, improvements in on-line sales infrastructure, and increased investments in food hubs.	• food centres offering incubation space — i.e., commercial kitchen, meat and produce processing facilities, cold storage, etc.	• resource centre to grow capacity and encourage investment in the regional food system. • platform for innovations. • publications and webinars.	• respected national agri-food think-tank — i.e., engaging government, hosting events, releasing publications.	• administration of investment fund. • respected national and international think-tank — hosting events, releasing publications.
Beneficiaries	• Provincial agri-food sector, especially producers.	• Small producers, processors, and SM food entrepreneurs.	• Small producers and small-to-medium food entrepreneurs.	• National agri-food sector.	• Innovative food entrepreneurs targeting circularity values.
Desired Outcome	• expanded market for locally produced foods.	• resilient, competitive, and inclusive regional economy.	• resilient, competitive, and inclusive regional food system.	• globally competitive national agri-food sector.	• international transition to circular economy.

Environmental Scan

Why a food hub?

The existing linear food economy is the entrenched status quo, and not easily displaced. There are strong rationales for attempting to do so, but such aspirations must overcome convenience, efficiencies and profitability that have been built and improved upon over time.

The drive to shift the focus from global configurations to the regional or community food system arises from mounting concerns regarding food security, proximity of production, self-reliance and sustainability.[13] The oft-voiced rationale behind reform focuses on attaining greater access to local foods, bolstering local production, and increasing community access to fresh, nutritious foods. Although already topical, the COVID-19 pandemic has given greater prominence to concerns related to regional food security and food system resiliency.

Various jurisdictions have identified food as a driver for pursuing regional economic development. Food hubs are regarded as the obvious solution. The prominently held perception is that establishing a food hub would introduce more dedicated, locally-driven infrastructure designed to increase the viability of the regional food system. Food hubs are framed as a strategy to scale up local and regional food systems, specifically by increasing market access for small and mid-sized operations.

Long-term viability appears to be an issue, but after successful establishment, these hubs or networks can become a catalyst for environmental and social justice pursuits. That is, over time successful establishment allows a shift in focus and activities away from solely commercial-oriented pursuits, towards addressing other community challenges involving social inequity, nutritional access, or ecological sustainability.

The range of approaches to food hubs is as varied as the jurisdictions that espouse or have managed to adopt a version of them. Two ends of this spectrum have been identified and differentiated as follows: at one end, the focus is on values-based, agri-food supply chain management, while at the other end, the focus is more on sustainable food community development.[14]

The values-based supply chain end of the spectrum involves primarily for-profit businesses and tends toward a supply-side approach. Here, the operations of the food hub focus on the aggregation, distribution, and marketing of food products primarily from local and regional producers to meet local wholesale, retail, and institutional demand.

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[13] https://s30428.pcdn.co/wp-content/uploads/sites/2/2019/09/Primer_1.pdf

[14] Berti & Mulligan (2016)

On the other side of the spectrum is the sustainable community development model, which is generally led by a network of grassroots, community-based, not-for-profit entities that work together to build a more socially just and ecologically sound food system.

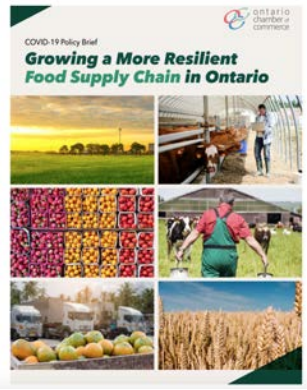
The vast literature on food hubs reflects the diversity of approaches used to challenge — or not challenge — the conventional linear food system paradigm. The tensions of grappling with how (or even if) to engage in pursuits that may not be directly or immediately profitable — such as those that focus on social justice objectives and/or pursue environmental goals — is evident.

Leaving aside for now the logistical matters of appropriate business model, financing, and timetable from the complicated equation of food hub feasibility and sustainability, the discussion below offers an overview of various types of food hub or foodshed models, as a cross-section of this vast spectrum.

Rethinking Regional Food Systems

Below are various case studies, where efforts are being considered or have been made to reinforce the existing regional food system and organize capacities and strengths around a food hub or foodshed model, and/or pursue transformational values aligning with the principles of circularity.

Case #1: The Ontario Chamber of Commerce (OCC) Policy Brief [15] was developed in partnership with the Beef Farmers of Ontario, Durham College, and the Ontario Federation of Agriculture. The policy brief addresses the perceived weaknesses in Ontario's food supply chain exposed by the COVID-19 pandemic, culminating recommendations to increase support for local foods — increased support for farmers' markets, e-business infrastructure, and the creation of food hubs across the province. The food hubs are seen as the means to establishing greater access to refrigerated storage, packaging, marketing, and distribution channels for local producers, and better connecting local farmers to local consumers.



The OCC policy brief considers both the new challenges confronting the regional food supply chain (such as the growing demand for local food, the shift to online sales, and rising concerns regarding food insecurity), as well as the existing vulnerabilities to the regional food system (such as shortcomings in government income support for farmers and the need to fill the agricultural talent pipeline).

A key recommendation of the brief is a call for greater provincial support to facilitate the sourcing of local foods by consumers and the food service industry, and for food hubs to help local farmers increase production and better access refrigerated storage, packaging, marketing, and distribution channels. There is no definite definition offered on

[15] https://occ.ca/wp-content/uploads/COVID19-Policy-Brief-Food-Supply-Chain-final.pdf, 2021 Policy Brief, Ontario Chamber of Commerce.

what is meant by a “food hub”, or what a network of provincial hubs might look like, or how they might interact and coordinate with one another.

In Ontario, the concept of a food hub has become popular as a model for re-establishing farm-to-city linkages, shortening the distance for food travel, and improving community access to fresh, healthy food. The food hub model is seen as a means of bringing small-to-medium sized entrepreneurs together in a dedicated, local food aggregation facility, making otherwise unaffordable operations more sustainable.

In the recent past, there have been various examples of efforts in Ontario to facilitate sustainable local food systems, including Toronto-based organizations like FoodShare and The Stop. However, based on defining regional food hubs as facilities acting as centralized distribution points for strictly local foods, there are currently no regional food hubs in the province. There are projects in development, and projects that have come and gone. One ever-present factor (for provincial government support in any case) is how an emerging regional food hub would operate alongside the very successful and entrenched Ontario Food Terminal.[16]

Case #2: Appalachian Center for Economic Networks (ACEnet) is a community-based economic development foodshed serving the Appalachia region in Ohio. Established modestly in 1985, ACEnet has grown into a sophisticated network of facilities and partnerships offering regional businesses with the following services:

- direct technical assistance to business owners,
- food processing, aggregation and distribution infrastructure, and
- office space and amenities for small business start-ups.

Through these services, ACEnet assists food businesses with business planning, product development, label design & printing, marketing, regional brand access, and financial management. These services are provided through several support facilities, including a Food Ventures Centre with a commercial kitchen, a Food Hub distribution centre, and a Food & Farm Enterprise Centre that houses licensed meat & produce processing facilities.[17]

ACEnet based itself on a model discovered in northern Italy, where some 19 communities organized themselves into networks to assist small manufacturers (twenty employees or less) to better take advantage of emerging niche markets. These business network formations experienced substantial economic revitalization, new businesses development and dramatic increases in the standard of living for low-income individuals. Like the Italian

[16] https://sustainontario.com/2012/06/18/regional-food-hubs/

[17] https://acenetworks.org/central-appalachia-food-corridor/. The Central Appalachia Food Corridor’s mission is to create sustainable jobs in local food production and distribution in Southwest Virginia, Eastern Kentucky, West Virginia, Eastern Tennessee and Southeast Ohio primarily by connecting producers to wholesale and retail outlets searching for local products.

community models, ACEnet focuses on regionally sustainable, community-based economic development.

Case #3: FOOD21 Pennsylvania identifies as a western Atlantic foodshed, acting as a catalyst for developing new methods for organizing resources to achieve regional growth in the local food economy. FOOD21 focuses on four programming areas:

- support for regional food businesses;
- expanded opportunities for on-farm income of local producers;
- a resource centre that uses data to focus efforts on capacity building and encouraging investment into the food system; and
- a platform for social impact innovation across the food system.[18]

FOOD21 began in 2018 as a non-profit organization. The foodshed encompasses a growing array of activities, including the following:

- Food Business Accelerator — a platform to enable regional food makers and culinary businesses to achieve scale and financial sustainability. FOOD21 partners with the Pittsburgh Food and Beverage Network and the University of Pittsburgh. Recently, FOOD21 partnered with several local accelerator organizations to deliver food business support specifically targeting minority food-based entrepreneurs.
- Farm Working Group — promote more locally grown inputs for the craft beer and spirits sector; investigate turnkey solutions for farmers to develop low-cost, on-site energy resources and build commercial, year-round on-farm growing facilities; and advocate for the use of food hubs, aggregation centres, small scale mobile transportation and other technologies to support local growers.
- Center for Data Analytics and Strategy — working with growers, food entrepreneurs, public policy makers and academic institutions to apply data and research on analysis of the challenges affecting the regional food system and development of solutions.
- Oasis Grocery — an on-line grocery and delivery initiative being piloted in Pittsburgh, with the intent of eventually extending the reach to food challenged communities across the region that lack access to quality and affordable food.
- InCity Farms — a partnership that began in 2019 to develop a network of large-scale, commercial aquaponics centres across western Pennsylvania and eastern Ohio.

In addition to the above, FOOD21 issues topical papers and hosts webinars on various issues and challenges affecting the regional food economy.

Case #4: Canadian Agri-Food Policy Institute (CAPI) was established in 2004 as a place for agri-food leaders to come

[18] https://www.food21.org/food21-programs. Food21Pennsylvania encompasses a region consisting of approximately 15 million people and over 7 million acres of farmland.

together, share insights and advance ideas on emerging issues facing the Canadian agri-food sector.

CAPI's work reflects systems thinking, researching complex and interconnected food issues, and bringing diverse voices to the table. The Institute's vision is to provide global leadership in trusted sustainable agriculture and food systems that enhance the health, wealth and well-being of Canadians. The perspective is to reinforce the strengths and capacities of the national food system, acknowledging the importance of global interconnections to advance solutions and drive progress.

CAPI is a respected national voice on emerging and pressing agri-food policy issues. The Institute brings together sector leaders and experts, hosting events (from focused dialogues to major conferences) and releasing publications (newsletters, policy briefs, research papers) throughout the year.

Rethinking the Linear Food Economy

Beyond the promising opportunities of regional food systems as a driver for economic development, there is growing interest in addressing broader issues related to the environment, poverty, social equity, and systemic food security. Organizations are becoming increasingly engaged in cultivating circular food economies.[19]

Case #5: SITRA is a Finnish foundation which administers an investment fund worth about EUR$30 million/annum, originating from an endowment from the Finnish government.[20] SITRA also acts as a think tank to promote the transition to a circular economy through the following:

- focusing on services instead of products;
- promoting the use of renewable and recyclable materials as well as renewable energy in product design and manufacturing;
- maximizing the usage of goods and resources and extending their life cycles by using digital platforms for renting, selling, sharing, and reuse;
- using products according to their original purpose for as long as possible or enabling multiple instances of reuse through means such as maintenance, repair, and refurbishment;
- promoting resource efficiency and recycling; and
- identifying circular economy enablers to help transition to a circular economy by developing circular data management and communicating the benefits of circular economy solutions.

[19] https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy

[20] The Bank of Finland and the Finnish Parliament gave SITRA an endowment capital of approximately EUR$84 million. This endowment capital acts as the foundation for SITRA's current investment assets. At the end of 2020, the market value of SITRA investment assets was EUR$976 million.

SITRA strives to establish smarter economic models and in the course providing information, tools and solutions for the implementation of change.

The Foundation has recently sought to extend its influence beyond national borders, on the realization that many circular economy solutions require international buy-in to effect change. SITRA therefore works with the Finnish and EU governments and international development banks to promote and accelerate the global transition to circular economy values.

Analysis

The range of food hub/foodshed models in existence or envisioned reflect the local strengths, capacities, and ambitions for a stronger, more resilient and sustainable economic future for a designated region — whether that be a municipality, region, country, or globally (as with the aspirations of SITRA).

A core inspiration for establishing these networks is targeting economic development and investments towards the promotion of local food production and an enhanced infrastructure that promotes access to local foods. These commercially-driven initiatives focus on expanding the profitability of local farmers and the market for local foods, establishing the appropriate infrastructure to connect the two, while also providing business supports to local food entrepreneurs and culinary businesses.

In response to perceived structural gaps in the existing regional food system, these alternative models of "farm to fork" chains seek to establish new food production, distribution, and logistic networks between small scale farmers and food entrepreneurs, retailers, and local consumers. A common value compass emerges along the following principles:

- transparency — traceability, preference to local composition of products and modes of production;
- equity — encouraging entrepreneurial initiative where traditional structures (e.g., farmland costs, regulation) are prohibitive for new entrants, increased opportunity for the small-scale producers; and,
- access — improved local capacity to process, store, package and move locally grown food to local consumers, greater access for lower income groups.

Driving towards a circular food economy adds an additional layer to the regional economic development quest, redirecting the focus to advancing social principles — e.g., environmentally friendly farming; waste reduction and/or re-use in processing/manufacture, retail and food consumption; addressing inequities and food insecurity, etc.

The circular model attempts to create closed – or circular – provisioning systems to disrupt the prevailing linear food model. However, a long history of market forces have molded production methodologies and supply chain flows into the vast global network that exists today. Advancements in storage, processing and distribution technology — all have contributed to food supply chain flows that vastly improve and extend perishability and distribution limits.

A clear acknowledgement of the intertwined, global nature of the marketplace for food and its intersect with the Canadian food system, is the 2017 Barton Report. The Barton Report set a growth target of $85 billion in agri-food exports by 2025 to motivate the Canadian agri-food sector to become the second largest food exporter in the world. The report directly ties the potential for future national sector growth to trends in the global food economy.[21]

Guelph Wellington consumers[22] — as is the case in most of the western world — have become accustomed to an international food plate accommodating an international palate. The vast majority of food produced in and around Guelph is exported, rather than being processed or consumed locally. Most foods available at retail are imported to the region, including those produced within the region.

The status quo is a hurdle for circularity advocates. Promoting circularity principles relies on identification of what is reasonable, demonstrating the doable, and inspiring incremental value and behavioural change towards loftier end goals. There is no easy or quick transition towards a circular food economy. There is always resistance to change, and post-pandemic recovery considerations may make movement in this direction even more challenging[23].

Choosing the Optimal Approach

An environmental scan of various food system visions and models demonstrates a common underlying goal towards economic growth and sector resiliency. Common activities include:

- enhanced local/regional capacities for small/medium food processing/manufacture;
- supporting business start-ups — through incubator/accelerator approaches;
- driving innovation and adoption of production efficiencies;
- creating a platform for resource exchange, networking and promotion of partnerships/collaborations.

Beyond the economics of regional growth, structures have been established as influencers, looking to succeed on the economic front but also taking on activities that (1) add momentum to efforts advancing circular food economy principles that address

[21] https://www.ic.gc.ca/eic/site/098.nsf/eng/00022.html, Report of Canada's Economic Strategy Tables: Agri-food

[22] The City of Guelph and the County of Wellington have a combined population of close to 223,000 residents. The County of Wellington (County) is largely rural — primary cash crops include corn, wheat, and soybeans; animal production consists mainly of dairy, beef, poultry, and swine.

[23] See SMEs between financial resilience and a digital and green investment surge – a trade-off that should not be, Dr. M. Schwartz et al, KfW Research, No. 306, 27 November 2020. The finding is that SMEs are prioritizing financial resilience and pivoting away from prior investment intentions, at least in the short-term. Currently, businesses are disinclined to make the necessary capital expenditures to tap into emerging growth areas and transition to a digital and climate-neutral economy.

environmental, food security, and inequality issues; and (2) inspire change and transition through leadership, advocacy, and example.

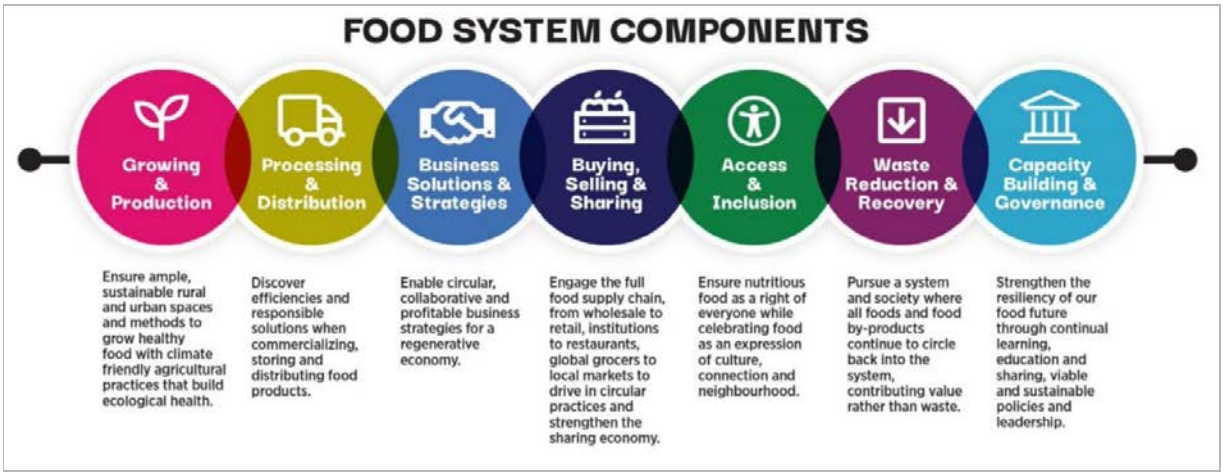
The various case models identified above point conceptually to three general categories of food hub activities:

1. Commercial capacity building — offering commercial kitchen space, R&D and simulation capacity to support innovation and scale-up, meat and produce processing, cold storage, packaging and distribution facilities. The food hub is focused on providing support to local food producers and entrepreneurs.
2. Business services support — establishing a networking hub, collision space for sharing business expertise, mentorship, shared space for piloting innovations, business start-up resources, and support. The food hub is focused on providing support to emerging food business entrepreneurs.
3. Systemic reform — adopting the insights of data to identify patterns of opportunity, supporting transformational projects, and influencing change through leadership and public advocacy.

There are overlaps in the specific services provided between these food hub categories, but the distinction between the categories is in focus and function. Depending on a number of factors, there may not be one optimal food hub model. Priorities and resources within a jurisdiction may point to a combination of the desired or needed activities to strengthen the regional food ecosystem, which perhaps can be accomplished through incremental expansion of services over time under the umbrella of a foodshed.

The Guelph Wellington region has already identified components of a circular food system that it deems essential, as described in the schematic below.[24]

[24] Towards a Circular Food System in Guelph Wellington, Presentation - July 2021, Metabolic, Our Food Future/Guelph-Wellington, Dillon Consulting, University of Guelph.



This listing is helpful in determining the priorities that are distinctive to the Guelph Wellington region, offering guidance in evaluating priorities and preferred direction. Securing each of these components to strengthen the regional food system speaks to a delicate mix of community buy-in, political buy-in, and resource allocation.

The optimal food hub model takes into account the unique attributes of the region it represents, but also carefully considers the intended architecture against the future needs and demands of those dependent on a healthy, resilient, and sustainable food system. This means cataloging and understanding the various drivers underlying the existing food system, articulating the desired outcomes, and then considering how best to impact the various components of the food system to achieve those outcomes (see schematic of a food system in Attachment I: Conceptualizing a Food System).

It is worth noting that established food hubs or foodsheds have undergone an evolutionary process over time, using economic-driven successes in strengthening regional food infrastructure capacities as stepping stones towards establishing a leadership presence to help shift long-established norms in the existing food economy.[25] Food hub profitability is a necessary springboard to achieving broader mission-related goals.[26]

Other Considerations: Feasibility and Sustainability

This stage of the investigation has focused on models for entities directed at reinforcing or reshaping the food economy — whether a food hub or foodshed — and looking at the core

[25] See Food Hubs: 10 Lessons on Viability, J. Barham, J. Matson, St. Louis Fed (2019), which describes the 'Oxygen Mask Rule of Financial Viability': as socially-driven entities look to secure both economic and social benefits, they lose focus on the economic bottom line in their efforts to maximize the social mission. The food hub must first secure its own oxygen (i.e., profit margin) before assisting others with their oxygen (i.e., community benefits). As research has shown, "

[26] Counting Values: Food Hub Financial Benchmarking Study, Farm Credit East, Wallace Center at Winrock International, Morse Marketing Connection and Farm Credit Council (2014).

activities which might resonate with the community needs of Guelph Wellington. What has not been considered in depth at this early stage are organizational considerations regarding the commercial orientation, public/private involvement, and fiscal sustainability of the various models.

Apart from direction and core activities, a sound business model for any entity will be key to long term success. The for-profit/not-for-profit mix in structuring the foundation of a potential food hub will be determinative of the appetite for undertaking commercial versus more social and community building endeavours.

Not-for-profit food hubs have several advantages. First, they can operate with less immediate profit-generating expectations than for-profit businesses, offering greater flexibility for solving logistical problems. This helps to generate deeper roots and credibility within the community. The downside is that they often are dependent on donations and grant funding for continuation, which threatens the entity's overall resilience, future planning, and community impact.[27]

Risk aversion is also another key consideration. Not many for-profits (or even not-for-profits, over the long term) have the risk stamina to absorb successive investments and not become fiscally self-supporting in the near horizon. The reasonable expectation is a 5-10 year window before reaching fiscal sustainability[28], starting modestly and with sufficient flexibility to allow for adaptation after several years of operational experience. The first five years of operation for food hubs are shown to be the most dynamic, as entities learn, adapt, and seek to evolve to more mature, stable organizations.[29]

The prevailing recommendation from the research literature is that even not-for-profit food hub management structures need to operate like a for-profit businesses — i.e., establish a viable and sound business model. The core objective should be to achieve long-term financial sustainability, or risk failure and dissolution.[30]

An established food hub will be able to balance its activities and services with those community needs that are not necessarily economically efficient or profitable, but may be priorities for ensuring a vibrant local food ecosystem.

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[27] Building Resilience in Nonprofit Food Hubs, J.R LeBlanc, D. Conner, G. McRae, and H. Darby (2014), Journal of Agriculture, Food Systems, and Community Development, 4 (3), 121-135.

[28] Even solely commercially-oriented pursuits, such as food incubators, experience investment and long-term viability challenges. See What Are Food Incubators and Do They Create Viable Businesses? How the tech-inspired model translates to kitchens, Tove Danovich, Eater, 26 February, 2016.

[29] Building Resilience in Nonprofit Food Hubs, ibid, p. 128. Contemplated changes within the first five years included changing ownership models, converting to a food centre rather than a food hub, mergers with other organizations, expansion/downsizing, amending price structures and product offerings, changes in aggregation and distribution methods, and revising farmer or consumer participation.

[30] Ibid, p. 133.

Conclusion: Next Steps

The task at hand is to choose an approach that would work best for Guelph Wellington. The ideal would be to establish an entity that could deliver on all the possibilities — i.e., to support regional economic growth, strengthen the existing food system, and at the same time influence decision-making and behavioural trends of key actors within the regional food system — at a personal, business, or governmental level — to align more with circular food system values.

These desired outcomes are unlikely to be accomplished through a single entity and all at once. Achieving these goals will involve hard decisions on priorities: which food system gaps to address or overcome first, which group of stakeholders is in most need of immediate support, etc. A nuanced, phased implementation approach that best meets the prioritized outcomes can then be developed on a strategic timeline.

The subsequent stages of this feasibility study will look at establishing a greater understanding of the Guelph Wellington food system through consultations with key stakeholders in the region. This ground-level feedback will identify perceived gaps or weaknesses in the system and will help to prioritize those aspects of the regional food economy that need to be strengthened or modified.

These inputs will establish the groundwork for further analysis regarding the parameters for sustainability or feasibility of the various potential food hub directions identified above, as applied to the needs and priorities of the Guelph Wellington food ecosystem.

Case Studies

Summary Grid - Food-Specific Hubs

Name	Business Model	Services Offered	Funding	Physical/ Digital
Eastern Ontario Food Hub United Counties of Prescott and Russell (Alfred?), Ontario Yet to open	Owned by county	Abattoir, cold storage, processing (of food by-products), production of ready-to-eat foods, marketing, and distribution services for meats, fruits and vegetables	The project is budgeted at $36 million; the county has committed to $2.5 million, provincial and federal grants are expected to contribute $12 million, and the remaining $21.5 million will be covered by private investors	Physical
TWO RIVERS FOOD HUB Smiths Falls, Ontario In operation	Owned by private investors	Commercial kitchen rentals, processing, storage, online platform to give buyers access to local products (previously offered distribution as well)	Funding sourced from Trillium, OMAFRA, the Eastern Ontario Development Program, county-level and municipal government, the Greenbelt Fund, and the Collaborative Economic Development Program	Both
ACEnet GROWING OUR REGIONAL ECONOMY Athens and Nelsonville, Ohio In operation	Owned by private investors	Technical assistance to business owners, processing, aggregation, distribution, production, packaging, labelling, and marketing capacity for food entrepreneurs, as well office space for small businesses	The program is funded primarily by incubation fees (65%), with the rest contributed through federal, state, and foundation grants from 21 supporting bodies	Both
ASTORIA FOOD HUB Astoria, Oregon	Owned by private investors	Cold and dry storage, a commercial kitchen, distribution resources, restaurants, a retail storefront, support resources for regional food producers, online store	The $700,000 necessary to cover initial costs was raised through a crowdfunding platform; 164 investors contributing between $100 and $20,000 participated in this effort	Both

Yet to open				
food21 Pittsburgh, Pennsylvania In operation	Owned by private investors	Planning and analysis for investors looking to participate in the local food value chain, data analysis for food stakeholders, start-up assistance for food entrepreneurs	Blend of public/private	Digital
Athens Locally Grown Athens, Georgia Closed	Owned by farmers	Online market connecting consumers with local, small-scale producers	All members paid a one-time $20 fee to access the platform	Both (but primarily digital)
the grove. HARVESTING INNOVATION London, Ontario In operation	Owned by private investors	Includes incubation space, featuring shared production equipment, packaging and storage, as well as acceleration space, with office and meeting facilities as well as opportunities for business-to-business collaboration - its digital wing is called Grove 365; it features educational content and hosts an online store	The facility received federal support through the Federal Economic Development Agency for Southern Ontario	Both
DFO Innovation Program In operation	Owned by private investors	Participants move through either the Start-Up stream, where they can access mentoring from specialists and sketch out a business plan. There is also the Scale-Up stream, where participants have access to further mentoring and can receive up to $10,000 in matched grants from DFO	OMAFRA	Digital

GWILLIMDALE FARMS Bradford, Ontario In operation	Owned by farmers	The farm grows carrots, potatoes, beets, onions, parsnips, and other products which are washed, packed, and delivered to major as well as independent retailers using farm-owned transport trucks. No direct-to-consumer services are offered by this organization	Unclear; business-to-business sales appear to make up most of this farm's revenue	Both
Highlands East Food Hub Wilberforce, Ontario In operation	Owned by private investors	The food hub sources bulk donations from Feed Ontario, Kawartha Food Share and Kawartha Lake Food Source, donations which are used in four ways - food is provided to those who use the Cardiff and Wilberforce food banks, shared with other food organizations and food banks (in case of surpluses), and used for meal preparation at the food hub (the Community Cooks program)	The food hub received an $141,000 investment from the Ontario Trillium Foundation	Physical
FEED ONTARIO Serves the entire province In operation	Registered charity	Feed Ontario provides food banks in the province with a variety of food products year-round, they give food banks the resources they need to expand community food programming, and they research and advocate for policy solutions designed to cut back on food insecurity and poverty	Feed Ontario posted $1.4 million in revenue from donations and special events in 2019	Both
puget sound food hub farmers cooperative Puget Sound, Washington	Owned by farmers	A farmer-owned cooperative that sources, aggregates, and distributes locally-produced food to a variety of institutional buyers such as restaurants and hospitals from 84 producers in the region. Farms that have received	The food hub was launched with the support of the USDA Rural Development Program, although its activities are supported year-to-year with one-time payments of $250 for farmers looking to join the food hub and annual	Both

In operation		orders pack and deliver their food to two aggregation points, at which point the food hub manages customer pick-up/delivery. The food hub also provides marketing support to help producers reach a greater number of potential customers	payments of $100 for members and $150 for vendors	

Summary Grid - Non-Food-Specific Hubs

Name	Business Model	Services Offered	Funding	Physical/ Digital
CATALYST 137 Waterloo, Ontario In operation	Owned by private investors	Office space and co-working facilities, and includes a restaurant, coffee shop, and gym - allows entrepreneurs to access funding and know-how (not limited to food businesses)	Renovating the space cost $55 million and was financed by a local developer and real estate firm	Physical

Descriptions

Eastern Ontario Food Hub

This brick-and-mortar, federally regulated facility will be located in the United Counties of Prescott and Russell (UCPR) and will include an abattoir, cold storage, processing (of food by-products), production of ready-to-eat foods, marketing, and distribution services for meats, fruits and vegetables (figure one). It will primarily serve small to medium-sized farms in Eastern Ontario and Western Quebec. The project is budgeted at $36 million; the county has committed to $2.5 million, provincial and federal grants are expected to contribute $12 million, and the remaining $21.5 million will be covered by private investors. The UCPR will be a majority shareholder in the project. The food hub is set to be operational by fall 2022, with the township of Alfred having been identified as a promising location for the facility. Projections indicate that the food hub could see $11.4 million in sales in its first year.

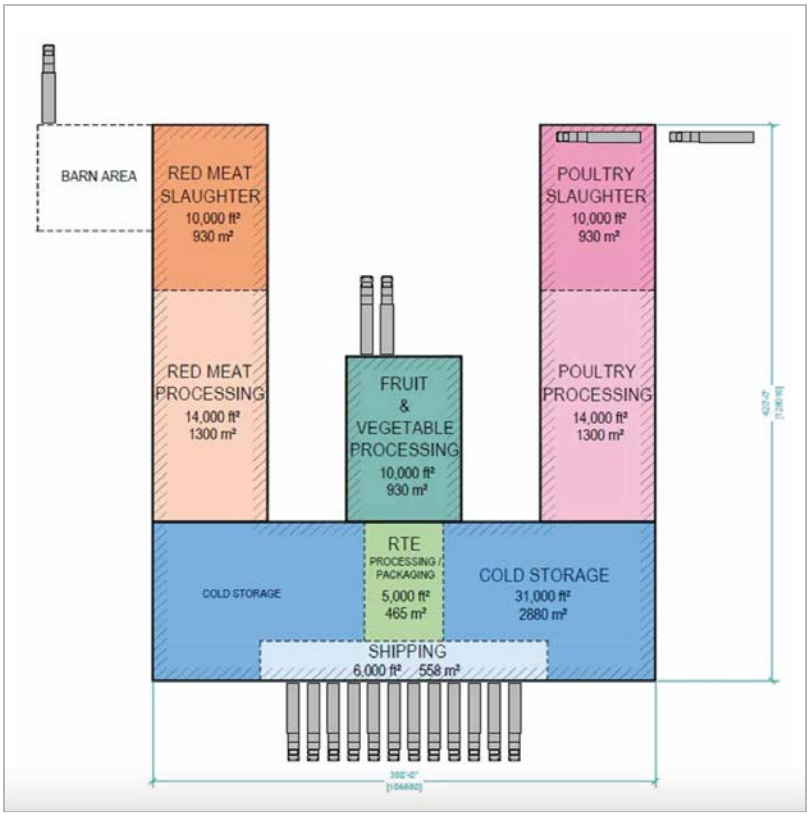

Figure one: a diagram of the proposed food hub.

Source: https://ontarioeast.ca/sites/default/files//UCPR%20Food%20Hub%20Plan.pdf

Two Rivers Food Hub

Two Rivers Food Hub, opened in December 2014, is located in Smiths Falls. Funding for this project was secured from an array of groups and individuals, including Trillium, OMAFRA, the Eastern Ontario Development Program, county-level and municipal government, the Greenbelt Fund, and the Collaborative Economic Development Program. The food hub's Board of Directors includes the Executive Director of Rideau Community Health Services, the elected Warden of Lanark County, a financial services expert, the Executive Director of ecoPerth (community-based greenhouse gas reduction group), and local producers. To support small and medium-sized farmers in the counties of Lanark and Leeds-Grenville, the facility offers commercial kitchen rentals, processing, and storage. Aside from brick-and-mortar operations, the food hub hosts an online platform to give buyers access to local products. Initially, they offered distribution services as well, but this aspect of the food hub ceased operations in 2018 due to limited investor support, lack of conventional financing, and lower-than-expected sales. The most recent data available indicates sales of $2 million in 2016, one year after beginning operations. Overall, they have serviced upwards of 35 clients.

Appalachian Centre for Economic Networks (ACEnet)

ACEnet is a community-based economic development organization covering the 32 Appalachian counties of Ohio. ACEnet employs ten staff members and is governed by eight board members including a private attorney, a workforce development professional, as well as local entrepreneurs and food experts. Currently, ACEnet offers technical assistance to business owners, processing, aggregation, distribution, production, packaging, labelling, and marketing capacity for food entrepreneurs, as well office space for small businesses. It also brings together entrepreneurs in networks to facilitate innovation sharing. Its support services for the food sector are housed in three separate facilities - the Food Ventures Centre in Athens, Ohio (where the commercial kitchen is located), as well as the Food Hub (distribution) and Food and Farm Enterprise Centre (processing), both located in Nelsonville, Ohio. Though primarily a brick-and-mortar operation, ACEnet offers online resources including contacts for start-up assistance. ACEnet has also partnered in local food initiatives like the Appalachia Accessible Food Network, the Central Appalachia Food Corridor, and a variety of farmers markets. Just last year, they launched a pilot program designed to determine whether or not mobile meat slaughter and small-scale processing in the region is feasible. There is an intake fee for all ACEnet clients of $50. The program is funded primarily by incubation fees (65%), with the rest contributed through federal, state, and foundation grants from 21 supporting bodies. ACEnet delivers its programming in partnership with 32 public and private organizations.

Astoria Food Hub

The Astoria Food Hub is located in Astoria, Oregon. It has a dual social and economic purpose, looking to enhance food infrastructure, while attempting to transform the regional food system in an equitable and ecological manner. The Food Hub emerged out of the need to increase storage, production, and aggregation capacity for local producers. It will be housed in a 27,000 square foot heritage building in downtown Astoria. It will offer an array

of services, including "...onsite cold and dry storage, a commercial kitchen, distribution resources, restaurants, a retail storefront, and support resources for regional food producers." (from the website). These services will allow local producers to access wholesale as well as consumer buyers. It will also include an educational function, with a non-commercial kitchen designed to enhance community members' knowledge of food and nutrition. The core team behind the Food Hub is comprised of local producers and business experts. The Food Hub will include a digital component alongside its brick-and-mortar services; an online store featuring local producers will soon be launched. So far, 33 producers have partnered with the Food Hub. Construction is not yet complete but the Food Hub recently hosted a successful Winter Market promoting some of these partners. The $700,000 necessary to cover initial costs was raised through a crowdfunding platform; 164 investors contributing between $100 and $20,000 participated in this effort.

Food21

Food21 is located in Pittsburgh, Pennsylvania, but aims to serve the Western Atlantic Food Shed (figure two). Its central goal is to expand jobs and opportunities in the food economy in a sustainable fashion. Food21 is governed by ten board members, including academics, business executives, financial services professionals, local producers, and community activists. Additionally, 21 community members have partnered with Food21 in an advisory capacity. Food21 is centered around three key services - a value centre, an insights centre, and an enterprise centre. The value centre offers feasibility planning, market analysis, business planning, stakeholder assessment, financing, coordination, and implementation for those looking to invest in a local food value chain. The insights centre "...is an online information service that combines, analyzes, and displays food economy data...", offering custom analysis, strategic planning, feasibility planning, a Food Abundance Index, economic modeling, and data integration reporting. Finally, the enterprise centre is focused on assisting food start-ups; it works with an existing food business accelerator and connects different food entrepreneurs, offering feasibility planning, market analysis, business planning, competitive analysis, financing, and coaching. It looks as though the bulk of these services are virtual. Information about the business model and funding mechanisms underlying Food21 was not readily available.

Figure two: the Western Atlantic Food Shed.

Source: https://www.food21.org/about-food21

Catalyst137

Catalyst137 is a 465,000 square foot hub located in Kitchener for entrepreneurs across a range of sectors. The space, a former warehouse, was acquired in 2016 and subsequently underwent significant redevelopment. The facility is currently owned and operated by its co-founders (one of whom owns a business that anchors the hub), as well as a director of building operations and a property manager. Tenants include three start-ups, nine companies looking to scale up, and three well-established enterprises. Catalyst137 has partnered with ten banks, investors, and innovators to allow entrepreneurs access to on-site funding and know-how. It hosts office space and co-working facilities, and includes a restaurant, coffee shop, and gym. Renovating the space cost $55 million and was financed by a local developer and real estate firm. The bulk of the facility has been leased and its co-founders have described the project as a major success.

Athens Locally Grown

Athens Locally Grown brought together nearly one hundred small-scale producers in Athens, Georgia, enabling them to have greater access to consumers as well as restaurants and grocery stores in the region. After 20 years, it closed last year, but before ceasing operations served some 4000 people in the community. Locally Grown was founded and owned by farmers. It was structured so that members had to pay a one-time fee to access to products on offer; they could then access an online store to select the produce they wanted and pick up their orders shortly after. Thus, Locally Grown was primarily a virtual operation but aggregated local food for pick-up purposes.

The Grove

The Grove is an agri-business hub located in London, Ontario. 5,000 square feet of the space is available as incubation space, featuring shared production equipment, packaging and storage. 95,000 square feet is dedicated to acceleration, with office and meeting space as well as opportunities for business-to-business collaboration. It was designed to connect entrepreneurs, facilitate innovation solutions, foster a community based on food, and educate. Currently, the Grove leases space to five agri-business tenants. It hosts a digital platform, Grove 365, which features a number of videos and other resources on agri-food, agricultural shows, recipes, and urban agriculture. Grove 365 also features an interactive agri-food experience meant to educate school-age children on how locally-produced food is produced, transformed, distributed, sold, and consumed. The Grove has also partnered with RH Accelerator to funnel early-stage food entrepreneurs through a 12-month accelerator program, offering "...a milestone-based business planning process combined with one-on-one mentorship and founder-peer learning that results in faster growth and higher probability of success." (from website). Additionally, the Grove partnered with Libra Credit Union to incorporate existing food incubation programs offered by the Small Business Centre and the London Economic Development Corporation. The facility also features a worm farm which transforms compostable green waste into fertilizer. In terms of funding, the facility received federal support through the Federal Economic Development Agency for Southern Ontario, although the Grove also hosts an online store selling things like tasting kits. Aside from the ones already mentioned, the Grove has partnered with several organizations, including Fanshawe, Western University, and the London Training Centre.

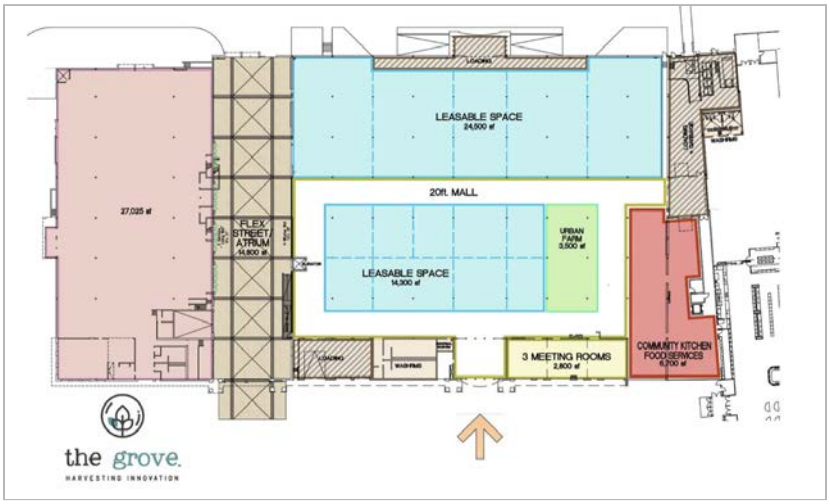

Figure three: a diagram of the facility.

Source: https://www.thegrovewfd.com/lease-space

DFO Innovation Program

The DFO Innovation Program is split into two streams, the Start-Up and Scale-Up programs. Start-up dairy processors are eligible to participate in the Start-Up stream, where they can access mentoring from specialists in areas like business planning, engineering, and equipment. At the end of this program, participants should have sketched out a business plan, at which they can hopefully access financing and thus become eligible for participation in the Scale-Up stream. In this program, participants have access to further mentoring and can receive up to $10,000 in grants from DFO provided that they submit expenses. Additionally, technical assistance is available in the form of online resources featured on DFO's website. The program was conceived of and is delivered and managed by Pollinate Networks Inc. Since 2017, more than 70 participants have moved through these streams. To date, the program has served to establish some 445 relationships between entrepreneurs, experts, and other stakeholders. With respect to funding, a grant was recently obtained from OMAFRA allowing the program to expand mentoring and offer more resources, including webinars, surveys, and access to experts.

Gwillimdale Farms

Gwillimdale Farms is located on a one thousand-acre property in Bradford, Ontario. The farm grows carrots, potatoes, beets, onions, parsnips, and other products based on seasonal availability. They also wash, pack, and ship their produce using farm-owned transport trucks. The farm practices sustainable agriculture, including "...natural compost and strict crop rotation to prevent pest issues and soil nutrient depletion." (from the website). Additionally, they use energy-efficient lighting and storage systems, and are working with the Ontario Produce Marketing Association to reduce food waste. Growing demand has forced the farm to double its packing capacity. Additional operational improvements are planned for 2022, including fully-automated potato grading and a potato line driven by artificial intelligence. Their produce is sold at a variety of major as well as independent retailers; the farm does not offer direct-to-consumer sales. Their online presence includes a recipes section.

Highlands East Food Hub

Highlands East Food Hub (located in Wilberforce, Ontario) grew out of an initiative to increase the storage capacity of the former Wilberforce Food Bank. The upgraded facility "...serves as a regional food hub for the eastern part of Haliburton County and shares food donations with surrounding food banks and programs in Haliburton County, Hastings County and beyond..." (from the website). The food hub in turn sources bulk donations from Feed Ontario, Kawartha Food Share and Kawartha Lake Food Source. The food stored at this food hub is used in four ways - it is provided to those who use the Cardiff and Wilberforce food banks, shared with other food organizations and food banks (in case of surpluses), and used for meal preparation at the food hub. The central rationale behind the food hub was that food banks are typically unable to accommodate bulk donations due to limited storage space. The food hub also has an educational function, featuring a program called Community Cooks. It also works in partnership with Feed Ontario (discussed in more detail below). In terms of funding, the food hub received an $141,000 investment from the

Ontario Trillium Foundation, supporting the construction of additional storage space on top of the existing food bank infrastructure.

Feed Ontario

Feed Ontario is a registered charitable organization working to achieve poverty and hunger reduction by bringing together food banks, food businesses, and community stakeholders in Ontario. They provide food banks in the province with a variety of food products year-round, they give food banks the resources they need to expand community food programming, and they research and advocate for policy solutions designed to cut back on food insecurity and poverty. To supply food banks, Feed Ontario runs seven programs, working with organizations like Dairy Farmers of Ontario and Chicken Farmers of Ontario, as well as retailers like Metro to give food banks greater access to a wider variety of food products. They also administer three community programs to enhance food bank activities. The Farm to Food program takes advantage of the commercial kitchen at Windsor's food bank to transform unsold produce into healthy meals. The Rural Kids program supports rural food banks, funding and administering outreach programs aimed at children in rural communities. The Feeding Possibility program offers financial support to food banks that are looking to improve their organizational capacity and better serve their community. Their use of Link2Feed data collection software enables them to track food bank usage in real-time, complementing research efforts which have produced nine reports on a variety of a food and poverty-related topics since September 2019. Ultimately, the organization believes that emergency food provision is only a band-aid solution, and as such, advocates for policies like improved social assistance, affordable housing, and better support for workers which might enable food insecure individuals to escape poverty. Organization activities are delivered and supported by an 11-person team of staff, and a 15-person Board of Directors which includes representatives from emergency food organizations, financial institutions, food producers, and other food businesses. With respect to funding, Charity Intelligence Canada reports that Feed Ontario posted $1.4 million in revenue from donations and special events in 2019.

Puget Sound Food Hub

The Puget Sound Food Hub is a farmer-owned cooperative that sources, aggregates, and distributes locally-produced food "...to restaurants, hospitals, preschools, grocery stores, [and] universities..." (from the website). This locally-produced food comes from 84 nearby farms which have joined with the food hub. Even at the point of aggregation, food hub staff work carefully to ensure that individual producers are advertised to buyers. However, individuals are not permitted to purchase products from the food hub - it only works with institutional buyers. Farmers are responsible for setting prices and ultimately own their products even as they move through the supply chain. Producers must meet a set of safety and quality standards to participate in the food hub. Most producers involved in the food hub are mixed vegetable farms. The food hub is very much a values-based organization, adhering to principles like sustainability, safe working conditions, health and nutrition, and animal welfare. As a cooperative, it is also committed to open membership, workplace democracy, autonomy, education and training, and community involvement. Prospective members are thus highly encouraged to ensure that they align with the organization's

values and principles. In terms of funding, the food hub was launched with the support of the USDA Rural Development Program, although its activities are supported year-to-year with one-time payments of $250 for farmers looking to join the food hub and annual payments of $100 for members and $150 for vendors. They also work with a variety of partners, including the Northwest Agriculture Business Centre, the Whatcom Community Foundation, and the Cloud Mountain Farm Center. In terms of governance, the food hub is supervised by a board of directors (comprised entirely of family farmers) and various committees, including a marketing committee, operations committee, membership committee, and finance committee. According to the website, purchasing local products from the food hub works as follows - "Buyers may order from multiple farms, compare products, and read farmer profiles including *Who*, *How*, and *Where* the food is produced…". Farms that have received orders then pack and deliver their food to two aggregation points (a warehouse and drop site which offer non-refrigerated as well as cold storage), at which point the food hub manages customer pick-up/delivery. The food hub also provides marketing support to help producers reach a greater number of potential customers.

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Initial Consultation Summary: Phase 1

Introduction

Interviews of participants in the Guelph Wellington food system were conducted by invitation over Summer 2021. This targeted stakeholder outreach offers an initial scan of the needs and wants within the regional food ecosystem. Each respondent shared their perspective on the strengths and weaknesses of the regional food system, and their sense of potential activities that a regional food hub might undertake to overcome perceived gaps.

Each interview participant was inspiring, demonstrating vision, persistence, and fortitude. All managed to overcome obstacles blocking their forward progress through determination, networking, and dogged problem-solving skills. If these individuals are representative of the Guelph Wellington food system, then we are working from a solid foundation and the real task in further strengthening the regional food system is to tap into the energy, passion and hope that already exists.

The combination of our consolidated findings and consultations provides a broad brush of the landscape related to food hubs, with the latter more specifically reflecting stakeholder expectations with respect to possible food hub implementation generally, and what aspects of a food hub would most benefit specific participants within the Guelph Wellington food system.

Food Hub Categorization

The responses from interviews on what might constitute worthwhile activities in a Guelph Wellington food hub tend to coalesce into three categories (which also align more or less with our consolidated findings regarding adopted food hub models). The vision presented by each of the participants reflects their experiences and contributions to the regional food system, and their sense of where a food hub might best overcome perceived gaps for individuals in similar positions.

The three visions for a food hub that emerge from the Guelph Wellington stakeholder consultations are:

1. enhancing the local food ecosystem infrastructure (both hard and soft assets),
2. offering business supports to emerging food entrepreneurs, and
3. promoting food system transformation.

The details of these three visions are outlined further below.

1. Local Food Ecosystem Infrastructure

a) Focus
- Championing and promoting the production and consumption of local foods.

b) Vision
- A central location (i.e., within or close to Guelph — e.g., Elora) with connected warehouse facilities — spokes — across the County to better connect local producers with the urban market, especially consumers interested in buying local.

c) Venue Type
- Commercial-oriented, expansive brick-and-mortar facility.
- Several food warehouse/storage sites in County to accommodate delivery to urban-based food hub and urban customers (especially in support of online farm sales).

d) Activities
- Aggregation: bulk buying of foods; warehouse, cold storage, and freezer; and co-packaging, co-delivery of goods.
- Distribution: pickup, offload/on-load, packaging, delivery.
- Platform for coordinated marketing and sales.
- Start-up support for local food entrepreneurs — e.g., commercial kitchen, R&D/simulation capacity to support innovation and scale-up, guidance.
- Capacity enhancement: e.g., grain dryer, milling, abattoir, produce and meat processing, egg grading station.

e) Beneficiaries
- Primarily local producers, with ancillary benefit of increased access for consumers interested in purchasing local foods.

2. Centre for Food Entrepreneurs

f) Focus
- Offer one-window, full range support to local food business start-ups, as well as to existing small food businesses looking to scale-up.

g) Vision
- A dedicated centre to support local food businesses, and promote networking and formation of business partnerships.

h) Venue Type
- A Guelph-based facility, with virtual capacity for training programs, information exchange, and networking.

i) Activities
- Business training: courses, business guidance and mentorship.

- Start-up assistance, administration/distribution of start-up grants, guidance on potential funding sources.
- Collision space: networking; non-threatening space for resource, information and expertise exchange.
- Partnerships: promotion of connections/linkages between businesses, relevant university R&D, or outside/international sources of technical expertise.
- Commercial kitchen facility and guidance on product development.
- Warehouse and storage capacity.

j) Beneficiaries

- Local new and young food entrepreneurs, and small food businesses looking to expand market reach.

3. Community Centre for Food System Transformation

k) Focus

- Supporting innovations to transform the food economy around circularity priorities — i.e., sustainability, food security, promotion of local foods, social justice.
- Broad community focus on furthering a distinct community brand.

l) Vision

- Public facility with high community traffic generated by grocer, café, vertical and traditional garden space, and series of community events.
- Community buy-in to a unique establishment created under the banner of transforming the traditional food economy.

m) Venue Type

- A Guelph based facility, with virtual capacity as brain trust for circularity and social food system innovation and transformation.

n) Activities

- Education and outreach.
- Aggregation: bulk buying of foods, warehouse and storage, co-packaging and co-delivery of goods.
- Grocer and on-line store, on-site café, in-house vertical and backyard garden.
- Central coordination of food rescue operations.
- Commercial kitchen facility to develop products, and to provide cooking instructions/promote food literacy.
- Networking and relationship building hub for innovators and community social service/health organizations; facilitating partnerships.
- Host community events: community dinner nights, food festivals, conferences, etc.
- Headquarters or offices for social programs - e.g., local foods promotion, school food literacy programs.

o) Beneficiaries

- Food innovators and progressive thought leaders promoting the transformation of food business operations and structures to embrace principles of circularity.
- Community social service programs offering assistance to newcomers to the region, new immigrants to Canada, and community members suffering from food insecurity.
- Local producers and local food entrepreneurs who ascribe and align with vision regarding social justice and circularity priorities.

What We Heard

Based on the consultations to date, responding stakeholders articulated a range of gaps/weaknesses in the regional food system. All may deserve attention, but not all can be addressed singularly, immediately or at once. Choices will need to be made against reasonable expectations, timelines and sustainability.

Below are some take-aways given what we have heard so far:

- There is not one type of food hub that satisfies the varied needs and wants of all the responding participants in the Guelph Wellington regional food system.
- Circularity as a theme is not a prominent feature amongst stakeholders. Purposeful prodding did reveal elements of circularity already existing in successful business models — i.e., seeking efficiencies and cost reductions in inputs/outputs, re-usage or re-purposing of waste, community-minded contributions to alleviate food insecurity, etc.
- Three distinct categories of food hubs emerged through the consultations, based upon vision, focus of activities, and intended beneficiaries.
- Somewhat surprisingly, these three emerging visions of what an ideal regional food hub might entail are mutually exclusive, although there are common activities or capacities envisioned within each.
- The defining feature delineating each food hub concept is the intended participants[31], or those stakeholders who would most benefit from a particular type of facility. This is conceptualized below.

Vision	Participants
1. Enhancing the local food ecosystem infrastructure	• focused on supporting local producers.
2. Offering business supports to emerging food entrepreneurs	• focused on supporting emerging and expanding small-to-medium food businesses.
3. Promoting food system transformation	• focused on supporting a limited subsection of the above, as well as social service organizations, all aligned and drawn together by circularity, food insecurity, and sustainability principles.

[31] It was emphasized on several occasions by responding food entrepreneurs that commercial-based enterprises found it difficult to work competitively and sustainably in a space dominated by organizations whose business models were not commercially structured or profit-oriented.

The emergence of these three visions for a food hub speaks to the need for hard decisions to be made down the road regarding purpose, priorities, and intended beneficiaries to clearly define what food hub type(s) best match the needs and available public/private resources of the Guelph Wellington community. In the end, the direction chosen may involve one, a combination of one or the other, or all three — regardless of the decision, the strategy and timing on how to get there will be critical.

The following stages of this study will look at establishing greater detail from a broader range of regional stakeholders on what we heard so far, and conducting analysis regarding the parameters for sustainability or feasibility of each of the three regional food hub visions identified above.

Addendum to Post-Consultation Report: Feedback Details

1. Farmers/Producer Associations

- Need to aggregate distribution and storage resources — i.e., refrigerated trailer, cooler/freezer space) — to lower individual costs and help farm operations (especially those dependent on on-line sales) reach urban markets.
- Need a central location to develop partnerships with like-minded, innovative producers and local food businesses to consolidate sales/marketing efforts, especially for local meats, fruits and vegetables.
- Prioritize local production and small-scale infrastructure, especially by addressing regional production pinch points — e.g., access to egg grading, oat processing (which is scarce in Ontario) to produce oat milk, slaughter/butchering capacities, meat and vegetable processing, milling. Ontario Agri-Food Venture Centre in Northumberland is a good model.
- Restore and coordinate farmer access to research and advancements in tech knowledge and equipment — OMAFRA cut back in outreach services has diminished this resource.
- As a commercial-based business, it is difficult to work competitively and sustainably in a space dominated by organizations whose business models are not commercially structured or profit-oriented. Producers need fair market value for goods to be sustainable.
- Farming is an inherently circular operation — e.g., reducing or reusing waste, constantly looking for efficiencies in operations, placing a premium on local production and local goods, addressing food insecurity and nutrition.

2. Urban Farmers/Food Entrepreneurs

- Need central space to share existing technical expertise or where to source that expertise — e.g., catalogue of input suppliers, application of new technologies.

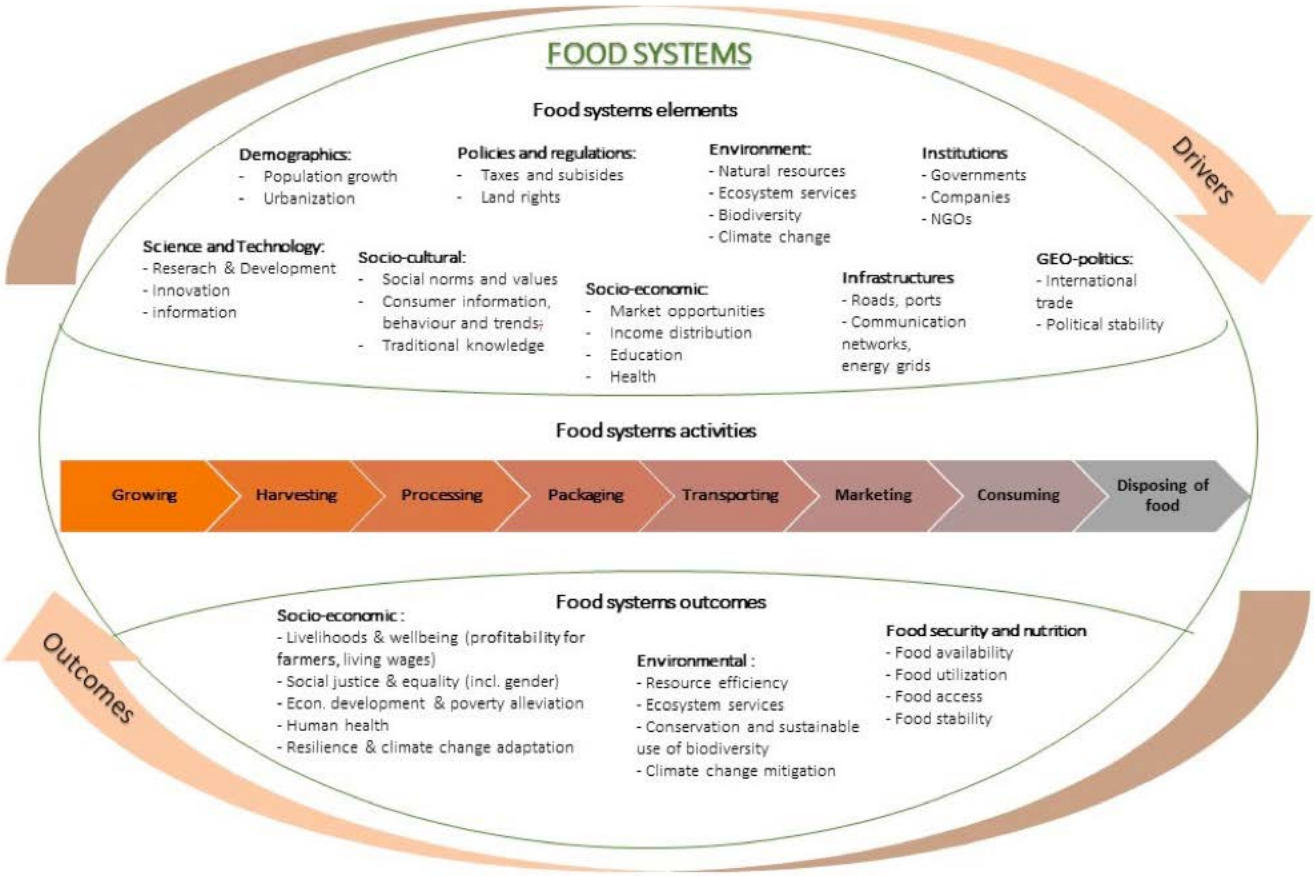
This would also help to connect and form necessary partnerships with research entities — i.e., UofG, Conestoga College, Vineland, international institutions, etc.

- Would be helpful to have a dedicated agro-tech oriented collision space, offering small business and young entrepreneur start-up and mentoring assistance, incubator support, and guidance on where/how to source funding. Guelph needs a non-competitive space that promotes resource and information exchange — better coordination of resources like Innovation Guelph, University of Waterloo Entrepreneur Futures Program, etc.
- Central networking facility would help in developing or sourcing relevant training material — both business education and technical training.
- Since the pandemic, seeing growth in the customer base interested in fresh, local goods, environmentally friendly production and packaging methods. This should be a focus.

3. Social Service Organizations

- Food hubs would allow for aggregation — i.e., bulk buying and storage, transportation and delivery infrastructure — to help reduce and stabilize purchasing and warehousing costs, address storage of perishables.
- Need a central location to promote networking, coordination and sharing of resources for organizations that are struggling to source goods at a stable, affordable cost.
- Centrally located, buzzing, vibrant public-facing facility under transformation banner: community-building focus, help welcome newcomers and immigrants, host events (community meals), include on-site farmers' market and/or grocer, on-site café, garden space — bringing local farmers, food agencies and community together.
- Include expansive commercial kitchen space for food preparation, and also for community cooking/food awareness classes.
- Need vision that builds excitement, unique/transformative in mission, and attracts community buy-in.

Attachment I: Conceptualizing a Food System



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Second Consultation Summary - Phase 2: Consultations Report Back

Context

MK&A Consulting and Pollinate conducted a second round of consultations in late 2021/early 2022 as part of a feasibility study on the establishment of a food hub in the City of Guelph/County of Wellington region.

These follow-up consultations cast a wider net amongst stakeholders within the regional food ecosystem, seeking feedback on an early consensus vision for a Guelph Wellington food hub as a regional network connecting a community of interests in local foods, underscored by circularity values and principles.

Respondents were asked about perspectives regarding prospective priority activities, risks, and governance/financing that would offer the food hub project the greatest chance of success and longevity. Specifically, respondents were asked to weigh-in on issues of sustainability and long-term viability.

Response Themes

Overall the reaction to the suggested direction for this initiative was very positive. Below are the key themes in responses provided in the second tranche of consultations.

Reaction to Regional Food Hub Vision

- Community-based: any initiative needs to ensure broad buy-in from local producers and the community — i.e., it should not be a top-down effort, but rather responsive to a "pull" coming from the community.
    - it will be important to develop a strong network of like-minded and committed stakeholders with a common vision.
- Implementation: early operations should be nimble and adaptable, perhaps focusing on repurposing existing assets as opposed to establishing a brick-and-mortar footprint. Early focus of the project could be around connecting local needs with existing and available resources — helping to organize logistics and connect to available infrastructure (e.g., funding sources, business support programs, warehouse and cold storage space, commercial kitchen space, distribution infrastructure, etc.)
    - examples of existing assets would be 10C commercial kitchen, Guelph Farmers' Market facility, and City/County/Municipal entities currently dormant or under-utilized.

- Key activities: cost sharing and pooling resources to aggregate purchasing/procurement, storage, distribution; amalgamate marketing of local foods to offer consistency in supply and volume to local food retail; raise local food awareness.
    - community events, workshops and seminars would help to establish greater community involvement.
    - consider establishing concierge service for local food businesses, encouraging collaborations and partnerships.

Anticipated Cautions/Risks

- Staffing: the project will need dedicated, permanent staffing to ensure tangible benefits to users. The value-add of any inventory of existing resources on which referrals would be based, will be dependent on its relevance, depth of knowledge regarding the food ecosystem, and assurance that it is constantly being updated.
    - At the outset, there will likely be heavy reliance on the interpersonal skills and passion of its leadership to champion the project, and establish the necessary networks, social capital and trust within the community.
- Commercial vs Nor-For-Profit orientation: 'for-profit' respondents expressed a willingness to partner with not-for-profit organizations, but suggested that the project must be business-oriented to be sustainable. Local small producer involvement can only occur in a fair market setting (not discounted sales) given the tight margins of small farm operations.
- Start small and nimble: the initial phase should be modest, flexible, and focused on strengths — complexity can be added over time based on successes and momentum achieved. Investing too early in infrastructure can make the project overly rigid.
    - The benefits to participants must be tangible and realized early — need to develop critical mass and momentum to sustain interest in participation.
    - Negative experiences at the outset will turn participants away; there must be tangible benefits to working through the Food Hub or prospective participants will seek out their own solutions.
    - The Food Hub must be flexible enough to evolve and adapt to ever-changing circumstances.
- Pick a lane: establish clearly defined goals, and adopt a collaborative community approach so as not to compete with existing local programming or organizations. Do not look to recreate business support or innovation/incubator programs.

- Clarify a common set of values to help define direction, participation and objectives.

- Risk existing organizations viewing the Food Hub as competition and forcing them to relinquish control of areas in which they are heavily invested.

Governance/Funding

- Representation: local farmers need to be involved in the strategic direction and decision-making. Farm groups are not good substitutes for individual small producers, since group representatives are too removed from the intricacies of farm business operations (i.e., more focused on policy) and tend to be the voice of large, established operations (as opposed to progressive, artisanal farmers).

- Initial funding: core funding (especially for implementation) would need to come from the government. Stable, core funding will likely be necessary for the first 3-5 years, with anticipation that operations will proceed initially at a loss.

- Ongoing funding models: the project could consider modest membership fees for local farmers, food shares or crowd-sourcing, and/or be service oriented and structured as a not-for-profit — i.e., funding various local food initiatives on a project-by-project basis, partnering with other local organization where appropriate (akin to the 10C model).

Long-term Success

- Reinforcing the regional food ecosystem: sustainability will be dependent on the impact made in the community, with loyalty generated by a demonstration of trustworthiness and value-add.

    - "Success" is seen as the establishment of a community hub around a common set of values, shared need and (where successful) in increasing the profitability and sustainability of participating businesses and organizations.

- Increased profit margins for participants: strengthen the connectivity between local producers and consumers, broaden the demand and market for local foods, strengthen local food entrepreneur margins through increased uptake and marketing of local/regional brands, and increase access to local foods within the community.

    - "Success" is seen as arriving at a sustainable balance between commercial interests and social values that are important to the community.

Conclusion

The themes offered by regional respondents correspond with our research on elements favouring the sustainability and longevity of a regional food hub project:

- be realistic about the initial phase — don't overreach;
- be clear regarding vision and objectives;
- while initial operations are unlikely to be profitable, the project should be built on strong business principles with funding self-sustainability as a medium-term objective;
- establishing a strong connectivity to the community, including an acute understanding of community need/demand, is vital to sustainability;
- prioritize delivering on tangible benefits for local producers and food entrepreneurs to help reinforce the local food infrastructure and promote access to local foods.

Circularity principles underlie much of the objectives being sought in the focus on local foods, without being explicitly stated. Farm businesses and food entrepreneurs are constantly looking for strategies to minimize costs and enhance the value of their goods. Promoting local sourcing, environmentally conscientious practices, waste reduction and repurposing, seeking equitability in access, and addressing community food poverty — these are all principles which were either tangentially or directly referenced in our conversations with respondents.

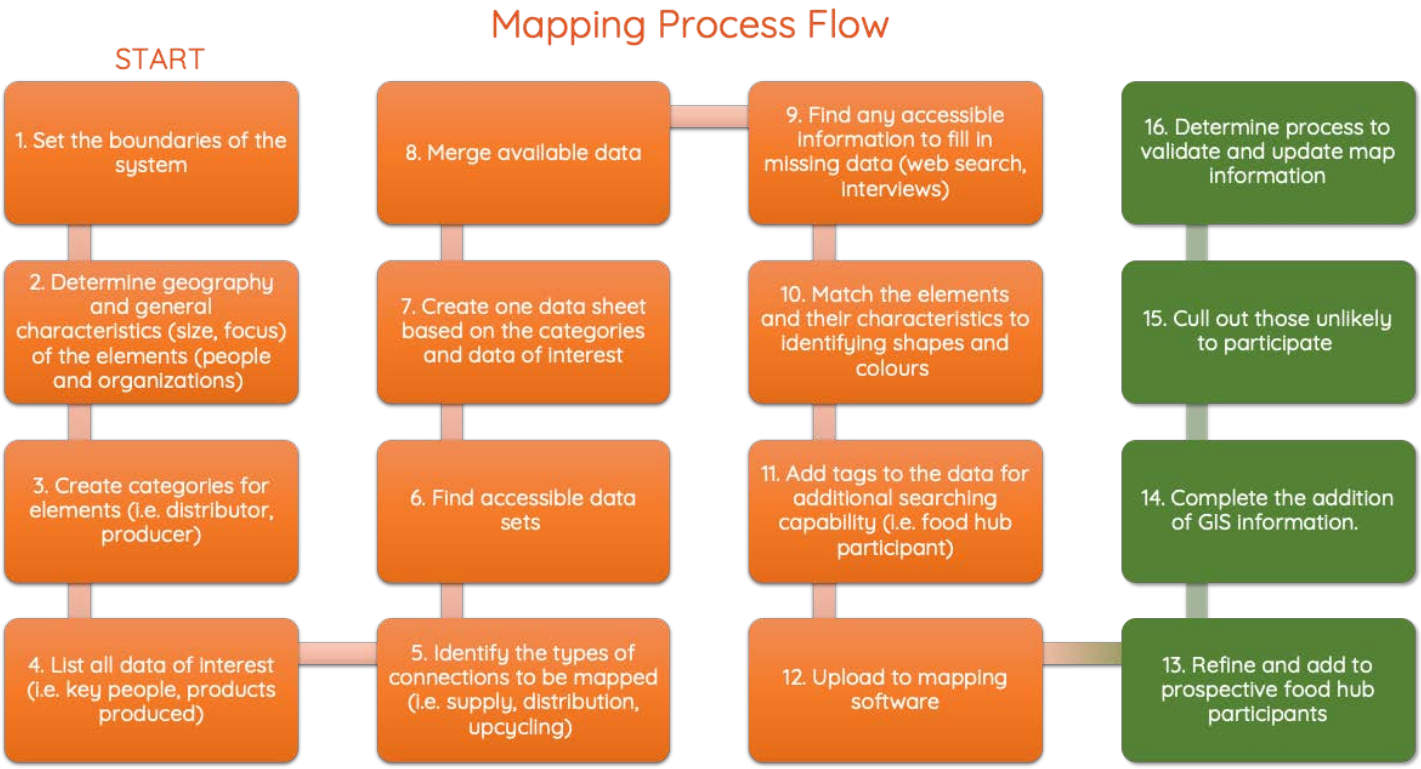
The other common noteworthy feature that was evident in all our conversations: responding community stakeholders are strongly enthusiastic about the prospect of a food hub being established in the Guelph Wellington region. The community interest is there.

Food Hub Ecosystem Mapping

What We Did - Mapping Steps

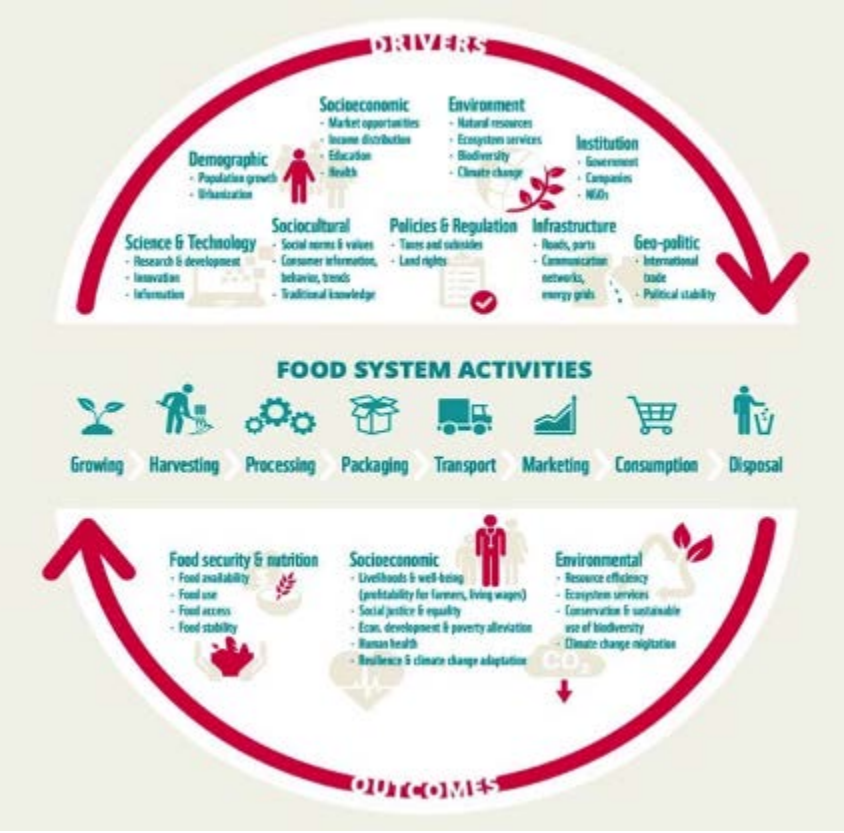
Mapping the potential ecosystem for a local food hub in Guelph Wellington involved looking for data on the existing players. Firm level data from the province is generally from 2017 and does not take into consideration the changes since 2019. The data collection exercise points to the need for better data collection and maintenance for economic and circularity development purposes.

Steps we used to map the data are itemized below.



Steps 1 and 2: Determine the boundaries of the system being mapped

To populate a data source for the group of players immediately relevant for a local food hub, we start with a sense of the system the food hub will be operating in. The ecosystem diagram in this case is the model of the food system - we are looking to create a food hub that increases the health of this system, by taking a discrete role in getting more local food to market within it.



Steps 3-6: Amalgamate a beginning data set

Based on information given, we were able to map a first set of connections that have players from all areas of the ecosystem. Data and introductions were provided by Our Food Future Datahub and the County of Wellington Taste Real program as well as core team members from Smart Cities, COIL, and NGen.

The 4 data sets we built the first layer of connection from were as follows:

- Seeding Our Food Future (iHub intakes)
- ARC-GIS data
- Additional Taste Real data
- Consultation list provided by core project team members

Steps 7 and 8: Create labels, shapes, and categories for the map

Labels, connection categories and searchable tags were created for the elements being mapped. Labels include:

- Church
- Circularity Resource
- Consultant
- Distributor
- Government/Institution
- Incubator
- Market
- Network/Association
- Prepared/Processed Foods
- Producer
- Restaurant/Catering
- Retail
- Social Program/Enterprise
- Think Tank
- Upcycler
- Other

Connection categories include:

- Collaborator
- Contributor
- Education
- Supplier
- Upcycler
- Vendor

Searchable tags include:

- Local Food Hub participants
- Circular food entrepreneurs
- Food Transformation players

Some organizations may have more than one “tag”.

Select visualization strategy

Web-based sharable software was selected (kumu) to enable the team to share visualizations of the resulting map. This format enables transferable ownership of the base information sheet (currently with Pollinate). Other mapping software could be used with basic alterations to the data.

Steps 9 and 10: Fill out data for the map

Web-based research was conducted to verify the list of people and organizations and refine the elements into categories. Locations were added for half of the players on the map (due to the mapping software nomenclature, players are also called elements).

Step 11: Gather additional data from key city and county staff

Consultation with county and city staff enabled us to draw more connections by providing additional groups of players and connections. Additional key resources were also added to the map, appropriately supporting the food hub supports and activities..

Next steps and potential for maps

Next steps for this data and potential long term goals were discussed with city and county resources with regard to future possibilities for the mapping information. These conversations are detailed in the “Using the Maps” section below.

This initial data set is not appropriate for public sharing. Opt-ins needed from participants as connection data is gathered.

What We Saw

As a great deal of the effort for this initial mapping was getting a data set that had an accurate picture of the players across the region, and some beginning information on who they are connected to, we can assume that information is missing. However, as an initial dataset, it provides an initial listing and some insight into players in the ecosystem and their connections.

Type	Grand Total	Local Food Hub	Circular Food Entrepreneurs Centre	Food Systems Transformation
Church	2	2		
Circularity Resource	5		1	6
Consultant	13	2	5	8
Distributor	4	4		
Government/Institution	11	3	4	7
Incubator	5	4	3	3
Market	10	10		
Network/Association	6	1		5
Prepared/Processed Foods	82	82	21	
Producer	95	95	13	
Restaurant/Catering	15	15		
Retail	32	31	1	1
Social Program/Enterprise	19	2	1	19
Think Tank	6		1	5
Upcycler	4	3	4	
Other	3	2	1	1
Totals*:	**313**	**256**	**55**	**55**

Connect circularity resources to businesses

Connect businesses to social programs

Add upcycling players

Note the following from these statistics:

- Local markets have created central hubs for food players
- Taste Real data begins to explain who is working with who
- Need more distribution/sales outlets for local foods - as this may not be a comprehensive list of players, need to add all those that exist and re-evaluate
- Need to amplify interplay with social system
- Need more circular players and connections to circular resources - both those who become suppliers to other players (i.e. packaging) and those organizations who provide examples of “starting circular” and who are benefitting from green messaging

What Comes Next

The following are suggested next steps to make the best use of the map of the food hub ecosystem.

Refine and add to prospective food hub participants

Continue to add players to the community of interest - who has been missed? Beyond the data sources made available for the food hub feasibility study, are there other data sources that could be added?

Complete the addition of GIS information.

Of the 313 elements (groups mapped onto the ecosystem map) 132 of them have been geolocated to the map. As the groups are refined, having a sense of where players are geographically may be helpful.

Cull out those unlikely to participate

Put those who are in the system but not likely to participate in any aspect of a local food hub on a different map or list of initiatives.

Determine process to validate and update map information

The part of building the food hub means continuing to validate the information available through lists, the internet and consultation. Improvements to source data are required - there are many places where partial information exists on the food system players in Guelph Wellington, but none are up to date since changes in 2019. Continued efforts to ensure the existing data is up to date will be required.

Given existing initiatives, it makes sense to continue to evolve the food hub map and community of interest by gathering data while relationship building. An underlying condition of successful ecosystem play is to have the starting team gain appropriate familiarity and trust with and among the players. Trusting relationships already exist through programs Taste Real, Shop Guelph, and COIL. We suggest a collaborative outreach to food companies, either in due course when connections are already being made or as a special initiative. Specific needs assessment data to collect, based on mapping discussions would be as follows:

- Area of focus*
- Location*
- Current size and focus of operation
- Connections - existing and desired
- Business needs
- Areas of interest for growth, partnership, innovation
- Awareness of benefits of circularity and sustainability
- Certifications achieved/of interest

*Already gathered for existing maps.

Using the Ecosystem Maps to increase viability for the Local Food Hub and health for the ecosystem

Many supportive roles are already being played within the local food ecosystem in Guelph Wellington as the research above shows. Many of the needs expressed by food system actors (those who grow, make and sell food) can be further resolved by coordinated efforts and the introduction of a food hub data team to keep the needs assessment refreshed. Roles important for maintaining, advancement and using the food hub data are detailed in the grid below. Some roles are already being done in pieces at Our Food Futures, Tase Real and other programs.

Using the maps

Two components, maps and a data sheet or sheets that feed the map.

Four roles are needed to manage and use the maps:

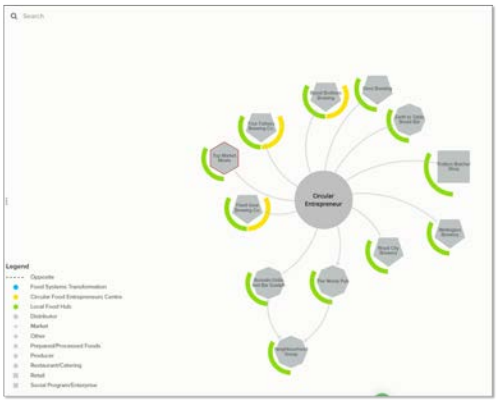
- Ecosystem Intelligence - maintains and improves the data and the visualization
- Wayfinding and Matchmaking - creates clarity on resources and provides introductions
- Targeted Communications - provides high value information based on needs and characteristics
- Initiative Design and Development - uses all information from the ecosystem to propose solutions to missing pieces

	Roles/Teams for Managing the Food Hub Ecosystem			
	Ecosystem Intelligence	**Wayfinding and Matchmaking**	**Targeted Communications**	**Initiative Design and Development**
How they use the maps and sheet(s)	The maps can be used as a visual directory of food hub and food systems players	Connect players on the maps to create opportunities	Demographic and needs assessment data from the sheet(s) can be used to target communications about ecosystem news and opportunities	Needs assessment data from the sheet(s) can be used to determine aggregate sets of needs that can be acted upon
Roles they play	Add additional players (elements) to the data sheet	Add to the connections between elements on the maps and in the data sheet(s)	Works with Ecosystem Intelligence and Wayfinders and Matchmakers to create channels to refine firm level	Activate programs based on shared needs of participants and resources in the ecosystem (i.e. marketing)

			and aggregate information	
	Improve the existing demographic data accuracy and add needs assessment data	Provide introductions to parties that might mutually benefit	Ensures channels are capturing feedback on what is working and not working in the ecosystem	Collect players with common needs to determine how to fill them (i.e. physical infrastructure)
	Increase the descriptiveness of the demographic data What products/services are offered	Look at larger collaborations based on opportunities and create collision opportunities		
	Evaluate new demographics and business information that can be added to the data sheets (certifications, programs)			

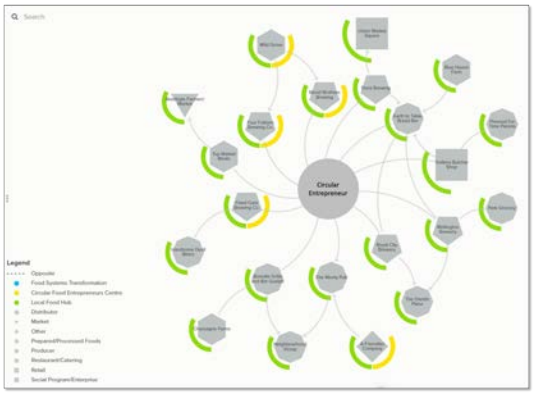
Use Cases

1. A new circular entrepreneur has applied to COIL with a promising new technology for dealing with food waste including potato and citrus peels, and fish and meat trimmings. The organization is looking for short and long term partnerships with organizations who are looking to ensure that these bioproducts are upcycled into usable nutrition.
    - In this use case, a decision would be made between the local food hub staff (could be Taste Real involvement) and the COIL representative as to whether the entrepreneur is ready to meet new partners.
    - If the entrepreneur is ready to move into partnership, the maps underpinning the local food hub would be used to identify a primary list of possible partners, who create the kind of waste the company is looking for.



	Ecosystem data capture and activation	Market access/ demand focus	Efficient logistics	Outreach, collaboration and partnerships	Outreach, education and change leadership	Talent capacity	Firm level support and services
Activities	Mapping	Demand aggregation	Transportation	Community engagement	Public policy research	Upskilling	Way-finding Leverage ag-tech cluster
	Data activation	Data activation	Data activation	Data activation	Data activation	Data activation	Data activation
	Matching	Curated collaboration	Distribution	Curated collaboration	leadership convening	Outreach	Curated collaboration
		Business innovation	Storage		Communications	Training and education	
		Supply chain problem solving	Logistics			Leadership development	

- The secondary contacts could also be introduced to see if there are food sources further up the supply chain.



- COIL resources, Ec dev resources

2. Another example of the type of analysis needed could be the need for some kind of shared meat processing for our local grass-fed producers. OMAFRA data tells us that Grass-fed livestock costs around 30% more to produce because of scale. It also depends upon local abattoirs – so even though Guelph is home to Better Beef, that is not a facility that small scale producers can get their livestock processed.
    - The business case should show if an adequate supply chain exists to support a shared resource
        - participants in small scale grass-fed beef production and others with similar needs - who and where are they
        - existing local abattoirs
        - marketing infrastructure like farmers markets and independent retailers/restaurants

	Ecosystem data capture and activation	Market access/ demand focus	Efficient logistics	Outreach, collaboration and partnerships	Outreach, education and change leadership	Talent capacity	Firm level support and services
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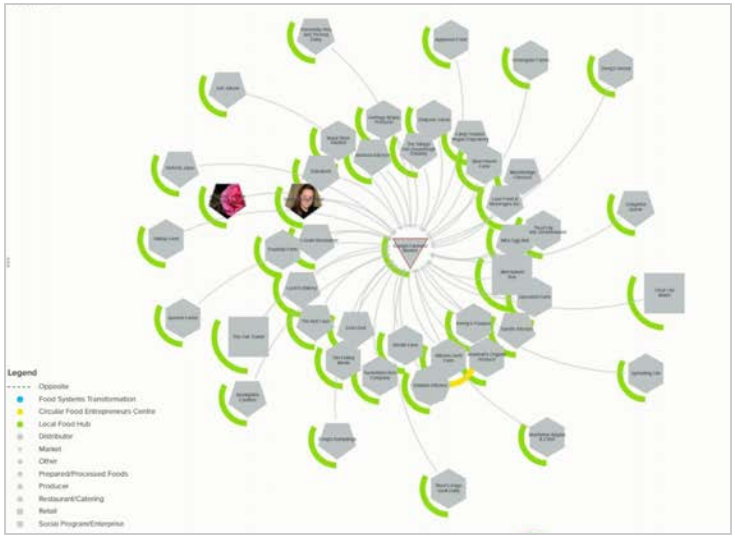

Conclusions

As of today, the maps are built for existing match makers and way finders. As the map and data set evolve, it may be that starting within the ecosystem beyond the regional and municipal stakeholders may become beneficial. It may be that ecosystem players opt for an intermediary handling data. Whatever the data use case, the timing and approach for creating an opt-in so the data can be shared more widely will need to be considered.

For the Guelph Wellington Food Hub feasibility project, the map of the ecosystem provides a place to start education and interventions to support organizations growing with circularity principles in mind. It is a needed visualization for match-makers and wayfinders already trying to navigate the system, and their immediate improvements will create the shared intelligence around connections that will enable seamless help to be provided to food systems players who are making and selling food, redistributing food and transforming local food systems to be more circular.

Glossary

– A –

Avoidable Food Loss & Waste: Food product that is designated to waste streams that could have been reasonably considered edible at some point in its lifespan in the food system. [1]

AgriStability Program: A margin-based program designed to help farmers deal with significant income declines. It provides up to $3 million when participants experience large declines in their net incomes due to production losses, cost increases, or market conditions. [2]

Acute Food Insecurity: Food insecurity found in a specified area at a specific point in time and of a severity that threatens lives or livelihoods, or both, regardless of the causes, context or duration. Acute food insecurity is relevant to providing strategic guidance to actions that focus on short-term objectives to prevent, mitigate or decrease severe food insecurity that threatens lives or livelihoods.[13]

Aeroponics: The growing of plants in a soilless environment where nutrients are intermittently or continuously misted on to the plant roots.[14]

Afforestation: Establishment of forest through planting and/ or deliberate seeding on land that, until then, was not classified as forest.[15]

Agroecology: Application of ecological science to the study, design, and management of sustainable agrosystems.[16]

Agroforestry: An agroforestry system is a form of multiple land use where woody perennials (trees, shrubs, bamboos, palm trees, woody lianas) are grown on the same land management unit with crops and/or animals.[17]

Anthropocene: Unofficial interval of geologic time, making up the third worldwide division of the Quaternary Period (2.6 million years ago to the present), characterized as the time in which the collective activities of human beings (Homo sapiens) began to substantially alter Earth's surface, atmosphere, oceans, and systems of nutrient cycling.[18]

– B –

Broadband: In comparison to dial-up that requires an internet connection to be made each time, broadband internet is always on and provides higher speeds than dial-up service.[4]

Business Risk Management Programs: A range of programs Ontario farmers rely on to manage and mitigate risks beyond their control, like weather, fluctuating costs, and market

prices.[5]

Biodynamic Farming/Agriculture: A view of agriculture based on a holistic and spiritual understanding of nature and humans' role in it, which considers a farm as a self-contained evolving organism, relying on home-produced feeds and manures with external inputs kept to a minimum.[19]

Biofuel: Biofuel is fuel produced directly or indirectly from biomass.[20]

Biodiversity (biological diversity): The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. Diversity indices are measures of richness (the number of species in a system); and to some extent, evenness (variances of species' local abundance). [3]

Biomass: Organic material both above-ground (stem, stump, branches, bark, seeds, foliage) and below-ground (roots), living or dead.[21]

Biosphere: That part of a planet — including air, land and water — in which life develops, and which life processes in turn transform.[22]

Breakthrough: A breakthrough is a discovery or disruption that causes significant, sometimes sudden or dramatic change of the trajectory of the future. Breakthroughs can be technological, social, political, cultural, economic, or a combination of these.[23]

– C –

CAD: Canadian Dollar [1]

CO_2eq: Carbon Dioxide Equivalents [1]

Collection: Activities involving the collection of food waste by public and private actors. [1]

Carbon Budget: The area under a greenhouse gas (GHG) emissions trajectory (i.e. the amount of carbon emissions) that satisfies assumptions about limits on cumulative emissions estimated to avoid a certain level of global mean surface temperature rise.[24]

Carbon Credit: A generic term for any tradable certificate or permit representing the right to emit one ton of carbon dioxide or carbon dioxide equivalent (CO2-e) [3]

Carbon Offset: Arrangements under which an electric utility, for example, could be authorized to build a new power plant, provided it compensates for the predicted increase in carbon emissions by planting a certain number of trees, by financing reduced-impact logging, enrichment planting, forest protection or reforestation in a developing country in order to sequester carbon and offset emissions (i.e., increase carbon fixation and reduce atmospheric carbon).[25]

Carbon Reservoir: A system which has the capacity to accumulate or release carbon.[26]

Carbon Sequestration: The process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. There are two major types of carbon sequestration: geologic and biologic.[27]

Carbon Stock: The absolute quantity of carbon held within a pool at a specified time. The units of measurement are mass.[28]

Cellulose: The principal constituent of plant cell walls accounting for about 30% of vegetable matter.[29]

Challenge: A challenge is the outcome of a set of issues, typically brought about by a number of causes or factors, and presents an opportunity for intervention.[30]

Chronic Food Insecurity: A situation that exists when people lack long-lasting secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life.[31]

Climate Change: Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external factors, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. The United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods". The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.[32]

Conservation: A series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favorable status.[33]

– D –

Distribution: Activities involving the transport, storage and wholesale of food products. [1]

Deforestation: The conversion of forest to other land use or the long-term or permanent loss of forest cover and transformation into another land use such as agriculture, pasture, water reservoirs and urban areas, which are usually considered more profitable.[34]

Desertification: Land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.[35]

– E –

End-of-Life: Activities involving the treatment and disposal of food waste. [1]

EOL: End-of-life [1]

Eq.: Equation [1]

Ecological Reserve: Ecological reserves are areas selected to preserve representative and special natural ecosystems, plant and animal species, features and phenomena. Scientific research and educational purposes are the principal uses of ecological reserves.[36]

Ecosystem: An organizational unit consisting of an aggregation of plants, animals (including humans) and microorganisms, along with non-living components of the environment.[37]

Endangered Species: Species threatened with extinction.[38]

Endemic Species / Indigenous Organism: An indigenous organism is an organism that is naturally occurring (i.e. has not been introduced by man) in a specific area. Indigenous organisms are sometimes called native.[39]

Environment: Prevailing conditions reflecting the combined influences of climate, soil, topography, and biology (other plants and animals) in an area. Environmental factors determine how well a particular species will grow in a given area.[40]

Erosion: The loss of surface soil due to water, wind, gravity and/ or human activities.[41]

Extreme Poverty: Refers to the percentage of people living on less than USD 1.90 a day (2011 PPP prices) in a country in a given year.[42]

– F –

FCM: Federation of Canadian Municipalities [1]

Food Loss: Refers to food that is intended for human consumption but, through poor functioning of the food production and supply system, is reduced in quantity or quality.[11] [12]

Food Waste: Refers to food for human consumption that is discarded (both edible and inedible parts) due to intentional behaviors. “Food waste” often refers to what occurs along the food chain from the retail store through to the point of intended consumption.[11] [12]

Fixed Wireless: Brings the internet signal to an individual’s residence through radio waves transmitted by a base station to a receiver in their home. Generally used in rural areas where establishing broadband infrastructure is expensive. [2]

Food Fraud: When food is purposefully misrepresented for economic gain.[6]

Food Insecurity: A situation in which there is a compromise in the quality or quantity of food that is consumed or a reduction in food intake and disrupted eating patterns.[7]

Food Miles: The distance that food takes to get from a farm to an individual's plate. [2]

Food Systems: The complex and interconnected web of actors and activities involving the production, processing, transportation, consumption, and disposal of food products.[8]

Food Loss: Decrease in quantity or quality of food.[43]

Food Security: A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four food security dimensions can be identified: food availability, economic and physical access to food, food utilization, and stability over time.[44]

Food Systems: The entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products. Food systems comprise all food products that originate from crop and livestock production, forestry, fisheries and aquaculture, as well as the broader economic, societal and natural environments in which these diverse production systems are embedded.[45]

Food Waste: Removal from the food supply chain of food which is fit for consumption, by choice, or which has been left to spoil or expire as a result of negligence by the actor – predominantly, but not exclusively the final consumer at household level.[46]

Forage: Edible parts of plants, other than separated grain, that can provide feed for grazing animals, or that can be harvested for feeding. Includes browse, herbage, and mast.[47]

Foreign Direct Investment: Refers to a category of investment where the objective is to establish a lasting interest by a resident enterprise in one economy (direct investor) in an enterprise (direct investment enterprise) that is resident in the economy of a different country than that of the direct investor. It implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise.[48]

Forestation: Establishment of a forest on an area, whether previously forested or not.[49]

Forest Degradation: The destruction of specific aspects of forests such as a decrease in tree cover, changes in their structure or a reduction in the number of species that can be found there, resulting in reduction of the capacity of a forest to provide goods and services.[50]

Forest Health: A generally observed, somewhat subjective condition whereby the forest is evaluated according to its age, growth, diversity, existence (or absence) of injurious insects, diseases, exotic invasive pests, wildlife attributes, aesthetics, degree of resiliency, etc., all of which are weighed against the land management goals.[51]

– G –

Grand Challenge: A set of complex and overlapping challenges that are commonly multi-dimensional; in that they contain social, technological, economic, environmental, and political dimensions. Grand challenges present both opportunities and obstacles for change.[52]

Greenhouse Gas Emissions (GHG): The discharge of greenhouse gases, such as carbon dioxide, methane, nitrous oxide and various halogenated hydrocarbons, into the atmosphere. Combustion of fossil fuels, agricultural activities and industrial processes contribute to the emissions of greenhouse gases.[53]

Genetic Engineering: Directed modification of the gene complement of a living organism by such techniques as altering the DNA, substituting genetic material by means of a virus, transplanting whole nuclei, transplanting cell hybrids, etc.[3]

Genetically Improved Seedlings: Genetically improved seedlings are the result of a long-term genetic selection process of tree breeding over multiple generations. The trees that perform well across a range of conditions are selected and propagated by grafting in seed orchards or by vegetative cloning.[54]

Genetically Modified Organisms (GMO): Organisms that have been transformed by the insertion of one or more transgenes.[55]

Geographic Information System (GIS): An information system for capturing, storing, integrating, analyzing and displaying geospatial data.[56]

Global Positioning System (GPS): A technology that uses the position of satellites to provide precise location coordinates on the Earth's surface.[57]

Global Warming: A rise in temperatures near the Earth's surface caused by an increase in the atmospheric levels of GHGs. Global warming is the result of the greenhouse effect.[58]

Green Belt: Areas of land whose main purpose it to curb the outward expansion of a large urban area and in which development is strictly controlled.[59]

– H –

Household: Consumption of food in private households. [1]

HRI: Hotels-Restaurants-Institutions. Refers to consumption of food in hotels, restaurants,

and Institutions.[1]

Habitat: The natural environment where an organism, population or community lives, including biotic and abiotic factors.[60]

Harvest: As generally used, to remove all or portions of the trees in an area. Technical definition: To remove trees in an area (1) for financial gain; (2) to develop the environment necessary to regenerate the forest; and, (3) on occasion, to achieve some special objectives, such as the development of special wildlife habitat needs. Contrast with intermediate cut.[61]

Horticulture: 1. The science or art of cultivating fruits, vegetables, flowers, or ornamental plants. 2. The cultivation of a garden.[62]

Hunger: Hunger is an uncomfortable or painful physical sensation caused by insufficient consumption of dietary energy. In this report, the term hunger is synonymous with chronic undernourishment.[63]

Hydrology: Hydrology is the scientific study of the movement, distribution, and quality of water on Earth and other planets, including the water cycle, water resources and environmental watershed sustainability.[64]

Hydroponics: A technique of growing plants (without soil) in water containing dissolved nutrients.[65]

– I –

Illegal, Unreported, and Unregulated (IUU) Fishing: Includes a range of activities, such as fishing without a valid licence, misreporting catch data, falsifying or concealing the vessel's identity or itinerary, or obstructing the work of inspectors/enforcers. These practices pose serious risks to the health of our oceans, wild fish populations, fishers, and consumers. [2]

Incremental Silviculture: Incremental silviculture refers to the silvicultural prescriptions and practices in stands that are past free-growing conditions for the purposes of enhancing stand value and yield.[66]

Integrated Pest Management: Managing forest pests by considering several methods, including cultural, chemical, biological and the use of genetically modified organisms.[67]

Integrated Resource Management (IRM): Integrated Resource Management is a planning and decision-making process that attempts to consider the many interests and issues within the wildlife, parks, forestry, and minerals sectors that affect lands. Once these are considered, an operational plan is formulated. This plan attempts to balance the many concerns with provincial guidelines so that long term sustainable benefits are optimized and conflicts among uses are minimized.[68]

Invasive Species: Species that are non-native to a particular ecosystem and whose

introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.[69]

– K –

ktons: Kilotonnes [1]

– L –

Local Food: Food that is grown, processed, sold, and consumed within the same local area.[9] According to the Canadian Food Inspection Agency, food is considered local if it is either grown in the province in which it is sold or if it is sold within 50 kilometers of the province it was grown in when crossing provincial borders.[10]

Large-Scale Farming: In this report, refers to commercial intensive agriculture, including industrial agriculture, which involves large fields or numbers of animals, reliance on resource inputs (pesticides, fertilizers, etc.), and a high level of mechanization.[3]

Legumes: Fabales family, most of which are herbaceous, sometimes woody plants, including beans, pods, chickpeas, soy, lentils, peas, such as the family.[70]

Livestock: Any domestic animal produced or kept primarily for farm, ranch, or market purposes, including beef and dairy cattle, hogs, sheep, goats, and horses.[71]

– M –

Manufacturing: Activities of secondary processing into finished food products. [1]

MFA: Material Flow Analysis [1]

Meat Adulteration: When meat with a higher commercial value has been replaced or substituted with a meat of lower value or undesirable alternatives. [2]

Macronutrients: Proteins, carbohydrates and fats available to be used for energy; measured in grams. [72]

Malnutrition: An abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes undernutrition (child stunting and wasting and vitamin and mineral deficiencies) as well as overweight and obesity.[73]

Megatrends: Megatrends are potentially transformative, global forces that shape the future, and have far-reaching implications for industries, economies, societies, cultures and personal lives. These implications are varied and dependent on the direction of change megatrends, and especially some of the more uncertain ones, will take over years and decades.[3]

Micronutrients: Vitamins, minerals and other substances that are required by the body in small amounts; measured in milligrams or micrograms.[74]

Micronutrient Deficiency: Generic term designating dietary deficiencies in vitamins, minerals and other substances such as, Ariboflavinosis (riboflavin deficiency), Pyridoxine (vitamin B6 deficiency), Niacin deficiency, Iodine deficiency, and Iron deficiency.[75]

Monoculture: The growing of the same crop species in the same field continuously year after year.[76]

Multiple Burden of Malnutrition: The coexistence of forms of undernutrition (child stunting and wasting and vitamin and mineral deficiencies) with overweight and obesity in the same country, community, household or individual.[77]

– N –

Net Food Importers: Refers to countries or territories where the value of imports of basic foodstuffs outweighs the value of exports of basic foodstuffs.[78]

Non-Communicable Diseases: A non-communicable disease (NCD) is a disease that is not transmissible directly from one person to another. NCDs include Parkinson's disease, autoimmune diseases, strokes, most heart diseases, most cancers, diabetes, chronic kidney disease, osteoarthritis, osteoporosis, Alzheimer's disease, cataracts, and others. NCDs may be chronic or acute.[79]

Nutrition Security: A situation that exists when secure access to an appropriately nutritious diet is coupled with a sanitary environment and adequate health services and care, in order to ensure a healthy and active life for all household members. Nutrition security differs from food security in that it also considers the aspects of adequate caregiving practices, health and hygiene, in addition to dietary adequacy.[80]

Nutrition-Sensitive Information: An action designed to address the underlying determinants of nutrition (which include household food security, care for mothers and children, and primary healthcare and sanitation) but not necessarily having nutrition as the predominant goal.[81]

– O –

OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs [1]

Organic Farming: A method of agricultural production that avoids or largely reduces the use of synthetic chemical inputs such as fertilizers, pesticides, additives and medical products, using instead fertilizers derived from living organisms.[82]

Overweight and Obesity: Body weight that is above normal for height as a result of an excessive accumulation of fat. It is usually a manifestation of expending less energy than is consumed. In adults, overweight is defined as a BMI of 25 kg/m2 or more, and obesity as a

BMI of 30 kg/m2 or more. In children under five years of age, overweight is defined as weight-for-height greater than 2 standard deviations above the WHO Child Growth Standards median, and obesity as weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median.[83]

– P –

Processing: Activities of primary processing of raw food into semi-finished food products.[1]

Production: Activities spanning from field work and barns to farm gates, including raising livestock, growing crops, and fishing. [1]

Pests: A pest is any animal or plant which has a harmful effect on humans, their food or their living conditions.[84]

Photosynthesis: A biochemical process by which the energy of light is converted into chemical energy in plants, algae and certain bacteria.[85]

Planetary Boundaries: Nine boundaries, each representing a system or process that is important for regulating and maintaining stability of the planet. They define global biophysical limits that humanity should operate within to ensure a stable and resilient Earth system—i.e., conditions that are necessary to foster prosperity for future generations.[86]

Pollination: The transfer of pollen from the male organ i.e. anther, where it is formed, to the receptive region of a female organ i.e. stigma by a pollinating agent such as wind, insects, birds, bats, or in a few cases the opening of the flower itself. [87]

– R –

Retail: Retail sales of food in grocery stores and specialized food stores. [1]

Rainforest: A forest of broad-leaved, mainly evergreen, trees found in continually moist climates in the tropics, subtropics, and some parts of the temperate zones.[88]

Reforestation: Re-establishment of forest through planting and/ or deliberate seeding on land classified as forest.[89]

Regeneration: Re-establishment of a forest stand by natural or artificial means following the removal of the previous stand by felling or as a result of natural causes, e.g., fire or storm.[90]

Regenerative Agriculture: Describes farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle.[91]

Remote Sensing: Measurement or acquisition of information on some property of an object or phenomenon by a recording device that is not in physical or intimate contact with the

object or phenomenon under study.[92]

Renewable Resource: Resource that potentially cannot be used up because it is constantly or cyclically replenished or regenerated.[93]

Resilience: Resilience is the ability of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning and without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all.[94]

Ruminants: Animals having a stomach with four compartments (rumen, reticulum, omasum and abomasum) and whose digestive process is more complex than that of animals having a true stomach. Some commonly known ruminants are cattle, sheep and goats; an example of a true stomach animal is the pig.[95]

– S –

Stimulants: Coffee and tea [1]

Satellite Internet: The use of a satellite dish for two-way (upload and download) data communications. [2]

Shade-Tolerance: Shade tolerance is a comparative term used to describe a tree species' ability to become established, grow and persist under shade or low light intensity, quality and duration.[96]

Silvicultural System: Long-range harvest and management schemes designed to optimize the growth, regeneration, and administration of particular forest types.[97]

Silviculture: The art and science of controlling the establishment, growth, composition, health, and quality of forest and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.[98]

Smallholder Farming: Smallholder farming has been defined in a variety of ways. According to the World Bank's Rural Development Strategy, smallholders are defined by their low asset base and operate on less than two hectares of cropland.9 Smallholder farmers are also defined as having limited resources in relation to other farmers in the agricultural sector.10 The various definitions agree that smallholders cultivate both food and non-food products – including field and tree crops as well as livestock, fish and sea products – with limited resources such as land, capital, skills and labor.[99]

Soil Carbon: Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.[100]

Stunting: Low height-for-age, reflecting a past episode or episodes of sustained

undernutrition. In children under five years of age, stunting is defined height-for-age less than -2 standard deviations below the WHO Child Growth Standards median.[101]

Subsidy: Payment or benefit given to partially offset the cost of specific activities, such as the manufacture, production, or export of an article.[102]

Subsistence Farming: Form of farming in which nearly all of the crops produced or livestock raised are used to maintain the farmer and the farmer's family, leaving little, if any, surplus for sale or trade.[103]

Succession: Replacement of one plant community by another until a climax ecosystem in achieved.[104]

Sustainability: The ability of a process or human activity to meet present needs but maintain natural resources and leave the environment in good order for future generations.[105]

Sustainable Development: Development that "meets the needs of the present without compromising the ability of future generations to meet their own needs".[106]

Sustainable Forest Management (Sustainable Forestry): A dynamic and evolving concept, that is intended to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations.[107]

Sustained Yield: The yield that a forest can produce continuously at a given intensity of management. Sustained yield management implies continuous production to quickly achieve a balance between increment and cutting.[108]

– T –

Transpiration: Evaporation of water from the leaves or stems of plants.[107]

– U –

Unavoidable Food Loss & Waste: Food product or components of food products that are designated to waste streams because it cannot reasonably be considered to be edible at any point in its lifespan in the food system. [1]

Universal Basic Income: Government transfer of money to individuals/households without strings attached about how it is used. [2]

Undernourishment: Undernourishment is defined as the condition in which an individual's habitual food consumption is insufficient to provide the amount of dietary energy required to maintain a normal, active, healthy life. For the purposes of this report, hunger is defined as being synonymous with chronic undernourishment.[110]

Undernutrition: The outcome of poor nutritional intake in terms of quantity, quality, poor absorption and/or poor biological use of nutrients consumed as a result of repeated instances of disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (suffering from wasting) and deficient in vitamins and minerals (micronutrient deficiency).[111]

Urban Forestry: The practice of forestry in an urbanized environment.[112]

– V –

Vertical Farming: Practice of growing plants in vertically stacked layers, vertically inclined surfaces and/or integrated in other structures.[113]

– W –

WP: Work Package [1]

Wasting: Low weight-for-height, generally the result of weight loss associated with a recent period of inadequate dietary energy intake and/or disease. In children under five years of age, wasting is defined as weight-for-height less than -2 standard deviations below the WHO Child Growth Standards median.[114]

Wetlands: Marshes, swamps and other water-saturated soils. These areas offer important habitat for wildlife, significant support of nutrient cycling in ecosystems, and protection against severe storms and floods.[115]

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APPENDICES

APPENDICES

Whitepaper: The Lineage and Emergence of Circular Food Economies in North America

The term "Food System" has origins in the 1990's in North American study and practice around holistically viewing — both qualitatively and quantitatively — linking the topics of agriculture, food processing, food distribution, food manufacturing, wholesale trade of food, retail sales, food consumption, health topics related to food (like hypertension, diabetes, obesity), and food security.[32] As the thinking on "food systems" evolves across North America and in Ontario (particularly Northern Ontario), consideration for how to integrate Indigenous food systems and impactful environmental measures grow as well.

> "A circular economy is an economic model that aims to benefit business and society while conserving environmental resources."
>
> *Michigan State University Center for Community and Economic Development EPR white Paper - June 2020*

In the early 2000's, networks of Food System participants began to coordinate and actively co-develop regional economic opportunities around all facets of a regional food system. These participants tend to be made up of diverse networks, often led by not-for-profits, universities, and other organizations focused on research. The networks come in all forms of stakeholder combinations, including farms, food entrepreneurs, manufacturers, scientists, environmentalists, people concerned with food security, grocery stores, food distributors, etc.

These networks began to apply names to themselves like "agro-ecosystems management groups"[33], "Food Hubs"[34], and "Food Corridors"[35], among other names. Often, newly emerging regional food system networks are able to use food as a driver for addressing food security issues in economically distressed communities. Meanwhile, with varying degrees of success, these networks often also seek to pursue some form of economic development in their region around food.

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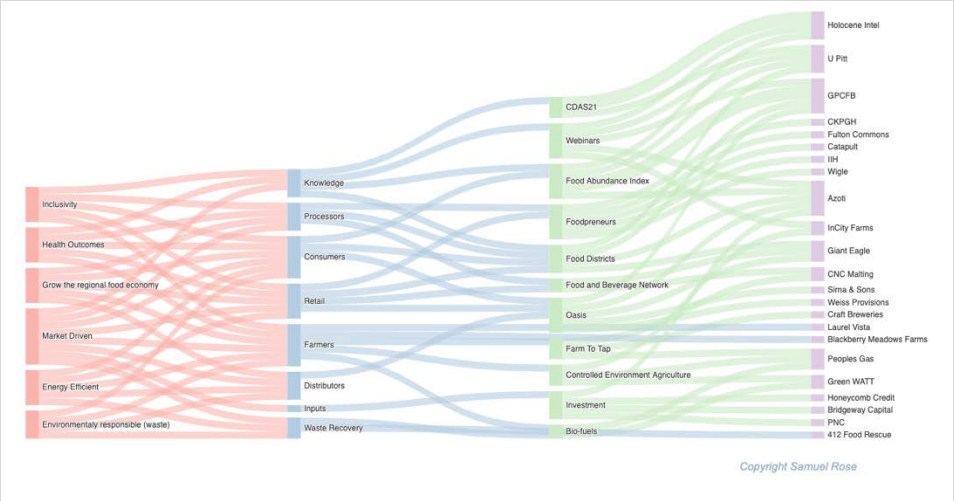
Some initiatives have taken the time to identify a regional geographic area called a "Foodshed".[36] A "Foodshed" is usually defined as a "region". Regions identified for Foodsheds vary in size depending upon the goals of the Foodshed. The selection of the area is intended to create a geographic, economic, and culturally cohesive vision of regional relevancy around food production economies. An example is the Western Atlantic Foodshed as described by Food21 of Pennsylvania at https://www.food21.org/about-food21.

In the industrial midwest, projects like http://localfoodsystems.org/ and https://www.food21.org/ have realized ongoing success by focusing on demand-driven approaches to Regional Food System Value Chain development and management. The methods employed are typically to find and qualify/quantify the demand for various food products, then to map the opportunity through the value chain and back to the producer/farmer in the region, finding the gaps in the system along the way. The gaps are investment opportunities. Producer farms can be coordinated in ongoing demand-planning with customers who buy the raw or finished products. Critical to the understanding and assessment of a food system is the gathering of data about the regional food economy, mapping the assets, and matching the capacities and capabilities of existing participants to the opportunities.

Definition of these regional Foodsheds enable the mapping of KPIs through stakeholders and programs to the initiatives needed to get all of the benefits possible from the regional food economy.



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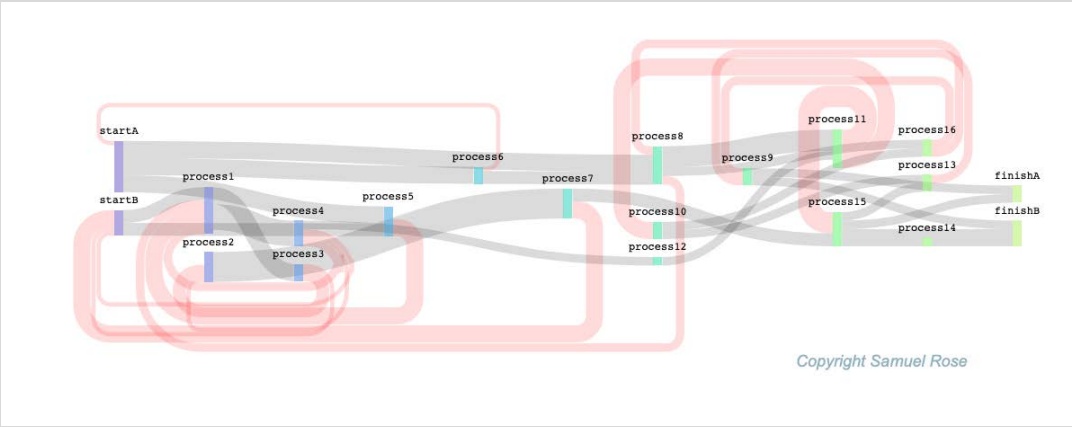


The Food Ecosystem

Below is a model of the food system that characterizes the critical relationships, drivers, and outcomes inherent within such a system. The core supply chain in the circular model however bends round on itself to disrupt the traditional linear model, thereby delivering better triple-bottom-line or ESG outcomes while at the same time creating new opportunities for collaboration and economic prosperity; critical sustainability demands consideration of all three pillars of people, planet, and profit. There are drivers that enable, disrupt, or impede innovation and progress remain largely mired in the linear production model.

Tackling Many Problems at Once with the Circular Food Economy

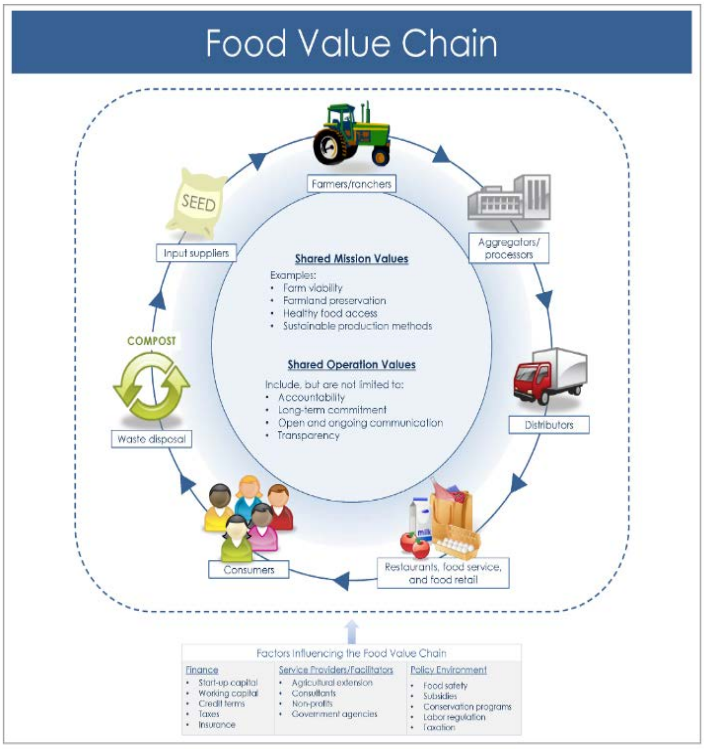
In addition to the promising opportunities of regional food systems as an economic development driver to create jobs and investment ROI, there are also opportunities to address environmental issues, poverty, social equity, and systemic food security by cultivating and sustaining demand-driven "circular food economies".[37]

The concept of "Circular Food Economies" is actively pursued by several US-based foundations, the United States Department of Agriculture, Australian[38] organizations, and others. Circular Food Economies organize around multiple shared values and goals (farmland preservation, healthy food access, job creation, sustainable production methods, reducing and reusing waste from food production, etc.), using long term investment in the regional food system as a vehicle to attain these goals.

https://www.ams.usda.gov/sites/default/files/media/MovingFoodAlongValueChain.pdf

[37] https://www.ellenmacarthurfoundation.org/explore/food-cities-the-circular-economy

[38] https://assets.kpmg/content/dam/kpmg/au/pdf/2019/fighting-food-waste-using-the-circular-economy-report.pdf



Source: Designed by the USDA's Agricultural Marketing Service and the Wallace Center at Winrock International for *Food Value Chains: Lessons Learned from Research and Practice*

The Manufacturing Opportunity

In regions throughout Canada and the United States, significant amounts of agricultural production are exported, which leads to greater year-round diversity, but potential volatility in the food economy and a less secure overall food system.[39] Research and experience shows that increasing the amount of local food production throughout the food supply chain in a specific region (for example, a 240 KM radius) can increase return on investment in terms of job creation and retaining revenue within a region.

There are many secondary industries that can be nurtured and grown by investing in a regional food economy. These include agricultural equipment, finance industries, packaging manufacturing, digital technology, food processing equipment, transportation industries, tourism, and more. In food processing and handling alone, there is a tremendous opportunity to apply right-sizing to processing, service, and packaging for food, as well as introducing digital automation, sensor networks, tracking and tracing, etc., to this space.

[39] https://foodpolicyforcanada.info.yorku.ca/backgrounder/problems/reliance-on-exports/

Food processing equipment is a ~45 billion USD market, food service equipment is a ~$37 billion USD market, and food packaging is an ~$16 billion USD market as of 2016.[40] Moreover, by 2027 the food processing technology market is expected to grow to a value of as much as $340 billion USD.[41]

Examples of Other Relevant Food System Projects Undertaken Across Regions in the US

Alameda County Circular Economy for Food

There are both extreme injustices and opportunities for equalization within Alameda County's current food system. While there is plenty of food available, too much of it is unhealthy, expensive, inaccessible, or wasted. COVID-19 has revealed even deeper vulnerabilities and inequities. Developing a food system that focuses on equity, sustainability, and health can correct many of these concerns – both during this crisis and beyond – but it requires an intentional, systems-level plan. It requires shifting to a philosophy based on a circular economy for food.

https://www.acgov.org/allin/docs/ACGOVCircularEconomyforFood-PathwayforGrowth-lowres.pdf

Cultivating the Circular Economy in California: A Snapshot of the Purchasing Power of School Meal Programs in California

Within the United States, Farm to School Programs, for example, that support local procurement practices can cultivate (1) economic capital by increasing the net sales, creating new labor income and improving the local purchasing power; (2) natural capital through reduced CO2 emissions, regenerative practices for land restoration and diversification; and (3) social capital through increased access to healthy food and job creation that may increase local economic activity and improve quality of life. (See Figure 1). In this paper, we focus on the role that school districts can play in shaping the food system within the state of California.

https://www.filepicker.io/api/file/Sku5oX9hTEi9D0L1P2yo

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40 https://www.mckinsey.com/~/media/mckinsey/industries/advanced%20electronics/our%20insights/whats%20ahead%20for%20food%20processing%20and%20handling/mckinsey-on-food-processing-and-handling-ripe-for-disruption.pdf

41 https://www.emergenresearch.com/press-release/global-food-tech-market

Zero Waste and A Circular Economy

The Zero Waste Connection is a network of zero waste professionals from business, federal, state, and local programs. The site contains an information clearinghouse of resources to support programs and help professionals move their organizations toward a zero waste to landfill goal. The goals of the Network are:

- Provide forums for zero waste professionals to share information on program development and implementation;
- Foster innovation in zero waste programming through the exchange of ideas in real time;
- Increase the adoption of zero waste practices among practitioners; and
- Increase awareness of zero waste opportunities and resources.

https://www.wisconsinsustainability.com/zero-waste

Examples of Relevant National Food System Projects in Canada

Canadian Food Innovators Network (CFIN)

CFIN aims to kickstart innovation within Canada's food and beverage processing sector by connecting stakeholders through digital resources and collaborative activities, such as advanced technology platforms, industry advisors, and events. The goal of CFIN is to improve the competitiveness and sustainability of the agri-food sector by making existing innovations and best practices available to a wider range of stakeholders in the agri-food system through the creation of a digital hub.

http://www.ic.gc.ca/eic/site/125.nsf/eng/00031.html

Canadian Agri-Food Automation and Intelligence Network (CAAIN)

CAAIN is a grouping of technology and agri-food companies, universities, colleges, and research institutions working together to create new technological solutions for agricultural and food producers. Projects focus on using techniques in artificial intelligence, advanced sensor technologies, hyperspectral imaging, and blockchain applications to increase the productivity of agri-food businesses.

https://caain.ca/about-us/

Examples of Relevant Food System Projects Provincially

Windsor-Essex

Region boasts more than 2,000 acres of greenhouse operations — the largest vegetable greenhouse cluster in North America. National and international food processing companies have significant operations in the region include Diageo, Unico, Bonduelle, Highbury Canco, Hiram Walker and ADM. Reputation for cutting edge technology application to support the highly competitive greenhouse sector.

https://www.investwindsoressex.com/agribusiness

Harrow Research and Development Centre

AAFC established one of its 20 research centres in the region, the Harrow Research and Development Centre. The Harrow is one of the largest greenhouse research complex facilities in North America, focused on developing and transferring new technologies for the production and protection of greenhouse vegetables and ornamentals, and field crops (soybeans, edible beans, corn, winter wheat and tomatoes).

https://profils-profiles.science.gc.ca/en/research-centre/harrow-research-and-development-centre

Hamilton

Home to over 120 food and beverage manufacturers across the agri-business and food processing supply chain (meat products, baked goods, sugar/confectionery, and beverages), projecting itself as a major regional food processing cluster with road, rail, and shipping access to major export destinations.

https://investinhamilton.ca/industries/agri-business-and-food-processing/

Ottawa (AIC)

The Agricultural Institute of Canada (AIC) is focused on agricultural research and innovation with a mission to

- Influence public policy;
- Disseminate information;
- Promote careers in agricultural research and innovation;
- Facilitate networking; and,
- Encourage international linkages.

https://www.aic.ca/about-aic/

Key Considerations	Description
Geography	• What is unique to the Guelph Wellington region? Strengths? • What would be unique about a food hub in this region? • How does a food hub interact with other geographies, institutions, and networks?
Core Challenges	• What happens if/when a food hub is created? What problems does it solve? • What are the foreseeable barriers?
Core Opportunities	• What is enabled and/or supported by a food hub? • In the community? • Beyond?
Outputs	• Cold storage. • Renowned innovation hub – a “cool” place to congregate, share, and demonstrate ideas. • Commercial kitchen and/or manufacturing facilitates • Platform for matching ‘waste’ suppliers with potential repurpose users.
Outcomes	• Showcase pilot projects to demonstrate tangible potential of CEF. • Facility that puts Guelph Wellington “on the map” in advancing CEF ideas and innovations. • New technology driven circular business models.
Enablers	• Policy, regulation and by-laws. • Services. • Market intelligence, data and information. • Infrastructure. • Access to capital and other financial services. • Corporate interest and participation. • Access to talent.

Overlapping Initiatives

Dillon Consulting - Food Waste Flow Study

Research Summary prepared by Pollinate Networks Inc.

2021/05/17

Executive Summary (Produced by Dillon)

- Infrastructure Canada has awarded the City of Guelph and Guelph Wellington funding for the creation of Canada's first circular food economy through the Smart Cities Challenge
- Three central goals of this project - to increase access to food by 50% by transforming waste into a resource, to create 50 circular businesses/collaborations, 50% economic benefit through the creation of a circular food economy
- Rural areas of the County of Wellington will be the chief supplier of food to the City of Guelph (main crops being corn, wheat, and soybeans, main animal products being dairy, beef, poultry, and swine)
- To understand the waste at each level of food production (food products, production, processing, distribution, consumption, end-of-life), Guelph Wellington commissioned a material flow analysis
- Data for each stage collected from public sources and purchased from the private sector
- Most important sites of food waste - farm fruit losses before manufacturing, the losses of cereals at the processing stage
- Important findings:
    - Food waste largest in storage/packaging loss (31.2 kilotons), processing planned loss (23.1 ktons), processing unplanned loss (12.1 ktons), production loss (10.5 ktons), manufacturing planned loss (8.2 ktons), manufacturing unplanned loss (6.2 ktons) - overall food loss of 91.3 ktons - based on these findings, storage/packaging loss, especially for fruits and veggies, merits the most attention
    - The vast majority of food produced in and around Guelph is exported for processing, rather than being processed locally
    - Wheat, with a 206% surplus, is the only crop produced in Guelph Wellington that could satisfy local demand - other food products must be imported
    - Dairy and meat have the greatest environmental impact (carbon dioxide equivalent emissions, water use, eutrophying emissions (pollutants), and land use) on the region

Work Package One

- Main goal - to use both public and private data sources in order to map the flow of food in Guelph
- Work package one - launched in March 2020 - data collected by the City (Our Food Future) as well as consulting team
- Advisory Panel containing relevant expertise convened to support these efforts
- Phases of work package one
    - Phase one - kickoff meeting, setting of timelines, overview of available data
    - Phase two - identification of gaps in available data, supplemented by data accessible to the consulting team
    - Phase three - aggregation of data, creation of a material flow analysis (based on inputs, which are equal to outputs as well as stock, or the quantity at a single point in time), synthesis into Sankey diagrams (graphic depiction of food flow)
- Advisory Panel provided feedback at all stages of the process
- Methodology of the flow analysis - though Guelph Wellington acted as the study area, this project examines both production, processing, manufacturing, and distribution, as well as the outward flow of food waste, both of which fall outside of the county
- Local production of food for export was also considered
- Data sources - StatsCan data on food consumption (kg/person/year) scaled up to the population of Guelph Wellington, although averages adjusted for regional factors (local waste management techniques) - also consults Guelph Wellington production data from OMAFRA
- Our Food Future, consulting team, and the Advisory Panel worked to select 70 relevant datasets
- Aspects of Guelph's food economy - large beef and dairy processors, small and medium-size animal food processors, crop processors, specialty organic food processors
- One large and several small and medium-size food distributors responsible for food imports and exports
- Food retail - grocery stores, natural food stores, farm-to-consumer outlets, chain and independent restaurants
- Waste - organics management - residents separate organic food waste - it is collected weekly and transported to the Waste Resource Innovation Centre (although organic waste is not separated in hotels and restaurants, which is an opportunity for innovation)
- Organizations involved in the Advisory Panel - Our Food Future, City of Guelph, University of Guelph, National Zero Waste Council, OMAFRA, Wellington Federation of Agriculture, Oakdene Hollins, Ivey, City of Toronto, David Suzuki Foundation, MetabolismOfCities.org, Dillon Consulting, Metabolic, Provision Coalition
- Other stakeholders involved - Dr. Michael von Massow

- Consumption flow analysis - involves 366 commodities, 16 aggregated food flows - could allow for interventions targeting specific commodities or flows - visualized as a Sankey diagram on page 26 of the document (food source on the left, food use in the centre, food exiting the flow on the right) - important findings from this diagram as follows
    - Most food produced in Guelph is exported elsewhere for processing, although some of this food returns to Guelph for consumption
    - Fruit is the most widely produced and consumed food product (followed by cereals in veggies in consumption)
    - Most food waste (both planned and unplanned) ends up in landfill
    - Food waste primarily occurs during the storage/packaging stage, although also as planned processing loss (since this loss is predictable, waste mitigation strategies could have a large impact here) - the same opportunity exists with unavoidable household food waste
    - With avoidable household food waste, food rescue programs could be helpful
    - Share of food waste sent to landfill rather than being composted will likely decrease with the new green bin program
- A production flow analysis was also produced (page 31 of the document) - whereas the consumption flow analysis shows the flow of local food production, the production flow analysis illustrates the quantity of various food products produced - important findings from this diagram are as follows
    - Most food production is devoted to animal feed, which is mostly consumed locally, although there is also significant production of cereals, milk, oil crops, and poultry
    - Self-sufficiency could be achieved for wheat flour (production is 206% of consumption), but all other products (dairy, eggs, beef, pork, fruits and veggies, lamb, chicken) fall short of 50%
    - Grain products are Guelph's most valuable exported food product (exports mainly to Europe and Latin America), while fruits, nuts, and veggies are Guelph's most valuable imported food products (imports mainly from Oceania and Africa)
- Environmental impacts of food flows - the top 25 of the 366 total commodities represent 90% of equivalent carbon dioxide emissions, with largest impact coming from meat and dairy products (this should be the central focus of emissions reduction strategies)
- Aside from equivalent emissions, meat and dairy also have a significant impact with respect to freshwater withdrawals, eutrophying emissions, and land use
- Another way to quantify environmental impact is to consider emissions per nutritional unit - based on this, meat has the highest emissions per 100 grams of protein, while fruit has the highest emissions per 1000 kcal
- Overall, total emissions are roughly 1300 kilotons of carbon dioxide equivalent, with feed, beef, and oil crops accounting for 70% of this impact

- Additional data was purchased from Nielsen (purchasing data for 358 commodities in Guelph between 2018 and 2020) and a local grocery store chain (unique transactions with dollar amount of sales) to cross-reference with the modelling data from the material flow analysis, although this data was ultimately not included in the Sankey diagram due to uncertainties concerning unit conversion
- Although the impact of the pandemic remains uncertain (datasets only track before March 2020), it does appear to have generated more demand for local food, as well as resulted in more waste being created at home compared to restaurants (this is good since it means that more waste is being composted)
- Next steps
    - Work package two - to be funded by the Federation of Canadian Municipalities - three different milestones:
        1. Identify stakeholders, work with these stakeholders to establish vision and objectives, develop social, economic, and environmental indicators for the project
        2. Evaluate potential strategies to address food waste hotspots
        3. Communicate these results to Our Food Futures for feedback
    - Work package three - this will take shape based on work package two, but will likely focus on a spatial analysis to determine where interventions should take place (to be done by Jude Keefe) - feasibility studies will be conducted to determine what exactly implementation will look like - finally, other cities will be encouraged to take similar steps

House of Commons - Food Processing Report

Research Summary prepared by Pollinate Networks Inc.

2021/05/11

Federal Report on Canadian Food Processing Capacity, Food and Beverage Canada
Summary of this Report

- Author of the report - the House of Commons Standing Committee on Agriculture and Agri-Food, aimed at "...the federal government, its provincial and territorial partners, and private sector producers and industry." (p. 46 of the report)
- 18 recommendations to make the sector more innovative and competitive, with more of Canada's food processed domestically as well as a strengthened supply chain
- Based on the need to take advantage of global food consumption trends by increasing export capacity, as well as need to strengthen Canada's food supply chain, especially in light of COVID-19 and global instability
- Recommendations **1, 2, 3, 6, 10, 11, 12, 13, 14, and 15** highlighted by Food and Beverage Canada
- **Recommendation 1** - federal investment in trade infrastructure

    - Investment in capacity at transport corridors (ports, rail) to eliminate bottlenecks
- **Recommendation 2** - regulatory changes/targeted programs to encourage development of small food processing businesses
- **Recommendation 3** - funds for regional processing capacity to strengthen supply chain
    - Bottlenecks/capacity limits at processing sites force beef farmers to maintain cattle for longer than is profitable, could be resolved by smaller-scale regional/mobile abattoirs which would help to shorten the supply chain by making processing sites more accessible to farmers
- **Recommendation 4** - Local Food Infrastructure Fund to support regional agri-food business
- **Recommendation 5** - federal actions to combat food insecurity
    - Greater access to capital for local food cooperatives, federal funding for school food programs as well as food security initiatives in Indigenous communities
- **Recommendation 6** - external review to find an appropriate balance between streamlined regulation and food safety
    - Current regulations focus too much on mandating processes rather than encouraging competitive outcomes - this has forced companies to move operations outside the country - modernized regulatory framework could allow businesses to develop innovative solutions while ensuring food safety
- **Recommendation 7** - harmonization of federal/provincial processing standards to reduce trade barriers
    - Differences between federal and provincial safety standards mean that food processors often find it difficult to expand operations beyond a single province
- **Recommendation 8** - standardization of food inspection measures
    - Greater oversight of food inspectors could ensure a more uniform application of safety standards at different processing sites
- **Recommendation 9** - changes to slaughtering regulations in order to increase competitiveness of beef industry
    - Easing regulations related to “Mad Cow Disease” (which has had a very low incidence recently) could increase beef exports
- **Recommendation 10** - investment in innovation hubs to increase productivity
- **Recommendation 11** - greater foreign direct investment in agri-food research and development

    - Federal assistance to help smaller processors adopt new technologies could help to bridge the productivity gap emerging between businesses - innovation clusters, bringing together industry partners for research and development, could help to make Canada more attractive for foreign investment

- **Recommendation 12** - increase access to labour by lifting cap on low-wage Temporary Foreign Worker Program jobs
    - Increasing the cap on low-wage jobs provided by the TFWP from 10% to 20% (or higher) could help to address labour shortages in food processing
- **Recommendation 13** - increased access to the Agri-Food Pilot Program
    - This program allows for temporary foreign workers employed in food processing to gain permanent residency - expanding it could allow for workers to be retained in greater numbers, another way of addressing labour shortages
- **Recommendation 14** - training and reskilling to meet agri-food labour requirements
    - Raising awareness about opportunities for growth in agri-food as well as high wages could help to recruit more workers beyond the TFWP
- **Recommendation 15** - technological development - automation, Internet access for rural food processors
    - Automation could limit dependence on a shrinking labour supply, although this will only be possible with federal assistance/skilled workers to develop automated processes, as well as reliable Internet
- **Recommendation 16** - federal/provincial implementation of a grocery code of conduct
    - Corporate consolidation in the grocery sector has allowed for retailers to extract concessions from processors, resulting in a negative impact on smaller agri-food businesses - this could be remedied by a grocery code of conduct governing dealings between the two sectors
- **Recommendation 17** - increased access to capital for small agri-food businesses
    - Investors are often reluctant to invest in processing firms, resulting in difficulties expanding capacity
- **Recommendation 18** - better monitoring of agricultural imports to ensure they match with equivalency standards
    - Agricultural imports are often subjected to less stringent regulations than domestic food products, which puts producers at a disadvantage

Food and Beverage Canada Summary:

https://www.foodincanada.com/processing/food-and-beverage-canada-welcomes-new-report-on-processing-capacity-148934/?custnum=&CUSTNUM;&title=&*URLENCODE(&TITLE;)&utm_source=&PUB_CODE;&utm_medium=email&utm_campaign=&*URLENCODE(%7B%7B*JobID%7D%7D)&oly_enc_id=5789H6222356F6Z

House of Commons Report:

https://www.ourcommons.ca/Content/Committee/432/AGRI/Reports/RP11265969/agrirp04/agrirp04-e.pdf

NGen - Agri-Food Webinar

Research Summary prepared by Pollinate Networks Inc.

2021/05/12

Agri-Food Webinar (Zoom)

- NGen Speakers - John Laughlin - Chief Tech Officer at NGen, Gillian Sheldon - Director of Investor Partnerships
- NGen - not-for-profit - administers and runs funding programs, including supercluster programs (primary focus), dedicated funding for SMEs
- Supercluster programs - building advanced manufacturing capacity in Canada, targets for 2030
- Building collaboration portal to facilitate company partnerships
- Tech and manufacturing companies partnered to solve particular problems
- Hundreds of millions of dollars worth of purchase orders, six new companies created, on track for 12,000+ new jobs
- Food and beverage sector - typically slow to adopt new tech - NGen aiming to change this
- Switching from import of automation tech to domestic production
- Partnerships - Vineland, Metro Vancouver, Guelph Wellington County (food hubs, circular economy innovation)
- Guelph as a regional hub to provide a blueprint for larger initiatives
- Barriers to entry in agri-food - tech, funding, capital, regulations, labour costs
- Phil Stephan - Vice President of Business and Client Development at Vineland
- Vineland - connecting opportunities for automation with agricultural sector, aiming to increase competitiveness of horticulture in Canada
- Founded in 2007, independent not-for-profit research institute
- Conducts research to demonstrate viability of horticulture across a full spectrum (fresh fruits, veggies, flowers, cannabis)

- Innovation goals - to diversify and enhance mix of horticulture products available to Canadian growers, to develop and commercialize automation tech as a solution to address labour constraints, increasing the environmental performance of horticulture
- Five program areas - plant variety development (related to first goal), automation (related to second goal), consumer insights (related to all goals), plant responses and the environment (related to third goal - environmental stewardship), biological crop protection (related to third goal - to relieve disease pressures)
- Dan Bath - research scientist (focusing on automation)
- Increasing mechanization/automation in several sectors of agriculture, but not all - sectors such as horticulture have progressed more slowly since products are more delicate/less amenable to automation - therefore, most horticultural products are harvested by hand
- Still, developments in robotics, big data machine learning could remedy this - for example, computer vision
- Incentives for tech adoption - growth of agricultural sector ($85 billion by 2025), labour shortage (projected to get worse)
- Based on these, governments have invested significantly in agri-food (especially with COVID-19)
- Vineland has worked with the Government of Ontario and growers' associations to address tech gaps
- Tech can be classified based on whether or not it is pre-commercial, in development, or the concept phase - also based on capital required and time necessary for implementation
- Examples of tech in development include the robotic harvester and mechanical harvester
- Opportunities for tech development with smaller growers, but currently limited investment in solutions which require less capital and time for implementation - divergent models of automation - large vs. small farms
- Question of regulatory approval - for example, flying drones in vegetable processing
- Case study - harvesting of cucumbers - Vineland has developed an autonomous robot which can harvest cucumbers in a greenhouse - needs manufacturing partner to scale this tech up, could also be adapted for other crops
- Hussam Haroum (bio under the automation tab) - Director of Automation
- Automation program - aim to reduce labour costs, improve productivity - maximize return on investment for growers and manufacturers
- Prototyping and research at Vineland helps to make these products less risky for investors
- Can collaborate with Vineland through both online surveys and one-on-one interviews
- Tech roadmaps to address particular needs of growers - for example, broadband access for rural producers

- Partnership with NGen - looking for partners to contribute to automation, mechanical tech, real-time farm management software - NGen represents a collection of the best tech capabilities in Canada, Vineland understands the needs of particular growers - aim is to connect these two parties (Vineland's research can also derisk the adoption of new tech)
- Central goal of automation tech is labour savings, but connections to climate change - for example, crop management software could help with adaptation
- Automation tech leaders - Clearpath, Kinova
- LinkedIn pages for John Laughlin and Gillian Sheldon available through their bios, contact information for Phil Stephan, Dan Bath, and Hussam Haroum available through the Vineland staff directory

Automation innovation at Vineland

https://www.vinelandresearch.com/research-program/automation/

Outcast Upcycled Nutrition

Research Summary prepared by Pollinate Networks Inc.

2021/05/12

Outcast Upcycled Nutrition

- **What this organization does:** Outcast takes reject produce from farmers and transforms it into dried powders - the dried powders created from the produce are either made available to consumers in the form of plant-based, organic supplements like protein powder (sold at places like SportCheck and Sobeys) or are sold to producers and incorporated into other products such as condiments, pet food, and cosmetics (they've recently partnered with Happy Planet, for example)
- **Where this organization is located:** The produce is transported in cold trucks from farms to their central facility in Halifax (so currently they are only working with farmers in this area) - they are planning on opening a new facility in Southern Ontario, although no info as of yet as to where this facility will be located (but their website said that as they expand they plan to locate more facilities close to farms in order to reduce transportation time)
- Contacts:
    - wholesale@outcastfoods.com (this address is meant for inquiries from grocers and producers)

- info@outcastfoods.com (this address is meant for ambassadors looking to partner with Outcast)
- yellow@hello.com (this address is meant for general inquiries)
- CEO - Dr. Darren Burke, CMO - TJ Galiardi

Urban Food Futures - Foodshed Analysis Research Article

Research Summary prepared by Pollinate Networks Inc.

2021/05/13

Organizations/People Involved

- Urban Food Futures - an online science magazine - focused on the food needs of cities, where this food is sourced, and how sustainable urban food supply chains are - aim is to remedy growing food insecurity in many cities by connecting governments, the private sector, and NGOs to scientists
- Their monthly “Coffee Break” articles highlight and summarize important scientific publications (like the one below)
- Kerstin Schrieber is the lead author of the study and the author to whom questions about the study should be addressed (kerstin.schreiber@mail.mcgill.ca)

Summary of Foodshed Analysis Article by Urban Food Futures

- Provides an understanding of the land necessary for a particular area’s food production, as well as where this food production occurs
- Helps to demonstrate linkages between food production in rural areas and food consumption in urban areas
- These studies should be supported by better methodologies and should be consulted in food policy development
- Since urban areas consume more food than they produce, foodshed analysis is important since it helps to reveal any vulnerabilities in a city’s food supply
- However, foodshed analysis has varied in methodology and scale, which makes comparison and extrapolation difficult
- Three types of foodshed studies
    - Capacity studies - these measure land area and food production to determine whether or not a particular site could achieve self-sufficiency
    - Flow studies - these examine the supply of food from source to recipient

    - Hybrid studies - these studies combine capacity and flow studies to determine the degree to which self-sufficiency could impact the food flows in and out of a city/region
- Problems with foodshed analysis - crop-based, environmental, and socio-economic data is often not properly integrated into these studies, and those conducting these studies often don't have an understanding of their limitations
- Priorities to improve research - more consideration of the physical and social limitations preventing a particular area from realizing self-sufficiency - a better understanding of flows in a foodshed (waste, nutrients) could create connections between foodshed analysis and the circular economy
- With these improvements and more government/private sector support, foodshed analysis could better serve policy/planning purposes

Environmental Research Letters: Quantifying the foodshed: a systematic review of urban food flow and local food self-sufficiency research

- Globalization has resulted in an increasing disconnect between food producers and consumers - supply chains have been extended to offer urban residents a greater variety of food products, but dependence on imports can result in vulnerabilities
- The foodshed - "...used to discuss the geography of urban food supply and particularly to describe the linkages between food-producing and food-consuming regions at different scales." (p. 2) - how food flows from sources, how environmental factors impact these sources, and the logistics involved in transportation from these sources
- In this article, the authors aim to synthesize the various types of foodshed analysis by examining relevant research articles across different scales and methodologies
- Authors searched for foodshed analyses using relevant terms, and identified 42 relevant articles, selected from 829 candidate studies - these articles were then classified by type, geography, and methodology
- According to ten criteria (aim, calculation method, unit, data source, diet model, spatial boundaries, optimization model, food surpluses, food flows, scenarios), these 42 studies were then divided into three broad categories - LFS capacity studies, food flow studies, and hybrid studies
    - Capacity studies - these studies compare urban food consumption with the productive potential of surrounding rural areas - they are especially relevant to policy-makers seeking to make a city/region more reliant on local sources
        - These studies involve particular methodologies (self-sufficiency and inverse self-sufficiency thresholds) to determine the ratio of overall food demand to local productive capacity, as well as foodshed size calculations to determine the local land necessary to meet food demand

- Some of these studies, in order to estimate the maximum extent of LFS achievable in a given area, optimized the distance between consumer and producer and also optimized crop yields
- Limitations - these studies combine population with a theoretical diet to determine the overall food demand, but this diet is often based on nutritional guidelines rather than actual consumption and is therefore not necessarily an accurate representation

- Flow studies - these studies map out the food supply chains which support urban food consumption, the resources necessary to maintain these supply chains, and vulnerabilities which might jeopardize urban access to food
  - These studies trace the distribution of processed and unprocessed foods from their point of origin, demonstrating the resources and emissions embodied in these flows as well as the various actors involved in each stage of the food supply chain
  - They also point to the potential strengths and weaknesses of moving towards LFS (one weakness being that having a single, local source of food can leave food supply vulnerable to local disasters)
  - Limitations - many of these studies only focus on the origin and the endpoint, rather than intermediate production and distribution stages
- Hybrid studies - these studies examine LFS potential in relation to a city/region's position in existing food supply chains
  - These studies help to illustrate that despite a high degree of theoretical LFS, the predominance of a particular crop in a city/region could make it better suited to food exports - in this way, hybrid studies offer a more fulsome picture of the strengths and weaknesses of LFS
- Each of these study types - capacity, flow, and hybrid - calculate production, consumption, and resource use in a similar manner
  - Production = yields x weight, nutrition, or land
  - Consumption = population x weight, nutrition, or land (per capita)
  - Resource use = emissions ÷ yields x food quantity
- The spatial boundaries involved in each study were diverse, with different studies employing geographical, administrative, or ecological boundaries
- These sort of methodological differences make comparison between different foodshed analyses difficult (different studies examining the same area have reached different conclusions with respect to foodshed size)
- However, foodshed analyses have great potential - for example, they can help to illustrate how dietary changes can help to achieve LFS in areas where agricultural expansion is non-viable
- Aspects of foodshed analyses relevant to policy-makers include farmer livelihoods/rural development, infrastructure, land competition/management, on-farm management/decision-making, supply chains/marketing, diets, food preferences, and access to food

- Overall, in so far as they indicate LFS potential as well as the interdependencies existing between urban and rural regions, foodshed studies could be critical tools for policy-makers - with this in mind, hybrid studies are perhaps the most valuable of the three types of foodshed analysis, since they consider LFS in relation to larger trade, economic, and social interconnections
- The authors suggest that some problems with foodshed analysis need to be resolved - the first is that capacity studies often ignore the logistical/infrastructural barriers to localization, as well as the question of whether or not consumers will actually desire local food - therefore, more data should be incorporated
- Another problem is that many foodshed analyses ignore the question of inputs into food production - the supply chains that provide local producers with necessary materials are often themselves vulnerable - therefore, foodshed analyses should consider how to make the systems underlying food production more sustainable (related to the circular economy - could incorporate local waste into food production)
- There are also significant uncertainties involving data - many studies don't consider how socio-economic status/culture influences diet - additionally, LFS would result in seasonal changes to the supply of food, which would affect consumer behaviour - finally, primary data, including food availability and types, as well as the social networks underpinning production, is often missing

With this in mind, there are opportunities for funding from governments and the private sector to bridge these data gaps and to increase the scale/technological breadth of research.

CAPI - The Big Solutions Forum

Research Summary prepared by Pollinate Networks Inc.

2021/05/20

CAPI (Canadian Agri-Food Policy Institute) - The Big Solutions Forum - Webinar

- Tyler McCann - Chief Engagement Officer at CAPI
- CAPI - independent policy think-tank focused on agri-food sector
- Need to meet new challenges - COVID-19 and food security, increased global demand, climate change, all while ensuring that Canada is more competitive - need to produce more, and better, with less
- This can be accomplished through innovation grounded in science

- Financial partner - Agriculture and Agri-Food Canada - need to have a more diverse funding model/recruit new financial partners
- The Big Solutions Forum webinar - a culmination of the Creating Prosperity From Chaos research drive
- The full report from this drive will be released in two weeks, but an executive summary of the report is on the website
- Ted Billyea - Chief Strategy Officer at CAPI
- Key insights - agri-food is both a driver of growth and a life-sustaining industry
- Relatively eco-friendly industry, but sustainable growth requires increased productivity with an eye on environmental outcomes
- Four key actions - strategic thinking, systems approach, public-private partnerships, aspirational leadership
    - Strategic thinking - geopolitical, trade, health, environmental challenges to food systems - these could be leveraged to Canada's advantage, but producers have not yet been able to do so
    - Systems approach - interdependency of trade, sustainable intensification, environmental outcomes - need to take advantage of natural capital, human capital, and socio-economic capital - can only be accomplished if different sectors come together for a multi-disciplinary approach, bridging the gap on innovation, regulations, policies
    - Public-private partnerships - must bring together industry, academia, governmental institutions - need for more knowledge and data to drive sustainable growth
    - Aspirational leadership - need to be proactive, not reactive in setting agri-food policy
- First panel - five deputy ministers, moderated by Rickey Yada
- Chris Forbes (Deputy Minister of Agriculture and Agri-Food), Simon Kennedy (Deputy Minister of Innovation, Science, and Economic Development), Christine Hogan (Deputy Minister of Environment and Climate Change), Harpreet Kochhar (Associate Deputy Minister of Health), John Hannaford (Deputy Minister of International Trade)
- Opening remarks
    - Chris Forbes - world needs more food, climate change and population growth impacting food production - Canada well-positioned to contribute to this demand - need to improve environmental performance at home - importance of innovation/research and development - Canada can take pride in the safety and quality of our food, something to communicate abroad - public-private partnerships already strong (federal-provincial cooperation on agri-food, trade commission represents companies abroad), foundation for future collaboration
    - Simon Kennedy - the pressures facing the agriculture sector are the same pressures facing the rest of the economy - important to account for these pressures, despite Canada's strong natural capital - pandemic has

underscored these challenges (supply chain resiliency, need for digital adoption, which will be a serious contributor to GDP, climate change, inclusion - cross-disciplinary work to increase competitive advantage (supercluster program designed to break down barriers)

- Christine Hogan - environmental crises - biodiversity, climate change - not necessarily constraints but opportunities, especially for agri-food - biodiversity loss will impact agricultural production - productivity must not increase at the expense of biodiversity indicators - new climate plan released in December - whole-of-government effort driven by science - designed to embrace the power of nature and facilitate climate-smart agriculture as well as resilience and adaptation
- Harpreet Kochhar - pandemic has inspired innovation and regulatory flexibilities to ensure stability of supply chains - agri-food sector in particular has been resilient - need to understand the relationship between environment, humans, and animals in light of our globally-connected systems (one-health approach), partner with relevant stakeholders to facilitate innovative solutions/common dialogue between different sectors
- John Hannaford - global challenges - geopolitics (impacting trade), climate change - should frame the way we operate in the international system - but Canada's agri-food sector has real advantages which can be marketed abroad - need for trade diversification, deepening relationships in southeast Asia (ASEAN bloc)

- Can we have a climate change policy not connected to agri-food policy?
  - Overall - no, we cannot have climate policy disconnected from agri-food policy
  - Christine Hogan - climate change will have a serious impact on global food systems - these policy areas are coming closer together, especially in the area of food waste)
  - Chris Forbes - food production could be more climate-friendly - will require deepened partnerships to foster adoption of tech, connectivity
  - Simon Kennedy - rural broadband issue an important part of agri-food considerations - federal plan is to achieve connectivity by 2026-2030
- Why don't we do a better job of leveraging our domestic strengths in international fora, producing more value-added exports?
  - John Hannaford - opportunity for better branding, but we currently have a significant influence on international processes through our expertise in trade/standards negotiation
  - Chris Forbes - more we can do, but current initiatives strong
- What more can be done to promote a one-health approach in international organizations?
  - Harpreet Kochhar - policy on antimicrobial resistance currently reflects one-health approach - Canadian experts currently playing a big role in

international organizations - academia/research important stakeholders in advancing conception of one-health

- Second panel - industry leaders, moderated by Rory McAlpine (CAPI board member)
- Gaétan Desroches (Sollio Cooperative Group), Bettina Hamelin (Ontario Genomics), Bill Greuel (Protein Industries Canada), Katelyn Duncan (Backswath Management), Chris Terris (Telus Agriculture Canada)
- Gaétan Desroches - chief imperatives - to produce in a more sustainable fashion, to produce value-added products (must improve supply chains through tech and tech transfer in agriculture/industry), partnerships (must make use of start-ups), trade (need to have trade regulations that are clear and transparent)
- Chris Terris - how to achieve tech/digital solutions uptake - need to appeal to consumers, agri-food, primary production (tech to make production more efficient, sustainable, profitable) - long-term approach - data provenance to demonstrate profitability of sustainable tech adoption for producers - must link data across sectors
- Bill Greuel - interconnectedness/systems approach - problems/opportunities of the present day cannot be solved in an isolated fashion - must reach across the entire supply chain to change behaviours across the board/increase trust in the sector
- Bettina Hamelin - public-private partnerships in genomics - challenges that require solving inform research and necessitate collaboration - role to be played by science (lines between scientific disciplines are blurring - convergence between genomics, big data, AI, robotics - creation of a new sector - engineering biology) - tech enables us to use inputs (food waste) in innovative ways - Canadian venture capitalists investing in this new tech (but tech alone is not a silver bullet - must be bundled with socio-economic policy and regulatory changes)
- Katelyn Duncan - how does tech adoption look at the farm level? How can tech be de-risked and incentivized for uptake at the farm level? Ambitious but necessary dialogue - change is difficult - adoption of modern agriculture in the 70s increased productivity, but these have resulted in negative externalities (health, environment, socio-economic factors) - now, new problems that need to be solved - need for nutrient dense foods with limited negative externalities and economic opportunity - next generation of producers is concerned by these problems - solutions require collaborative approach (producers, consumers, Indigenous communities)
- Building environmental and social objectives into the business mandate (competitiveness) - new consumer demands intersect with these objectives, but tech must be scaled up to meet this demand
- Farmers share concerns about climate crisis, must therefore think about tech transfer to producers
- Opportunity for the circular economy - tech to convert food waste, opportunity for biofuels/biofertilizers
- Adoption of new tech must have a clear ROI - there must be an obvious value proposition for producers

New partnerships? Siloes between industry associations in agri-food sector (over 400 separate associations) make it hard to establish a common voice - need to establish cohesion in the private sector, since the climate crisis is too big for any one entity to solve.

Smart Prosperity Institute - Circular Food Economy

Research Summary prepared by Pollinate Networks Inc.

2021/05/25

Circular Economy Global Best Practices - Agri-Food

- Contributors - Justine Beaule, Catherine Christoffersen, Natalie Sutt-Wiebe
- Editors - Stephanie Cairns, Sonia Cyrus Patel, Natalie Sutt-Wiebe
- Roadmap to a circular economy in Canada - sector-specific, focused on agri-food
- Growing global demand for food requires increased production, but one-third of existing food production is wasted (in Canada, this number increases to 58%, roughly 30% of which is avoidable)
- In terms of environmental impact, a quarter of global greenhouse gas emissions can be traced back to the agri-food industry
- Most food waste in Canada occurs in manufacturing, at households, and in processing
- Cities could also play a leading role in reducing food waste by sourcing their food from nearby local producers, conducting consumer-based education programs, and supporting rooftop urban farms
- The global benefits of urban initiatives such as these could be immense ($920 billion in economic benefits, carbon dioxide equivalent reduction by 4.3 billion tonnes by 2050)
- Objectives of a circular food economy
    - Reduced resource consumption
        - Ecodesign - scale up low-carbon, energy-efficient farming - establish zero-waste grocery (stores and delivery) to eliminate packaging/food waste from the food supply chain
        - Process optimization - shorter supply chains to ensure that food supply does not exceed food demand (with this in mind, aim for more accurate consumer demand forecasting), resulting in reduced transportation requirements - strengthen food waste/yield trackers, quality control - build infrastructure to preserve fruits and vegetables that might otherwise be left to rot - proper storage for food inventories to prevent spoilage
        - Responsible consumption and procurement - campaigns to raise consumer awareness of food waste - discounts for expiring food -

procurement of sustainable food - introduction of new labels ("best if used by" for quality purposes, "use by" for safety purposes) as well as storage advice on packaging

- Intensified product use
  - Sharing economy - promote platforms that would connect consumers looking to share a food surplus in the household, cooperative supermarkets
- Extending the lifespan of products
  - Food recovery - encourage retailers to donate or resell surplus food as a way of diverting it from landfills (could waive liability for businesses as an incentive for them to donate food)
  - Performance economy - encourage the use of subscription services like HelloFresh which could reduce food surpluses by proportioning ingredients
- Giving resources new life
  - Industrial ecology - establish agro-industrial parks which would combine agriculture with small-to-medium scale industrial production
  - Recycling and composting - for example, Guelph's green bin program, which captures 32% of organics and diverts them from landfill
  - Energy recovery - reappropriate waste and transform it into new products like fabrics, or capture it and turn it into green sources of electricity or biofuels - nutrients can also be diverted from wastewater for use as fertilizer

- Relevant local examples - Provision Coalition (based in Guelph, helps food companies implement sustainable practices in a profitable manner), Re-Imagine Food Campaign (awareness campaign in Guelph to educate the public on food waste/promote the benefits of a circular food economy), Green Bin Program in Guelph (allows 32% of organics to be diverted from landfill), Lystek (company contracted by the city to convert biosolids into liquid organic fertilizer)

KFW Research Articles

Summary prepared by Pollinate Networks Inc.

2021/07/21

Interactive learning or R&D: How do small and medium-sized enterprises generate innovations?

- How do SMEs generate innovations? Research typically focuses on R&D and how dedicated research departments generate new "scientific-technical knowledge" (STI mode) - there is also the "doing, using, and interacting mode" of innovation (DUI

mode), in which practical and experiential knowledge gained from day-to-day production and interaction accumulates

- Based on a survey of firms with fewer than 500 employees which had introduced product/process innovations recently, the researchers identified three different types of innovators
    - Innovators specialising in industry expertise - these firms acquire practical knowledge from suppliers, trade fairs, and trade publications, rather than using knowledge from the sales market - firm culture generally does not encourage collaboration for innovation purposes and management is unwilling to take significant risks - innovation expenditures are low and there is very little in-house R&D in these firms, so these innovators fall under the DUI mode of innovation - overall limited innovation activity - these firms represent roughly 20% of the sample - they are typically smaller SMEs, usually construction/retail firms, and staffed primarily by non-graduates
    - Sales market-oriented innovators - these innovators also conduct only limited amounts of R&D, but there is more innovation activity here, drawing on customers, informal collaboration/cooperation within the firm, and organizational error management - informal interactions especially help to develop the practical knowledge of employees which can then be drawn on for innovation purposes - these innovators also largely fall under the DUI mode of innovation - these firms represent roughly 42% of the sample - they are typically medium SMEs, not concentrated in a particular sector but generally also staffed by non-graduates
    - Innovators combining the STI and DUI mode - these innovators combine aspects of the DUI mode, gaining knowledge from external providers (especially research institutions) as well as through more formal collaboration/cooperation channels (made possible since these firms are often larger), although they also conduct in-house R&D - these firms represent roughly 38% of the sample - they are typically larger SMEs, usually manufacturing/service firms, and mainly staffed by university graduates
- Innovation policy must not therefore invest solely in R&D, they must also support the diffusion of innovations to firms that don't perform in-house R&D

SMEs between financial resilience and a digital and green investment surge – a trade-off that should not be:

- T infrastructure/applications, workflow reorganization, digital integration of different departments, introduction of digitized products/services
- Ad-hoc digitalization has taken place due to COVID and the need to keep businesses operating but longer-term investment has yet to take place
- SME investment to achieve a climate-neutral economy - transition to renewables, energy efficiency improvements, energy saving measures - businesses are increasingly aware of the benefits of energy-saving innovations (lower energy costs)

- Policy-makers must provide incentives - uncertainty reduction for those that provide capital, financing costs reduction for SMEs
- Incentives for digitalization - increase the supply of IT expertise, Internet connectivity, greater access to digital markets, greater protection against cybercrime, exemption from liability, interest rate reductions, research grants, greater supply of private capital
- The effect of COVID on SME investments - 35% of SMEs which began 2020 with plans for investment reduced/deferred these plans, while 18% of SMEs abandoned these plans completely - this has disrupted increasing SME investments which took place after the Great Recession
- These investments were concentrated in the service sector, a sector which has taken the brunt of the impact from COVID
- Even before COVID however, SME investments in "equipment, industrial buildings and other facilities" have been declining
- Although most SMEs (in Germany at least) had built up high levels of equity since the 2000s, the cost of high turnover due to COVID has cut into this
- Many SMEs also expect to deal with greater indebtedness, having had to take out loans, but most of them are still on stable footing
- Opportunities for increased investment - digitalization and the transition to a climate-neutral economy - need to incentivize and put a framework for investment in place since these transformations will be critical for the future - a lack of investments in these areas will render businesses uncompetitive
- Barriers to digitalization investment for SMEs - data protection/security requirements, lack of in-house IT, poor Internet connectivity, difficulty of predicting return on investment
- Nature of digitization efforts - digitalization of customer contacts

Incentives for transition to climate-neutral economy - rising carbon pricing to help support climate-friendly businesses (although carbon pricing must be harmonized globally - in the absence of that, there must be compensation for businesses that compete internationally).

Business Needs Assessment: Detailed Categories

Business Need Areas	Specific Needs
Changes	Fewer layers of bureaucracy
	Improved equity of access to food aid
	Community involvement in the food system
	Centralization of food system support services
	Fair compensation for food products
	Advocacy for a more equitable/circular/local-oriented food system
	Greater food security
	Food that is of a higher quality/fresher
Commercial Relationships	Access to local suppliers, retailers, other partners
	Greater buying power
	Easier access to capital
	Access to local suppliers, retailers, other partners
	Greater buying power
	Easier access to capital
	More funding
	Matching business needs to existing services that are currently available
	Consumer access to local producers
	Access to local suppliers, retailers, other partners
	Distribution support
	Greater buying power
	Aggregation of local supply to decrease the risk for large-scale buyers like restaurants
	More funding
	Easier access to capital
	Delivery of local foods (perhaps through some kind of e-commerce platform)
Information and Knowledge	Easier access to technical information/resources -- i.e., either to OMAFRA (which has downsized its outreach) or the Uof G
	Consumer education
	Business training/ education courses
	Help with marketing/financing/other business services
	Easier access to technical information/resources -- i.e. either to OMAFRA (which has downsized its outreach) or the Uof G

Business Need Areas	Specific Needs
	Consumer education
	Business training/ education courses
	Help with marketing/financing/other business services
	Help making operations more circular (i.e. connections with local partners who produce or are in need for waste)
	More accurate data about food insecurity
	Business assistance for scaling up
	Shared resources/knowledge
	Consumer education
	Permanent staffing at a food hub to ensure consistency and sustainability
	Curriculum to equip food business owners/food stakeholders with necessary skills
	Research and development assistance
	Business assistance for scaling up
	Access to accurate information and facts
	Help with marketing
	Help making operations more circular (i.e. connections with local partners who produce or are in need for waste)
	Help navigating regulatory landscape (traceability standards, food safety, labelling requirements, etc)
	Curriculum to equip food business owners/food stakeholders with necessary skills
	Mental/emotional support for food entrepreneurs due to the difficulties of starting up a food business
Information and Knowledge & Commercial Relationships	Collision space for networking and increased access to business expertise/knowledge/funding sources
	Collision space for networking and increased access to business expertise/knowledge/funding sources
Labour	Increased access to labour
	Increased access to labour
Physical Assets	Storage space
	Increased processing capacity
	Access to tech/equipment
	Storage space
	Increased processing capacity
	Access to tech/equipment
	Co-packing
	Increased innovation and piloting/product development capacity

Business Need Areas	Specific Needs
	Space for public-facing food events
	Access to farmland/commercial space for manufacturing
	Storage space
	Logistical support/access to a warehouse
	Increased processing capacity
	Co-production space
	Co-packing
	Access to tech/equipment