CURRENT PROFILE AND INNOVATION PLAN FOR THE INDIGENOUS AGRICULTURE AND AGRI-FOOD SECTOR

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LUMINARY

Advancing Indigenous Innovation for Economic Transformation, Employment and Wellbeing

IndigenousWorks

Presented by

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Advancing Indigenous Innovation for Economic Transformation, Employment and Wellbeing

Executive Summary

The story of the Indigenous agriculture and agri-food sector requires a new telling so that the full accomplishments of years' past, and future opportunities ahead are fully understood and shared not only among Indigenous people but with non-Indigenous businesses, governments, and other organizations.

An impediment to growth is that the sector currently lacks the baseline and documentation needed to advance development, planning, and strategy formation. This document will contribute to filling in some of the information gaps and providing planning requirements. This report examines and also includes a plan to help develop the conditions needed to increase Indigenous-led research and innovation partnerships in this sector.

Sectoral trends and product segments are reviewed as to what they mean for Indigenous people and businesses engaged in the Indigenous agriculture and agri-food sector. Indigenous development of the agriculture and agri-food sector has the potential for two distinctive future pathways.

1. There is the possibility of commercial development and there is a nascent Indigenous business community that can contribute to this growth. That said, the commercial aspects of the industry lag due to historical reasons and so incremental measures are needed to capture and address imbalances and move the sector forward. Research and innovation can be a catalyst to growth and wellbeing.
2. A second pathway focuses on growth of a more traditional nature. Themes include the re-discovery of traditional agricultural-based economies, some of which were flourishing well before 'first contact.' This pathway could include a better understanding of subjects such as heritage crops and the cultural aspects and importance of Indigenous agricultural activity. This pathway is about food nutrition and the restoration of mind, body, and spirit. It is about community gardens and displacing imported packaged foods with locally grown foods which promote micro-enterprises and wellbeing.

Fifteen recommendations are provided in the report which stem from Indigenous Works / Luminary's completion of the profile of the Indigenous agriculture and agri-food sector and derive from the many discussions with Luminary partners and other interests. There are two kinds of recommendations, the first focuses on general development initiatives which will benefit the agriculture and agri-food sector. The second set of recommendations focus on ways of increasing Indigenous-led research and commercial innovation partnerships.

1. The sector requires an Indigenous human resource plan to ensure that young Indigenous people are receiving the skills, learning, and credentials needed to enter the workforce. This means more Indigenous enrollment in post-secondary institutions and training for the 'future' workforce needs of the sector.
2. It is important that support be provided to build and sustain the institutional structures that are important and needed for sector growth. An Indigenous industry association, an Indigenous human resource organization, a business association are just a few examples. The roles and purposes of such organizations are varied and can include advocacy, industry representation, strategy building and facilitation, and other roles.
3. A policy dialogue is needed with Indigenous businesses and NGOs / government agencies to identify strategies by which to increase their leverage of procurement opportunities within the agriculture and agri-food sector. The goal is to better understand the policy supports needed to: (1) increase Indigenous commercial diversification to grow agriculture and agri-food products and services, and ;(2) build capacity among Indigenous businesses so that they are better positioned to respond to procurement opportunities under the federal government's five-percent Indigenous Procurement Target.
4. It is recommended that a strategy be developed for post-secondary institutions to increase Indigenous enrollment particularly in the education programs offered by the thirteen Canadian Faculties of Agriculture, Food and Veterinary Medicine. This includes undergraduate enrollment and graduate studies and could include the formation of new chairs and/or academic positions in areas of agriculture, food, and veterinary medicine that align with Indigenous strategies for growth in these areas.
5. The Indigenous agriculture and agri-food sector would benefit from further exploration about its brand and what it means for consumers, investors, stakeholders, and producers.
6. The formation of Knowledge Networks is encouraged for Indigenous businesses to gain a better understanding of the business opportunities within the sector. The compilation of industry intelligence and information needs more organization and ways of improving dissemination and accessibility. The Indigenous agriculture and agri-food sector needs to create the systems of exchange to improve access, grow, and mobilize knowledge to encourage innovation.

7. A comprehensive plan is needed to address the lack of data about Indigenous engagement in the agriculture and agri-food sector. The lack of such data is a major obstacle to the development of an Indigenous vision.
8. It is recommended that further research be undertaken to develop and design a labelling system for biocultural heritage-based products.
9. The adoption of research and innovation curricula and an awareness program is needed to increase Indigenous-led research and innovation partnerships in the Indigenous agriculture and agri-food sector.
10. Research and documentation are needed to further promote sustainable Indigenous Food Systems. A central pillar to food security and food sovereignty for Indigenous communities is investing in agriculture and agri-food processes that prioritize sustainability. The regenerative agriculture approach not only values environmental sustainability but also socio-economic sustainability in the form of wellbeing, skills development, and stable employment opportunities for community members.
11. A comprehensive sector ecosystem mapping needs to be completed. The sector lacks the organization and systems needed to match Indigenous businesses to the wide range of organizations that have funds and expertise to offer to Indigenous businesses to develop and commercialize new products and services.
12. It is recommended that a plan is developed to attract Impact Investors to the Indigenous agriculture and agri-food sector. In the current period with government budgets becoming more depleted due to the cost of Covid responses, and other priorities, it is important that new sources of capital be identified to invest in the growth of the sector.
13. There is an industry-wide discussion needed to plan for Indigenous agriculture and agri-food product and market expansions and the policy supports needed to support such expansions. In this discussion it is recommended that the model developed by the US Intertribal Agriculture Council and its *Native American Indian Foods* program be given serious consideration as a basis for a similar program for Canada's Indigenous agriculture and agri-food sector.
14. There are many product categories that offer promise within the Indigenous agriculture and agri-food sector. These need to be nurtured because they are new, they are under-developed, or they offer further opportunity for growth, and align with global demand trends. Incremental work is needed to support these sub-segments.
15. More programs are needed to address the engagement gap between Indigenous small and medium businesses and large (non-Indigenous) corporations operating in the agriculture space. Large companies need 'playbooks,' and information to assist their engagement strategies. They lack cultural knowledge which affects their ability to identify and develop trusting relationships with Indigenous businesses. There are insufficient partnerships between Indigenous businesses and corporations in the agriculture and agri-food sector. In addition to formal partnerships (e.g., joint ventures) there is a need for other kinds of collaborations such as knowledge sharing, marketing, and product development (partnership) arrangements.

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The project was developed by 'Luminary' which is the name that Indigenous Works has given its initiative to design and implement an Indigenous innovation strategy leading to economic transformation, employment, and wellbeing. Luminary works with its 150+ partners to close the research gap between Indigenous business and community economic priorities and post-secondary research institutions. This project in the agriculture and agri-food sector is the first by Luminary to focus on a specific sector of the Indigenous economy.

Contents

Introduction

The story of the Indigenous agriculture and agri-food sector requires a new telling so that the full accomplishments of years' past and future opportunities ahead are fully understood and shared not only among Indigenous people but with non-Indigenous businesses, governments, and other organizations. It is an exciting collection of stories full of promise and important because of their connection to Indigenous lands, culture, and history. Indigenous entry and growth in the agriculture and agri-food sector is part of a larger narrative about the rise of Indigenous economies. For example, Carol Anne Hilton, a modern economic philosopher, and founder of Indigenomics talks about the goal of the $100 billion Indigenous economy.[1] Where and how could the Indigenous agriculture and agri-food sector contribute to that economic growth?

An impediment to growth is that the sector currently lacks the baseline and documentation needed to advance development, planning, and strategy formation. This document will contribute to filling in some of the information gaps and providing planning requirements. The Indigenous players and influencers in this sector remain hidden because of the lack of documentation which explains which businesses and organizations are engaged, what and how they contribute, and what direction they see themselves moving in the future.

Apart from the description of the sector provided here, we also identify at a high level what issues and opportunities Indigenous companies and organizations see for the future. We will consider what the potential areas are for a research agenda for the Indigenous agriculture and agri-food sector in the future. The report also identifies a plan for increased Indigenous innovation in this sector. Through Indigenous Works' Luminary initiative, we have had the benefit of learning from Indigenous businesses, post-secondary research organizations, government and other organizations about the conditions that need to be put into place to increase Indigenous-led research and partnerships for commercial innovation.

Indigenous businesses are engaged and contributing new energy and outlooks to the ways that agriculture and agri-food is being developed in Canada. There is a long and important history to Indigenous participation in agricultural activity and we are continuing to learn more about these early traditional activities as the work of Indigenous archeologists and historians continue to reveal some comprehensive developments and accomplishments from years past. At the same time, a new generation of Indigenous commercial agriculture and agri-food businesses are emerging who are interested in reshaping and bending the sector to their own needs for purposes of jobs, economic development, and wellbeing.

This is the balance in the storyline in the description of the sector. There are two intertwining narratives. On the one hand, there is the story of a long Indigenous agricultural tradition and how today there is a rediscovery of past economies and cultural connections which underscore the importance of traditional foods both culturally and economically. The other part of the profile's description and narrative focuses on the importance and opportunity afforded by further development and the potential for increased commercial innovation in this sector. In this second storyline we ask how scientific and other research can be stimulated to create new knowledge about the sector and how this knowledge can be used to create new products, markets, or other value creation. This too is the forward-looking story that needs to be told.

A final note, the emphasis in our narrative is on Indigenous people in Canada. However, we continue to learn of the work that Native American businesses and organizations are doing south of the border. We will see in a few cases that there is similar development when comparing the United States and Canada. There is strong interest in north/south dialogue and the knowledge transfer that can ensue. So too, opportunities for global exchange and trade among Indigenous people working in this sector need to be encouraged, just as community-based and local product/market orientations also need to be nurtured.

[1] In 2021 RBC Financial reported that Indigenous businesses contributed $30 Billion to the Canadian economy so an increase to $100 Billion would be transformative. See more about Indigenomics at www.indigenomicsinstitute.com

Preliminary Remarks About the Sector

Indigenous development of the agriculture and agri-food sector have the potential for two distinctive future pathways.

1. There is the possibility of commercial development and there is a nascent Indigenous business community that can contribute to this growth. That said, the commercial aspects of the industry lag due to historical reasons. Read about the negative impacts of the Canadian government's Peasant Farm Policy for example.[2] Consequently, incremental measures are needed to capture and address imbalances and move the Indigenous agriculture and agri-food sector forward. Research and innovation can be a catalyst to growth and wellbeing.
2. A second pathway focuses on growth of a more traditional nature. Themes include the re-discovery of traditional agricultural-based economies some of which were flourishing well before 'first contact.' This pathway could include a better understanding of subjects such as heritage crops and the cultural aspects and importance of Indigenous agricultural activity. This pathway is about food nutrition and the restoration of mind, body, and spirit. It is about community gardens and displacing imported packaged foods with locally grown foods which promote micro-enterprises and wellbeing.

There are elements of each pathway that are shared with the other. Indeed, modern Indigenous commercial and industry development is looking for ways to integrate cultural values and expression into growth frameworks. The value of delineating the pathways is to better understand the needs of the Indigenous communities, businesses and organizations that are part of each (or both) pathways.

Sectoral Growth Should be Premised on Indicators of Wellbeing

At the heart of the goals for self-determination, nation-building, and sovereignty is the premise that Indigenous people want to attain a quality of life and prosperity in alignment with their own cultural outlooks, values, and ideas about seven generations. This thinking is holistic and shaped by Indigenous philosophies about the environment, the land, and the inter-relationships that exist in the world. This vision varies from community to community and there are distinctions-based interpretations.

The definition of both socio-economic and wellbeing end-goals will fundamentally inform on the Indigenous policies, investments, and institution-building that are needed for the development of the agriculture and agri-food sector, as well as other sectors of the Indigenous economy. The ability to chart the progress toward nation-building, sovereignty and wellbeing will be a way to bring unity of direction and stronger collaborations. It is not just about achieving a *bigger* Indigenous agriculture and agri-food economy. It is about achieving a particular kind of economy and sector in alignment with Indigenous philosophies and outlooks about the state of wellbeing. We have also established that there are two very different visions about Indigenous agriculture and how and why it should be pursued.

Food Sovereignty and Food Security Are Paramount Concerns

Food sovereignty highlights the need for democratic food systems, ones that involve inputs from citizens as well as producers. Food sovereignty is rooted in grassroots food movements. Food security is concerned with the protection and distribution of existing food systems. One study recently found that food insecurity affects 41% of First Nations households living on reserve in British Columbia.[3]

[2] From 1889 to 1897, the Canadian government's Peasant Farm Policy set limits on Indigenous agriculture on the Prairies. The policy included rules about the types of tools First Nations farmers could use on reserve lands. It also restricted how much they grew and what they could sell. The Peasant Farm Policy was built on the belief that Indigenous farmers had to gradually evolve into modern farmers. It also reduced these farmers'ability to compete with settlers on the open market. The policy ultimately impeded the growth and development of First Nations farms. As a result, First Nations never realized their agricultural potential. Article by Doug Cuthand, The Canadian Encyclopedia, May 21, 2021.

[3] Steiner L, Neathway C. 'Indigenous Food Safety and Security: Community Adaptations in The Wake of Climate Pressures. Vancouver, BC: National Collaborating Centre for Environmental Health. 2019 Feb.

Readers are encouraged to review the Food Secure Canada Discussion Papers as part of the policy initiative on Resetting the Table: A People's Food Policy for Canada. This excerpt is from the paper on Indigenous Food Sovereignty. [4]

'The trends occurring amongst Indigenous peoples are the beginnings of a new Indigenous food sovereignty. By establishing projects under their own leadership, Indigenous peoples are determining what should be grown, cooked, taught, and shared. In time, these decisions will pave the way for greater food security.

Part of Indigenous food sovereignty is to reclaim traditional Indigenous foods. For many Indigenous people growing, gathering, and preparing the foods that were passed down through the generations was devastated through colonization and assimilation. But Indigenous food traditions are resilient and knowledge keepers have maintained the links between the land, the people and food. Today, efforts to re-establish food traditions is an important part of Truth and Reconciliation, food security and food sovereignty.[5]

A person is food insecure if they do not have access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. This could mean that they can't afford a balanced diet, they miss meals, or do not eat for days at a time. For Inuit, it can also mean that they don't have access to country foods from the land which are central to their culture and way of life.[6]

Inuit Tapiriit Kanatami (ITK) the national Inuit organization in Canada released their Inuit Nunangat Food Security Strategy on July 12, 2021. 'The high rate of food insecurity for Inuit in Canada is unacceptable,' stated Natan Obed, President of ITK, during the July 12 news conference in Ottawa.[7]

A 2017 Statistics Canada report, 'The Insights on Canadian Society: Food Insecurity Among Inuit Living in Inuit Nunangat', put together from data in the 2012 Aboriginal Peoples Survey, found that it costs between $328 to $488 per week for a four-person family in an isolated Inuit community to provide a healthy diet, while in southern Canada, it would cost $209 for a family of four.

Authors Delormier & Marquis (2018), discuss the deep connections that Indigenous people have with the food they have been able to grow in the past. The ability to cultivate and grow their own crops served needs that were important for survival and cultural identity. They use the example of the Haudenosaunee teachings and their creation story and the 'three sisters' of agriculture technique (to grow corn, squash, and beans together) thereby creating a micro-environment framework for cycle planting and food sovereignty. The Kahnawake community's schools include agriculture in their curriculum and the community has a seed library. They plant between 600-2000 food bearing plants during a 5-year period. 'Food is a connection to the specific places and spaces wherein Indigenous peoples draw their identity.'[8]

A few regional Indigenous organizations are developing food security or food sovereignty strategies. One example is Kwayeskastasowin Wahkohtowin: A 2050 Food System Vision for Treaty Four Territory.[9] The author states how the current policies are reducing grasslands. The main areas where critical changes are needed are, environment, diets, economics, culture, technology, and policy. These changes will contribute to a better future in food sovereignty, healthier lifestyles, and a focus on education in traditional Indigenous knowledge transfer.

A second example is about food security in urban centres.[10] Authors Cicero and Martens conducted research in 2014 that showed Indigenous people in the city suffer from food insecurity and desire sovereignty. In Winnipeg, for example, traditional food skills workshops have been delivered through a partnership between the North End Community Renewal Corporation (NECRC), the North End Food Security Network (NEFSN), and the Indian and Métis Friendship Center (IMFC). These workshops provide skills for Indigenous food sovereignty with focus groups held after the workshops.

[4] Food Secure Canada Kitchen Table Talks (People's Food Policy Project 2009-2011). Paper # 1 on Indigenous Food Sovereignty.
[5] For more about Indigenous Cuisine visit https://indigenousworks.ca/sites/default/files/attachments/Indigenous_Cuisine.pdf
[6] Inuit Tapiirit Kanatami https://www.itk.ca/inuit-nunangat-food-security-strategy
[7] Trevor Wright, 'ITK Lays Out Food Security Strategy for Inuit.' Nunavut News, July 12, 2021.
[8] Treena Delormier & Kaylia Marquis, 'Building Healthy Community/Relationships Through Food Security and Food Sovereignty', Current Developments in Nutrition, Volume 3, Issue Supplement_2, August 2019, Pages 25–31 pp 30.
[9] Hanley, 2020. 'Evisioning a 2050 Food System for Treaty Four Territory', Canadian Bahá'í News Service, 17 November 2020, https://news.bahai.ca/en/articles/envisioning-a-2050-food-system-for-treaty-four-territory.html
[10] Cicero & Martens, 'Traditional Food Upskilling as a Pathway to Urban Indigenous Food Sovereignty', 2015.

Sector Organization is Weak

The Indigenous agriculture and agri-food sector lacks organization and visible national sectoral leadership although these building blocks to growth are beginning to emerge. There are currently few formal associations or organizations that have been established that can speak on behalf of Indigenous representation in the sector. The lack of strong national Indigenous institutional presence in the agriculture and agri-food sector in Canada is a barrier to growth.

Regional and community-based strategies are more prevalent as evidenced by the formation of several food sovereignty and food security strategies that are being developed by some Treaty Groups and in Nunangat but there remain many gaps and connections between key stakeholder businesses and organizations that if better developed could be critical to the growth and advancement of the sector. There is no overarching national development or industry plan for the Indigenous agriculture and agri-food sector as there is for the non-Indigenous Agriculture sector.

There are Indigenous leaders among specific agriculture and agri-food operations, but the sector lacks the national leadership needed to chart a common course for the future. The Indigenous agriculture and agri-food sector lacks documentation and there are few sources to consult to get a broad overview of what is happening in the sector and where the are opportunities. Omid Mirzaei PhD at the University of Regina's School of Economics concurs. He notes that 'the lack of baseline data has been an obstacle to effective engagement of Indigenous communities with the agriculture sector'.[11]

Improvements Needed in the Research and Innovation Ecosystem

In 2021 and 2022 Luminary brought together 150 representatives who affirmed the view that Indigenous research and innovation ecosystems are loosely knit in most sectors of the Indigenous economy. Some pointed to an exception and noted the many achievements in the Indigenous healthcare sector which has grown institutional ties and developed bridges between healthcare research and community healthcare needs. There are excellent examples of knowledge networks developed in Indigenous healthcare which are fortifying the healthcare ecosystem. An example is the Canadian Institutes of Health Research (CIHR) which funds the Institute of Indigenous Peoples' Health (IIPH) and established the Indigenous Mentorship Network Program (IMNP) to advance the research agenda to improve the health of Indigenous peoples in Canada, to strengthen research networks, to facilitate capacity exchange for Indigenous health researchers, and to ensure systemic growth in research capacity and development.[12]

That said, even with these advancements in the healthcare sector there has not yet been the same push in knowledge mobilization so that Indigenous businesses are able to make use of research knowledge for purposes of commercial innovation. We have not yet seen advancements in an Indigenous healthcare industry with Indigenous businesses developing increased healthcare products and services due to increased emphasis on Indigenous healthcare research, improved access to that new knowledge, and the introduction of more sophisticated mobilization systems and practices that benefit the Indigenous business community.

In comparison, the Indigenous agriculture and agri-food sector has an even looser knit research and innovation ecosystem than what we are seeing in sectors like healthcare. The agriculture and agri-food sector is far from creating the conditions needed to spur on Indigenous-led research and mobilization including opportunities for commercial agri-business innovation. Absent are the Indigenous-specific research hubs, the research facilities, and systems for disseminating and mobilizing new research knowledge so that Indigenous businesses can grow product and service innovations. That said, there do exist some lab-to-market type networks and innovation facilities that are trying to service Indigenous communities for agriculture and agri-food purposes however, several of these facilities express challenges achieving engagements with Indigenous businesses.

Later in this report we identify what is needed to create the conditions for increased Indigenous-led research and innovation partnerships in the Indigenous agriculture and agri-food sector. By way of further introduction to this topic, it will be stated that among many requirements, Indigenous people are expressing a need for long-term research relationships with post-secondary institutions built on trust, respect, and mutual interests. Dedicated funds and approaches are needed for community outreach and relationship-building to lay further groundwork so that research can start. This is an important first step towards improving the performance of the Indigenous research and innovation ecosystem.

[11] Omid Mirzaei, 'Mapping Indigenous Engagement in the Agriculture Sector in Canada', 2022. https://indigenousworks.ca/sites/default/files/attachments/Indigenous_Engagement_in_the_Ag._Sector.pdf

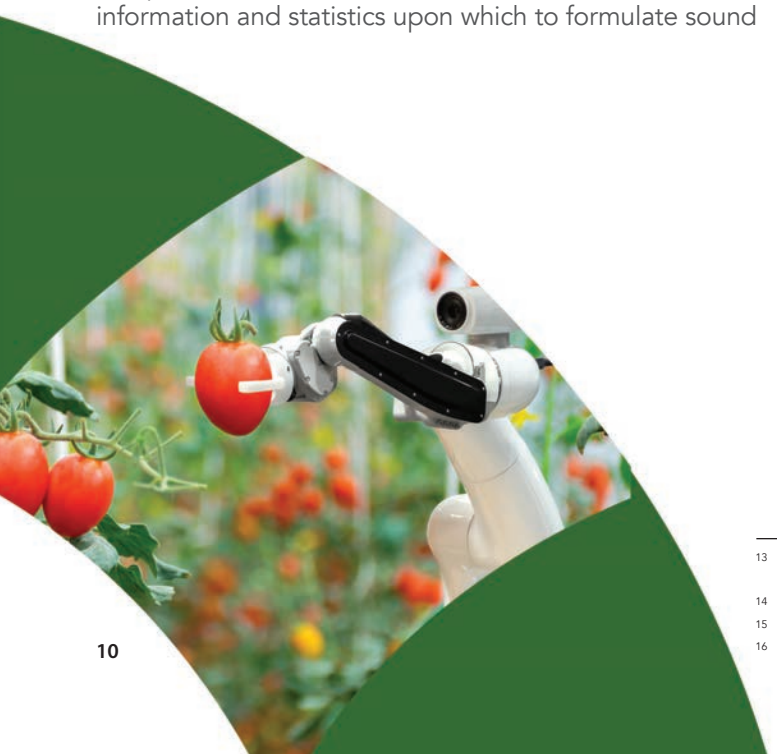
[12] https://cihr-irsc.gc.ca/e/49453.html

Public Policy and Build Back Better

As we emerge from the worst of the Covid pandemic, there is a compelling drive to 'build back better' on so many levels. An investment *now* in the Indigenous agriculture and agri-food industry and business innovation could spell dividends in the future. Acknowledging the pockets of success with Indigenous businesses and communities, and their participation in the Canadian economy in sectors such as agriculture and agri-food, Indigenous peoples and communities in Canada remain in a fragile state with the metrics showing little upward trends. In their recent report on Indigenous Economic Progress (2019), the National Indigenous Economic Development Board examined a comprehensive range of socio-economic indicators. They note that '… there are some (very modest) positive trends and improvements in specific markets and communities across Canada. However, no substantive changes have been made in the main socio-economic gaps which characterize Indigenous circumstances today.'[13]

An encouraging development is a new National Indigenous Economic Development Strategy for Canada: Pathways to Socio-Economic Parity for Indigenous Peoples (2022).[14] This is the first such document of its type planned and developed by a coalition of Indigenous organizations. The strategy features 107 Calls to Economic Prosperity and provides a road map for the country to achieve economic reconciliation.

Looking at the policy and regulatory regimes in agriculture and agri-food, the current frameworks offer only modest support for Indigenous people to grow their engagement in the sector. Noted earlier are the policy shortfalls to facilitate Indigenous access to capital, agri-business start-up, and technical assistance. Land use and land leverage remains cumbersome under the current regimes and compared with other countries there is an overall lack of information and statistics upon which to formulate sound policy foundations for Indigenous participation in the sector. Current regulations and policies tend to favour larger scale commercial agriculture, and it has become difficult for rural and remote Indigenous agri-businesses and communities to navigate these regulatory regimes. The regime for animal processing and meat safety certification is an example. Communities that want to harvest and sell 'country foods' face incremental challenges because they are remote and unable to access the certification regimes.



Environmental Issues and Climate Change

Indigenous peoples' concepts of sustainability are attracting more interest from academic, business, and government institutions that want to explore how these concepts and learning can broaden western policy and research paradigms. The relationships Indigenous peoples have historically had with the land are expressed in language and concepts which are very different to western conceptions.

The Royal Commission on Aboriginal Peoples reflected on the special relationship of Indigenous peoples to the land and its resources: a relationship that is at once, '… both spiritual and material, not only one of livelihood, but of community and indeed of the continuity of their cultures and societies.'[15] From this perspective, land is not understood exclusively as an economic commodity or an economic asset, but it is also considered a critical part of the expression of Indigenous nationhood, identity, and culture.

Indigenous people see in some segments of their modern economies, greater possibilities for development in alignment with their values and outlooks. An example is Indigenous clean energy initiatives which have been on the rise in the last five years in Indigenous communities. In 2019, Indigenous participation was advanced in one hundred and fifty-two (152) medium-large scale solar, wind, hydro, and bio-energy clean energy projects now in operation. It is projected that an additional fifty to sixty medium-large renewable energy projects with Indigenous participation will come online over the next five to six years.[16]

The vast storehouse of traditional knowledge provides many opportunities for the development of sectors of the economy in ways which are uniquely Indigenous. The knowledge, definitions and shaping of sectoral growth is premised on concepts that Indigenous people have developed for their environment and their desire to protect and safeguard it. It is these values which help explain the unique fast-tracking that clean energy is experiencing in Indigenous communities and among businesses.

[13] National Indigenous Economic Development Board, 2019 Indigenous Economic Progress Report, 2019.
[14] https://niestrategy.ca
[15] Royal Commission on Aboriginal Peoples, Volume 2, Part 2, page 438
[16] https://indigenouscleanenergy.com

Climate changes and other environmental concerns and stressors will continue to grow and Indigenous people and communities have unique food cultures that are very much connected to place, geography, and local customs. Climate change thus poses a unique threat to Indigenous peoples. The flip side of this are the opportunities for growth and development.

Access to Capital

According to the National Indigenous Economic Development Strategy for Canada 'access to capital is ranked as the most significant barrier to business growth. First Nations and Inuit businesses continue to access proportionally less capital than non-Indigenous businesses in Canada. To help address these challenges, successful Indigenous-led innovations have been developed. Notably, among these, are the national network of Aboriginal Financial Institutions (AFIs) and the institutions created under the First Nations Fiscal Management Act (FNFMA), and in particular, the First Nations Finance Authority (FNFA).'[17]

More research is needed to better understand the varied motivations that different segments of impact investors may have toward investment decisions concerning Indigenous agriculture and agri-food. The term impact investing was formally coined in 2007. The core concept of impact investing is the notion of making financial investments with the intention of generating positive social and environmental impact alongside a modest financial return. The term impact investing is new, but it builds on a long history of global communities pooling and sharing financial resources to improve outcomes for people and the planet.[18]

An Aging Sector Offers Opportunities

The agriculture and agri-food sector accounts for 6.7% of Canada's GDP or $111.9 billion and employs approximately 2.3 million people. Of those employed in the industry, the agricultural (farm) population is 592,575 people of which 15,765 individuals (2.7%) self-identify as Indigenous persons. Agriculture and agri-foods like many sectors of the Canadian economy show an aging workforce.

The average age of Canada's farm operators increased by 1.0 year, to 56.0 years in 2021. Meanwhile, the median age of farm operators rose by 2.0 years from the previous census, reaching 58.0 years in 2021. The Indigenous population was 8.2 years younger, on average, than the non-Indigenous population overall. Just over one in six working-age Indigenous persons (17.2%) were "close to retirement" (55 to 64 years), compared with 22.0% of the non-Indigenous population.[19]

The proportion of farm operators aged fifty-five and older (older operators) grew by 6.0 percentage points from the previous census. In 2016, 54.5% of operators were aged fifty-five and older, increasing to 60.5% in 2021. Conversely, Canada's share of young operators was 8.6%, down slightly from 9.1% in 2016.[20]

These statistics mean that companies in the agriculture and agri-food sector that are looking for people to hire should be focusing on the Indigenous population as a source of talent. The challenge for many non-Indigenous companies is that they lack an understanding of the Indigenous labour market, and they may not have the organizational strategies, practices, or readiness to hire from the Indigenous talent pool. Non-Indigenous businesses are encouraged to work with the network of 110 Indigenous Employment and Skills Training (ISET) Program organizations funded by the federal government whose job it is to work with employers to develop and place Indigenous people into jobs and careers. The ISET program is explained further on the federal government's website.[21]

These days skilled occupations are in high demand. Unfortunately, Indigenous enrollments in agriculture post-secondary institutions continue to be low, and there will be strong competition for those who have the right skills. Employers who have entry-level positions and can train up new employees may be better positioned to hire from the Indigenous talent pool.

In summary the agriculture and agri-food sector lacks an Indigenous workforce attraction strategy and non-Indigenous businesses lack culturally appropriate attraction and recruitment plans. Whole new employment strategies are needed to attract and recruit Indigenous people to the sector.

[17] National Indigenous Economic Development Strategy for Canada: Pathways to Socio-Economic Parity for Indigenous Peoples (2022)
[18] Harvesting Wealth: Using Impact Investing to Grow the Indigenous Agriculture and Agri-Food Economy prepared by Rally Assets, 2022 https://indigenousworks.ca/sites/default/files/attachments/Harvesting_Wealth.pdf
[19] Stats Canada 21.09.2022
[20] Stats Canada 2021
[21] https://www.canada.ca/en/employment-social-development/programs/indigenous-skills-employment-training.html

The Circular Economy and Closed Loop Systems

Closed loop systems can be a part of the circular economy model that focus on making production processes as sustainable, efficient and waste-reducing as possible. Any waste that is a biproduct of the production process is reintegrated into the loop or used in the broader bioeconomy in this model of economic production. The circular economy approach also considers the social benefits of sustainable production processes through incorporating skills development of workers into production systems and economic development.

'Circular solutions are an inherent feature of Indigenous societies, not just with the economy but also in society and the environment," explains Dakota Norris, of the Gwich'in First Nation (WCEF, 2021).[22] Indigenous traditional knowledge and living within ecological boundaries are often credited as important components of the circular economic model. Valuing the importance of what people add to the production process through their labour is a core component of this model. It holds significant potential to address food security, sustainable resource management and job creation through bio-based knowledge systems.[23]

Digital agriculture can play a vital role in circular agriculture as it enables producers to monitor and regulate inputs in a more precise way which helps reduce waste, spoilage, and match demand with supply. Precision agriculture can be used alongside regenerative agricultural techniques that seek to preserve the integrity of the natural system by practicing crop rotation, minimum or no-till, and cover cropping. Remote sensing and real-time environmental data can optimize crop yields while reducing ecological externalities. Livestock and crop production can be linked to create nutrient loops in a mixed agriculture system. Vertical farming, hydroponics and aquaponics are other approaches that can act as the anchor of a close looped food system and can be integrated with other approaches to food production.[24]

Technology Use is Becoming More Pervasive

The Fourth Agriculture Revolution includes organic, sustainable, urban, regenerative, and digital approaches to agriculture. Digitizing agriculture is critical to the future of agriculture and helps farmers and producers optimize operations and profits and to access more accurate, timely data so they can make more informed decisions. It also supports more efficient and sustainable food production with fewer inputs and reduced waste.

Digitization of agriculture is being embraced around the world and Canada is poised to be a leader in this area. It is being used in aquaculture to detect water contaminants and disease in shellfish, and in vegetable production (potatoes and lettuce) regarding water usage and reducing levels of nutrients (potassium) that can have negative consequences for people with a chronic illness such as kidney disease.[25]

There are a few barriers to digitizing agriculture in Canada. It boils down to the financial ability and digital knowledge of producers.[26] Digital agriculture is still relatively new, costs are high, and details of long-term benefits are rarely available. Widescale adoption will require collaboration and consensus to determine the best way of overcoming these obstacles. It will also require skills development and training for current farmers and growers and future workers in the agricultural sector. Special attention must also be paid to how the goals of the food and knowledge sovereignty of First Nations, Métis and Inuit and the food security goals of Indigenous communities across Canada are addressed as food production becomes more digitized.

Despite the promise of a digitized future of food production, there are ongoing challenges that require systemic action. Connectivity (broadband access) is an ongoing challenge for rural Indigenous communities. Only 24% of households in Indigenous communities have access to quality high-speed internet. This is a significant stumbling block as we move towards a digitized agricultural sector. In addition, there is no consensus on how to protect IP rights and this is especially important for the protection of traditional knowledge of Indigenous communities. Data and knowledge sovereignty must be a cornerstone of efforts to digitize Indigenous agriculture. Sharing platforms must be secure and IP rights regarding traditional knowledge and agri-foods must be enforced and monitored.

More Emphasis Needed on Innovation

Indigenous people have a long history as innovators. However, in the way that innovation is measured in the Canadian business context, both Indigenous and non-Indigenous businesses in Canada fall behind in 'commercial' innovation. Every year, the Global Innovation Index (GII) created by Cornell University, INSEAD and the World Intellectual Property Organization ranks the innovation performance of 130 economies around the world. In the 2019 GII study, Canada ranked seventeen out of one hundred on the Global Innovation Index. Switzerland, Sweden, and USA ranked 1 to 3, respectively. But what would Canada's placement be if we were just looking at Indigenous businesses? It would be significantly lower, more like the rankings of some emerging countries such as

[22] Norris is also a representative of the Indigenous people on Canada's Sustainable Development Advisory Council.
[23] Elia et al., 2017; Velasco-Munoz et al., 2021
[24] www.agriorbit.com
[25] http://breakthrough.unglobalcompact.org
[26] www.challenge.org

The Republic of Malawi, which scored 118.[27] Like in Malawi, the conditions to encourage commercial innovation among Canada's Indigenous business community are lacking.

Intellectual Property Has Become More Important

Mercedes Campi provides background about the changes in intellectual property laws affecting the agriculture sector in recent years. 'Intellectual Property Rights and Agricultural Development: Evidence from a Worldwide Index of IPRs in Agriculture (1961-2018)'.[28] Recent decades have witnessed a global process of strengthening and harmonizing intellectual property rights (IPRs) systems.

Market competition between large-scale industrial production of wild rice and small-scale wild rice operations have encouraged a debate over whether lake-harvested wild rice could benefit from intellectual property law, which in theory could protect the legacy of wild rice, as well as the genetic diversity of wild rice species that are socially, culturally, and economically important in Indigenous groups in the Great Lakes Region. In a paper published by Sara Desmarais (2019), she investigates the viability of pursing geographical indication for wild rice in the Great Lakes Region to help revitalize wild rice ecosystems, discussing the benefits and challenges of this approach to protecting wild rice.[29]

A Brief Tour of the Sector

Several of the sub-sectors where Indigenous people are currently working have their origins in their own traditional economies. These historical connections to food and commerce are highly important in their influence of Indigenous development of a modern agriculture and agri-food sector. One marvels at the level of agricultural activity which took place in the years before first contact and in the period prior to the Indian Act coming into power in 1876. Examples of Indigenous engagement in sub-sectors of agriculture and agri-foods are cited in this section of the report.

Maple Syrup

Maple sugar and syrup were a staple among many Indigenous communities. Archival research has shown that many Indigenous peoples would drink sap, sugar, or syrup as a remedy for numerous body ailments. Maple production was, and still is, very much engrained within the ceremonies, spirituality, and culture of many Indigenous communities. The maple harvest season is known for ceremony, celebration, and spiritual connectedness as it signals the survival of winter and the coming of new life through the spring season.

> *"Sinzibuckwud' is the Algonquin name for maple syrup. The literal translation is "drawn from the wood".*
>
> – Gwen Tuinman, 'Maple Syrup: A Sweet Lesson from the First Nations', https://gwentuinman.com

The significance of this industry is supported by archival research recently conducted by the Huron who have done a review of documents indicating that during the 1800's, the Indigenous communities of Manitoulin Island exported over half a million pounds of maple sugar yearly. However, by 1890 beet and cane sugar became popular and less expensive, dissolving the mass demand for trade of maple products. This change boosted the reputation of maple syrup and maple products as a luxury item.[30]

Today, the Canadian Maple syrup industry is on a growth curve with export markets showing opportunities for the future. The industry is well organized and there is a robust research network and expertise to guide new development opportunities. There are a wide range of Indigenous-owned businesses that are currently involved in the maple syrup industry. Many capitalize on the long associations that Indigenous people have had with maple syrup and these traditions and stories are incorporated into marketing narratives to differentiate their product lines.

Québec Maple Syrup Producers (QMSP's) lead and direct the International Maple Research and Innovation Network which contributes to QMSP's Maple Research Program. QMSP has invested over $9 Million in some seventy research projects and developed an international network of renowned scientists dedicated to learning more about maple from Canada, including the many health benefits of its ingredients and compounds.

[27] Cornell University, INSEAD, and WIPO (Soumitra Dutta, Bruno Lanvin, and Sacha Wunsch-Vincent Editors), Global Innovation Index 2019: Creating Healthy Lives - The Future of Medical Innovation, Ithaca, Fontainebleau, and Geneva. 2019. It is noted that Canada has managed to tilt the balance in its favor in 2022 by becoming more productive in converting innovation inputs into outputs, making a 'comeback' into the GII top fifteen.

[28] Mercedes Campi, Alessandro Nuvolari, 'Intellectual property rights and agricultural development: Evidence from a worldwide index of IPRs in agriculture (1961-2018)' Institute of Economics, Laboratory of Economic and Management Working paper series. Scuola Superiore Sant'Anna, 2020/06 March 2020 ISSN(ONLINE) 2284-0400.

[29] https://llj.lakeheadu.ca/issue/view/87

[30] Moody, Hayley, "Indigenous Knowledge and Maple Syrup: A Case Study of the Effects of Colonization in Ontario" (2015). Social Justice and Community Engagement. 12. https://scholars.wlu.ca/brantford_sjce/12

Agriculture and Agri-Food Canada (AAFC) has been conducting research on the flavour of maple syrup since 1998. A partnership between the Food Research and Development Centre located in Saint-Hyacinthe, Québec, and the Centre de recherche, de développement et de transfert technologique acéricole inc. (Centre ACER) which is in Saint-Norbert-d'Arthabaska, Québec has been establishing ways to characterize the taste of maple syrup.[31]

The development of a flavour wheel helped the industry rate maple syrup other than by its colour and defects. The maple flavour wheel was developed to express the taste of the syrup in all its nuances and describe the extensive spectrum of flavours of maple products made in North America. Thanks to the maple syrup flavour wheel, maple syrup industry stakeholders can use a common language to describe both the quality and variety of flavours of maple products. The entire industry now has an innovative tool to present maple products to Canadian and foreign consumers. This is a further illustration of the role that research can play to grow product and market opportunities.[32]

Giizhigat Maple Products (GMP) is a First Nations business established 2012 in Ontario making maple syrup on St. Joseph Island. The name Giizhigat (gee-jaa-gut) in Ojibwe translates to Day. To date, Giizhigat Maple Products produces and sells maple syrup. They also sell maple butter, maple candies and maple sugar.

Berries

Non-Timber Forestry Products (NTFPs) such as a variety of berries have been traditionally harvested for subsistence and income across North America by Indigenous peoples. Berries are highly valued by Indigenous communities and other forest food harvesters as a source of income, food security and tradition. Foraging for forest foods is an adaptable way to achieve food security in the boreal forest.

The types and varieties harvested by Indigenous peoples vary across the continent. Drupes, pomes, Saskatoon's service berries, blueberries, huckleberries, gooseberries, currants, blackberries, raspberries, strawberries, cloud berries, salal berries, crowberries, cranberries, cherries, wild plums, grapes, elderberries, soapberries, and thimbleberries are examples of berries harvested by Indigenous groups across North America.

Traditionally harvested for personal and community use, berries are also used as ingredients in food products (jams, energy bars) and personal care products. Berries are also used in tourism-related services across North America to highlight berries' cultural importance to Indigenous peoples' cultures, traditions, and food security.

There are numerous examples of economic activity in the berry sector across North America. The Passamaquoddy and other Wabanaki Tribes have harvested wild blueberries for centuries. The Pasamaquoddy Wild Blueberry Company located in Maine is one of the largest wild blueberry farmers in the world and since 1981, it has partnered with industry leaders. Another example is the Red Lake Band of Chippewa located in Minnesota which has a company called Red Lake Nation Foods. It is a food manufacturing company that produces fruit jellies and jams using locally sourced berries.

In addition to manufactured agri-food products, Joella Hogan of the Na-Cho Nyak Dun First Nation in the Yukon owns and operates the Yukon Soaps Company from her home in Mayo. Her artisanal soaps are made with foraged products spruce tips, juniper berries and wildflowers. She says that her soap making is 'a way to reconnect our people to the land.' She is passionate about preserving her Northern Tutchone culture and being a steward of the land.

In addition to the manufacturing of commercial products, other Indigenous groups have used berries to create services to showcase traditional foods. Kevin Eshkawkogan the CEO of Indigenous Tourism Ontario sees using food and drink to encourage Indigenous food tourism in Northern Ontario.

[31] Agriculture and Agri-Food Canada and see the (French only) website for Centre Acer at www.centreacer.qc.ca
[32] https://indigenousworks.ca/sites/default/files/attachments/Maple_Syrup.pdf

There have been numerous projects to provide financial resources to support the creation of agribusinesses and create Indigenous employment opportunities. Natural Resources Canada's (NRCan) Indigenous Forestry Initiative has funded several projects related to NTFPs designed to support the growth of Indigenous-owned businesses. The Timiskaming First Nation in Québec has received funding to gather, process and market a number of NTFPs including highbush cranberries. The focus of this project is to emphasize Indigenous community building competitive business models using traditional knowledge of the forest ecosystems. The Waswanipi First Nation in Québec has also received funding from NRCan to support the acquisition and launch of Ungava Gourmande, an Indigenous-owned and operated business focused on using NTFPs in wild food jellies derived from fruits and plants.

In summary, innovations in this sector include a wide range and use of berries combined with other ingredients to create commercial jams, personal care products, and other value-added offers. Food tourism has expansion possibilities as well. Partnerships with other companies and/or organizations (e.g., Indigenous Tourism Ontario, Indigenous Tourism Canada, Natural Resources Canada) is growing in terms of ways to get harvested berries into the commercial sector, while respecting traditions and cultural significance of foraged foods.[33]

Research and Innovation in the Seaweed Industry

Nuu-chah-nulth Seafood (NCN) is a First Nation owned seafood enterprise that operates on Vancouver Island's West coast. Nuu-chah-nulth Seafood has partnered with Cascadia Seafood Company to cultivate seaweed. The Nuu-chah-nulth owned enterprise had already been exploring opportunities around the commercial cultivation of seaweed through research projects with North Island College when the newly formed aquaculture company, Cascadia approached them.

The Food and Agriculture Organization of the United Nations reports that the global seaweed industry is worth more than $10 billion USD of which some 85 percent comprises food products.

In 2019, Cascadia Seaweed and Nuu-chah-nulth Seafood seeded an initial crop of several hectares yielding approximately ninety tons of kelp in June of 2020. This was followed by an expansion to twenty hectares and further growth. Cascadia Seaweed is in discussion with food and industrial product companies to determine the highest value-added outcome. This will include a focus on leveraging the tremendous nutritional components of kelp, as well as its value in products such as alginate, cosmetics, and other industrial uses.

In the food sector alone, there has been tremendous interest in the use of plant-based proteins as a replacement for some food groups. Kelp and many seaweeds in British Columbia can provide an important and abundant source of vitamins, minerals, and other nutrients for this burgeoning sector. On a global scale, the World Bank predicts that seaweed farming has the potential of adding about 10% to the world's present supply of food over the coming decades.[34]

Canada has an abundance of sea plants on all three coasts, but little has been done to develop this resource. Indigenous people have a unique relationship with their coastal environment and specialized traditional knowledge about seaweed. It will be important to bring together Indigenous people and organizations to further explore the potential for an Indigenous seaweed industry. What do Indigenous people envision as a future for this industry? What governance structures should be developed to underpin the growth of this industry and what environmental safeguards are needed to ensure that growth is sustainable? There are many questions that require exploratory dialogue to establish foundational principles for development.

An industry plan is needed based on the foundational principles adopted. The plan needs to identify an appropriate policy framework to guide the industry, and partnerships will be required to promote the ecosystem needed for research and development. There is considerable potential, and Indigenous people need to be the drivers. We need to better understand the investment and infrastructure needs and dialogue is needed to explore these opportunities.

[33] More about berries and other non-timber forestry products https://indigenousworks.ca sites/default/files/attachments/Berries.pdf

[34] https://www.cascadiaseaweed.com/partnership-with-nuu-chah-nulth-seafood-lp

Looking Back and Forward at Wapato

The wetland Wapato is also known as the Indian potato. Wapato is a geophyte ('root food') that is part of the Alismataceae, or water plantain family. In coastal British Columbia, Wapato populations were concentrated in the Pitt Lowlands prior to European contact. Historically, Wapato flourished particularly in the Katzie homelands and was avidly sought in exchange by communities throughout Coast Salish territory to the extent that it has been called a cultural keystone species. Trade between nations flourished as Wapato were exchanged and traded.[35]

Beginning 3800 years ago and continuing for at least seven hundred years, the Katzie First Nation located on the Fraser River Delta were the commercial farmers who mass produced Wapato's wild tubers. The ancestors of contemporary Coast Salish (Katzie) people fell into a deep and mutual love with Wapato, building a life to accommodate their collective desires and needs, and sustained their knowledge and appreciation of Wapato through hundreds of generations and today, this knowledge is being applied through experimental research and ecological restoration in Katzie territory.

Research has revealed the cultural and economic importance of Wapato to the Katzie First Nation. Could the tuber find a new place in the modern agri-food industry as a branded product with both domestic and export potential? More research and development work are needed to address this question.

Pulses and the Three Sisters

The global pulse industry is booming in response to the growing demand for plant proteins. The category of pulses includes dried peas, lentils, dry beans, and chickpeas. Legumes such as soybean and canola and oilseeds are not included in the pulse category. The global market for pea proteins for example, was estimated to be worth 130 million (USD) in 2019. Canada, specifically Saskatchewan, is a leading producer in pulses for the global market. Most pulses produced in Saskatchewan and across Canada are exported (86%) to places such as India, China, and Bangladesh.[36]

The growing demand for pulses is partially due to the rising number of individuals shifting their preferred dietary protein source from animals to plants - aka 'meat reducers' - primarily for ethical, environmental and/or health considerations.[37] Conversely, improving living standards of global populations have increased demand for animal products (as some cultures associate the consumption of animal-based proteins with higher disposable incomes and affluence), which has increased the demands for pulses used as animal feed. The versatility of using peas as protein sources in processed foods is also a driver of sector growth. Pea proteins, which are industrial extractions from yellow peas, are easily digestible, have low allergenicity and are high in dietary fibre. They can be used in value-added food products including meat substitutes, cereals, beverages, baked goods, sports drinks, dried pastas, energy bars and much more.[38]

Despite the importance of pulses (specifically beans) for traditional Indigenous peoples' diets across the continent, currently there are few Indigenous-owned pulse operations geared toward commercial sale, or enterprises primarily focused on value-added pulse products. Large-scale corporate actors dominate all aspects of the pulse value chain, from seed to sales. Small-scale enterprises do exist, as do multi-stakeholder efforts focused on encouraging Indigenous involvement in this sector as demand continues to grow. However, these efforts are still in their infancy, and it is unclear how Indigenous groups can participate in global supply chains that rely heavily on large-scale, mechanized monocultural production. It may be more likely that small-scale production focused on local food economies has potential as a path forward for those who wish to grow pulses. Alternatively, there are some prospective options in the value-add segment of the supply chain in terms of developing pulse-based food products for the commercial market.

Many varieties of beans have been cultivated across North America for around five thousand years. Beans have historically been grown by Indigenous communities on a small scale typically in a mixed-agriculture (intercropping, milpa agriculture) setting. Indigenous peoples have planted maize, squash, and beans together. The companion planting of these three crops is commonly called the 'Three Sisters' approach. The maize grows first, providing a stalk for the beans. The squash plant grows low to the ground, shaded by the beans and corn, and keeps the weeds from affecting the other two plants. When planted side by side, these three crops are mutually supportive, resulting in better yields at harvest in a small space (compared with large-scale, export-led monoculture).

There is renewed interest in examining the Three Sisters model to determine how it can be reintroduced into some communities, to contribute to food security. This approach to food production is in stark contrast to the large-scale, industrial production models that dominate the global pulse industry today, yet it is an approach that can contribute to multiple goals of food and nutrition security, food sovereignty and sustaining traditional knowledge in Indigenous communities interested in engaging in small-scale, mixed agriculture.

[35] Dr Tanja Hoffman, 'Katzie & the Wapato: An Archaeological Love Story,' Journal of the World Archaeological Congress (© 2018) https://doi.org/10.1007/s11759-018-9333-2
[36] www.saskpulse.com
[37] Clark and Bogdan, 2017
[38] www.gminsights.com

Wild Rice

Wild rice, or 'manomin,' provides many opportunities for Indigenous people to advance their agricultural interests. Manomin continues to be harvested on a small scale by Indigenous groups across Canada and the US, on and off reserve. Whether harvested by hand on a small-scale or by mechanical harvesters on a larger scale, manomin is a highly nutritious staple grain that has sustained the Anishinaabe and Ojibwe for thousands of years. It is what Tea Horse co-owner Denise Atkinson calls, 'the amazing North American superfood'.[39]

North America is expected to dominate the global wild rice market with relatively high growth rates as demand for wild rice continues to climb. This market growth presents economic opportunities for Indigenous communities to enter the expanding market locally and globally.[40]

Indigenous communities across Canada and the US use wild rice for spiritual, ceremonial, and cultural applications, household consumption, community consumption, and as an economic revenue stream.[41] Unfortunately, traditional ricing beds in some areas have been decimated by industrial pollutants, flooding, and climate change, however re-seeding is underway to contribute to Indigenous food security and sovereignty and to rehabilitate damaged waterways and lakes. "It is too early to describe what restoration looks like on the Winnipeg River – but, it is not too early to dream of (re)seeding an Indigenous crop, teaching youth how to care for their plant relations, and, by so doing, revitalizing "cultural keystone places" for the practice and transmission of Anishinaabe ecological knowledge," states Anishinaabeg historian Brittany Luby, author of *Dammed: The Politics of Loss and Survival in Anishinaabe Territory (2020)*. Re-establishing, further developing and scaling up manomin beds and ideally harvesting yields for the commercial market has the potential to increase employment opportunities on- and off-reserve, while contributing to economic growth in the community and the region.

Although innovations in manomin production and harvesting have been developed and applied over time by Indigenous peoples, communities are finding new ways to scale up in the manomin sector. Value-addition activities like 'The Anishinaabe Wild Rice Experience' link traditional knowledge with experiential activities that contribute to a broader awareness of the importance of the 'Good Berry' to Indigenous peoples' cultures, food security and community wellbeing while also contributing to regional economic development. Value-added food products containing wild rice, such as dried soup mixes and pastas, are also part of an emerging market for wild rice and present an opportunity for Indigenous communities wishing to commercialize wild rice harvests. [42]

Part of the growth in demand for wild rice is consumer interest in ethical and/or environmentally sustainable 'food from somewhere,' a concept closely linked to the Slow Food Movement. Consumers are also motivated to purchase foods that 'have a story,' making effective communication of the origins and the traceability of wild rice an important marketing tool for current and future Indigenous enterprises. Effective branding and trademarking can offer some protection for the intellectual property of Indigenous peoples (though this Western legal concept applied to Indigenous foods is contested and rejected by some). It can also help to differentiate Indigenous owned and operated wild rice businesses from paddy rice that is industrially harvested.

Examples of Indigenous businesses currently operating along the wild rice supply chain include producers, processors, food manufacturers, marketers, and distributors.

- Flying Wild Rice Co. harvests its manomin from Trout Lake in Ontario. It uses authentic harvesting processes without additives or preservatives. The manomin is gathered from traditional Indigenous territory and seeks to continue the traditions of ancestors who harvested and lived off manomin for thousands of years.[43]
- Black Duck Wild Rice, located near Pigeon Lake, Ontario, is a company owned and operated by Curve Lake First Nation member James Whetung. After consulting with community Elders, James replanted traditional gathering grounds. In addition to gathering the traditional way, Black Duck also gathers wild rice using airboat and processes the wild rice into food using home-made machines. In addition to selling harvested wild rice, Black Duck Wild Rice operates workshops for visitors to experience the practices of wild rice gathering.[44]

[39] www.northernontario.travel.ca
[40] www.futuremarketinsights.com
[41] www.nativeharvest.com
[42] www.futurefoodsystems.com
[43] www.flyingwildrice.ca
[44] www.blackduckwildrice.net

- La Ronge Wild Rice Corporation is one of two wild rice processing plants in Saskatchewan. It has several stakeholders, including Lac La Ronge Indian Band, Meadow Lake Tribal Council and Peter Ballantyne Developments, to name a few. Before the local processing plant was constructed, the harvest would be shipped to Manitoba or the U.S. The provincial government invested in establishing the processing plant as a source of local employment and income generation for the community. The Lac La Ronge Indian Band established Northern Lights Foods to market and distribute wild rice (it has since been sold to Can Am Construction.

What has been key to the re-establishment of lake wild rice beds is the involvement of the research community.[45]

Value-Added Foods

In 2019, the Canadian government gave $250,000 to Economic Development Regina as part of the Western Development Program and a regional strategy to add value to the agri-foods industry in and around Regina. The goal was to use this money to create and implement a strategy on the agri-food industry in the Regina area with a focus on plant proteins. (Then) Minister Ralph Goodale emphasized the importance of investing in value added products using plant proteins.[46] Economic Development Regina is working with File Hills Qu'Appelle Developments (FHQ), an Indigenous development corporation. FHQ's goal is to work with Indigenous communities that would benefit from the strategy and focus on commercial partnerships.

Though large-scale pulse investment is underway in terms of collaborative projects between the established pulse sector and Indigenous communities, there are other research activities focusing on small-scale mixed models of food production using beans as companion crops. Part of the current research project is to document, preserve and protect traditional knowledge associated with food production, namely the Three Sisters model. Building seed libraries containing traditional varieties of beans, squash, and maize that are accessible by Indigenous community members is also an important component of food sovereignty and protecting the intellectual property of Indigenous groups. Preserving seeds for future generations also supports food production that includes (but is not limited to) pulses.

Other examples of value-add in the plant protein segment include snack bars, dried seasoned lentil snacks, dried soup mixes, spreads, and dips. An example of a Canadian-made value-added food product using pulses is the Local Bar. The Local Bar is a snack bar made of ingredients sourced in Saskatchewan by Oluason Food Products, co-owned and operated by Saskatchewan-based Oluason sisters. Ingredients include lentils, flax, quinoa, and honey. It is pressed into a snack bar that includes protein and fibre.[47] Though not an Indigenous enterprise, the Local Bar provides a good example of how pulses grown in Canada can be used in value-added products. Indigenous enterprises could combine traditional foods in a similar way, such as wild rice, berries and dried Odawa beans for example. The Tanka bar (mentioned in the section on berries) is an Indigenous enterprise using traditional ingredients and combining them in a bar form. Unlike the Local Bar, the Tanka Bar contains traditional Indigenous food ingredients like bison meat.[48]

Readers are encouraged to look at the marketing work of The Intertribal Agriculture Council (IAC), a United States Native American organization founded in 1987 to promote the conservation, development, and use of American Indian agricultural lands to benefit American Indians. The IAC promotes the 'Made/Produced by American Indians' trademark. The trademark is used to clearly identify American Indian made products from federally recognized Tribes and Alaskan Native Villages. IAC began the process to develop and create the trademark in 1991 shortly after the passing of the Indian Arts and Crafts Act (Acts) of 1990 (P.L. 101-644), which encourages the use of legally registered trademarks to ensure authenticity of Indian made products. The development of the trademark was part of a grant funded by the Administration for Native Americans. It was formally approved in 1993. The American Indian Foods Program was established in 1998 by the IAC.[49] This marketing model could be adapted to Canadian Indigenous value-added agri-food products. The model provides a way for smaller companies to achieve marketing reach and exposure.[50]

[45] More on wild rice https://indigenousworks.ca/sites/default/files/attachments/Wild_Rice.pdf
[46] Schick, 2019
[47] Shultz, 2016
[48] Cram, 2016
[49] www.indianag.org/americanindianfoods
[50] To view the American Indian Foods Program presentation in full, go to this landing page at https://indigenousworks.ca/en/luminary/advancing-innovation-strategy-indigenous-agriculture-and-agri-food-sector

In Pursuit of Fungi

Mushrooms and their by-products provide an almost infinite variety of opportunities for Indigenous people to advance their agricultural interests. Whether harvesting naturally occurring mushrooms or developing cultured mushrooms on a small, medium, or large scale, versatile fungi offer a food that is high in protein, easy to grow and harvest, and part of a growing market that will only get better and better.

Fungi mycelium has critical properties that provide nutrients for soil and play an important role in the ecosystem. The mycelium of fungus refers to the fragile root-like fibers of fungus that live underneath the ground. Mycelium is 100% organic, compostable, and biodegradable. When it is dried, it becomes incredibly durable and resistant to water, mold, and fire.

Mushrooms have been harvested by Indigenous peoples across North America for thousands of years and they have long connections to the practices and end-uses that have been developed. There is a deeply appreciated and sophisticated knowledge about the use of mushrooms in traditional foods, medicines, and as a part of rituals. This traditional knowledge is an important source of intellectual property for Indigenous people to develop and use today as they best see fit. Many Indigenous communities understand the effects of mushrooms and there is a market for this knowledge and the products that could be produced. The marketing of chaga teas is an example.

Mushroom farming has potential for growth. Rather than harvesting mushrooms at certain times of the year, mushroom cultivation offers the possibility of year-round production which can be scaled and can be done on a micro scale or on a big commercial scale. But even the smallest enterprises offer significant opportunities for Indigenous people and communities.

By far the biggest growth areas in the world of Fungi has to do with value-added products and services. Our review of the literature suggests that Indigenous communities and businesses are not yet exploring these new opportunities to the extent they could be pursuing. Examples of value- added products include mycelium leather, building materials and many others. Mushroom cultivation offers opportunities for local Indigenous food production and small business ventures which will provide supplementary income for people or community enterprises. Value-added fungi products and services have yet to be tapped by Indigenous entrepreneurs. More invention and business development would be welcome. [51]

Agricultural Opportunities for First Nations in Fiber Production

Saskatoon-based Fiber experts Paul Arnison and Alvin Ulrich see opportunities for Indigenous groups to compete profitably in cultivation and/or processing of fiber containing plants.[52] There are various opportunities with the cultivation of fiber producing plants that deserve further discussion and consideration. There are numerous opportunities for Indian Hemp fiber (Apocynum cannabinum) that include biodegradable fishing line and nets and fabrics for a variety of applications including ceremonial or cultural articles such as "Friendship bags". Presently, there is no known commercial production of Indian hemp.

Ancestrally, the plant would have been collected from the wild. Although it would take many years to fully domesticate Indian hemp, trial sized production should be straightforward. There are also additional related underutilized species that produce fiber. These genetically related species to Indian hemp are commonly known as milkweeds. There is a company in Québec already using the milkweed seed floss as a substitute for duck and goose down in jackets, quilts, pillows and as a natural fiber oil spill absorbency product. Such milkweed plants also have strong fibers in the stems like hemp or flax, but they have not been exploited commercially although it appears they could be processed on the same machinery as that used to extract fiber from flax stems. In addition to fibers, these plants make a milky white latex sap that has many applications and seeds that have unusual oil properties.

A summary of some of the possible opportunities is as follows:

Indian Hemp:

a) Biodegradable fishing line and nets, nets for fruit trees, extremely long and strong fibers.
b) Woven fabric for ceremonial and cultural articles such a Friendship bags.
c) Latex, used to make chewing gum.

Related Milkweeds:

a Versatile fibers for many applications.
b) Latex, for gloves and rubber like products.
c) Soft fibers, fluff as an insulator in clothing (replace goose down) and as an oil spill absorbent.

[51] Full article on mushrooms https://indigenousworks.ca/sites/default/files/attachments/In_Pursuit_of_Fungi.pdf
[52] Presentation on fibre opportunities https://indigenousworks.ca/sites/default/files/attachments/Webinar_12-14-2021_Presentation_on_Fibres.pdf

Current Fiber Crops

Flax:

a) Fibers for many purposes (like hemp but fiber is finer so higher end uses like clothing (i.e., linen) is much easier than with hemp.
b) Industrial oils for paints etc.
c) Edible seed.

Hemp:

a) Fibers for industrial purposes such as in erosion control, landscaping, wall and ceiling insulation, replacement of glass fiber in "fiberglass" plastic composite products.
b) Coarser textiles.
c) Oil and edible seed.

Indigenous Shellfish Culture

Geoducks, lobster, quahogs, oysters, clams, crab, shrimp, and scallops, shellfish are natural filters for the water they are in. They are a clean, sustainable choice for aquaculture. First Nations people of Canada have been aware of the benefits of shellfish for 14,000 years and shellfish 'gardens' have been found as old as 3,200 years.

Glucosamine, the chitin found on shells of certain shellfish has healing properties that are used in some medicines as well as in foods and used in paper. The potential market for chitin includes industrial, food, nutraceutical, pharmaceutical, and biomedical applications. Glucosamine is even found in certain cosmetic products as a skin-replenishing ingredient.

Some examples of Indigenous entry into the shellfish industry are as follows:

- In 2011, Coastal Shellfish was established with a multi-million-dollar investment from the Coastal First Nations Great Bear Initiative and other partners. They built a shellfish hatchery in Prince Rupert, British Columbia (BC) and it is combination of nine BC nations and their focus is on Great Bear Scallops.
- Sipekne'katik First Nation recently bought Clearwater Seafoods, a global leader in fisheries. 'The Mi'kmaq will have full ownership of Clearwater's coveted offshore fishing licences, which allow the harvest of lobster, scallop, crab and clams in a massive tract of ocean known as LFA 41'.[53]

There are many examples of collaborations between the shellfish industry and researchers at post-secondary institutions.

- Currently, PEI is the largest producer for mussels in North America (Indigenous and non-Indigenous together). However, with such a production of mussels, disease is also at its highest peak and the mortality rate of mussels is extremely high. Research is currently being conducted through a breeding program.
- Dalhousie University in Nova Scotia also conducts research into shellfish in aquaculture. Research spans different kinds of shellfish from oysters and clams to mussels, lobsters, and urchin. They have teaching labs as well as wet labs.
- North Island College in British Columbia, in partnership with Rising Tide Shellfish, has constructed and field tested a new oyster grow-out system which requires less labour than standard grow-out trays.
- 'Gratitude' is an Indigenous brand that originates from Nuu-Cha-Nulth in British Columbia. Their core values are sustainability, health, community, and gratitude - all the traditional hallmarks of Indigenous people. This Indigenous-owned cannery and smokehouse enterprise provides shopping online. Their focus is mostly on salmon however they also sell prawns, a shellfish source great for protein, selenium, phosphorus, vitamin B12 and E. Along with all their many great different choices, they also supply seafood pet food.
- Pentlatch Seafoods, owed by the K'omoks First Nation in British Columbia, became incorporated in 2004 and has just over sixty-four hectares in aquaculture for geoducks, muscles, scallops, cockles, and abalone in the shellfish industry. This company alone has launched millions of shellfish seeds in their aquaculture ecosystem.

Sipping Success: Wineries, Distilleries and Breweries

Though overall this industry is dominated by large, multinational corporations, the number of Indigenous-owned and operated enterprises in this category is growing in Canada.

As networks of Indigenous wine, beer and spirits enterprises further establish themselves, there are opportunities to build community in this industry and to also promote, share, and celebrate what Indigenous enterprises bring to the table. The enterprises profiled here have created unique offerings that come with knowledge that is tied to their land and people. Several use their place of business

[53] Full Leyland Cecco, 'We won': Indigenous group in Canada scoops up billion dollar seafood firm', 12 November 2020, The Guardian www.theguardian.com/environment/2020/nov/12/canada-clearwater-seafoods-mikmaq-first-nation-fishing

as a platform to educate outsiders about their culture and traditional knowledge, while introducing them to new methods and traditional flavours.

Canada's wine making industry consists of establishments focused on manufacturing wine or brandy from grapes and other fruit. This includes establishments engaged in growing grapes, manufacturing wine (from grown and purchased grapes and other fruit), blended wines, making cider or distilling brandy.[54] Though Canada is not listed in the top ten wine producing countries, it is home to over 480 establishments, mainly situated in British Columbia and Ontario.

'Now, people come to our reserve. They travel from Europe, and Calgary, and Vancouver, specifically to come to our reserve — which still sounds kind of weird…Our little resort here, the cultural centre, the winery, the campground, the whole little experience built all around us. People come here to see our land.'

– Justin Hall, Nk'Mip Cellars, 2019

- Indigenous World Winery (IWW) established in 2016, is owned by former Westbank First Nation Chief Robert Louie and his wife, Bernice. The concept for the winery came about as the Louies' way of linking the terroir of the land and Indigenous people's stewardship of the land. The winery is a stop on the Westside Wine Trail that weaves through the greater Kelowna area and is a gateway to the South Okanagan in British Columbia. IWW produces eleven varietals and four blends of wine, in addition to vodka and gin. Four of the wines carry labels using the Nsyilxcen language, spoken by the local Syilix people. The gin includes a traditional bitter root used by the Syilix for thousands of years called spiƛm (pronounced speetlum).[55]
- South from Indigenous World Winery is the widely known Indigenous winery, Nk'Mip Cellars (pronounced ink-a-meep) located in the Okanagan Valley in British Columbia, established in 2002. In 1968, members of the Osoyoos Indian Band agreed to allow outsiders to build a vineyard with a future vision of building the community's economy. Nk'Mip is North America's first Indigenous winery that is a component of a destination resort in Osoyoos. Nk'Mip is majority owned by the Osoyoos Indian Band in partnership with the Canadian wine company Arterra Wines Canada, Inc. The Band owns 51% of the winery and leases out some of the land for other purposes. There are several related businesses on Osoyoos Indian Band land that have brought economic opportunities to the community, including the Spirit Ridge resort, a spa, golf course, restaurants, and the Nk'Mip Desert Hills Cultural Centre. 'We're really growing the entire region,' Hall says. 'getting people back to our land'. [56]
- Though British Columbia has the highest concentration of wineries in Canada, Ontario now has its first Indigenous winery. Caldwell First Nation (also known as the Chippewas of Point Pelee) did not sign the 1790 McKee Treaty and was the only band in Southern Ontario that did not have its own reserve land. In 2010, the Caldwell Nation signed an agreement with the Canadian government and land around Point Pelee was purchased. The Caldwell First Nation also bought a restaurant and a marina outside of Point Pelee Park, near Leamington. Kyra Cole, Caldwell's economic development officer, says the winery, restaurant and marina will be at the centre of a development plan focused on experiential tourism. She says, 'we are going for sustainability…Experiential tourism is small-scale yet profitable…people crave a genuine cultural experience and Indigenous communities want to tell their story' (May, 2020).

Experiential tourism is a feature of many wineries that brings outsiders to tribal lands. It provides an opportunity for outsiders to learn about the customs and culture of the community as defined by the community. It can generate economic benefits for community members and can provide the opportunity for Indigenous communities to tell their own story reflecting their own perspective and experiences.

- Manitoulin Brewing is located on Lake Huron Island in Little Current, Ontario. It was founded by friends Nishin Meawasige, Blair Hagman and Joet Dhatt in 2014.[57] It does not self-identify as an Indigenous business

[54] www.agr.gc.ca
[55] www.indigenousworldwinery.com
[56] Rooke, 2021 - Canada's Indigenous wineries thriving in the face of adversity - https://crushmagazine.ca/category/winery-industry-news/
[57] www.manitoulinbrewing.co

however media profiles of the company label it as partially Indigenous owned, as Meawasige is an Indigenous person. Measwasige grew up in Whitefish River First Nation. Manitoulin Brewing prioritizes hiring and training local band members to staff the brewery. The brewpub offers food that uses local ingredients sourced from Indigenous producers on the island. The menu includes whitefish (an island specialty), venison and fresh locally picked vegetables. The brewery plans to expand its menu to include more traditional Indigenous foods and intends on collaborating with Wikwemikong First Nation to create a cider from locally grown apples. [58]

- Kahnawake Brewing Company is located on the Kahnawake First Nation in Québec and was established in 2016. It is the first microbrewery in the area co-owned by Andrew Stevens, Frank LeBlanc (a retired steelworker) and Matt Deer. At the time, Québec did not have regulations on the books covering brewing on reserve. As such, the Mohawk Council of Kahnawake and the Alcoholic Beverages Control Board had to pen new legislation to create laws around beer manufacturing on reserve land.[59] The idea for a microbrewery started with the iconic black bridge in the area (named after the Saint Laurent Railway Bridge) and the legends of Mohawk ironworkers. Thus, emerged the concept of Kahnawake Brewing Company and the Black Bridge Taproom. Kahnawake uses the usual staple ingredients for beer but adds a twist. For example, they launched a smoked maple porter that sources its maple syrup from Indigenous maple syrup harvesters. 'Our hope was to create a place here to put out a good product and to have people who could come here, both Native and non-Native, you know, taste our wares and drink in a good atmosphere without fear of racism or anything,' said Leblanc.[60]

One related area that has experienced growth due to the increased demand for micro/craft brews is the hops sector and the Stó:lō people of Seabird First Nation on the Fraser River in British Columbia are capitalizing on this growing demand for hops by using its land for cultivation. The Stó:lō worked as hop pickers in the late 19th and early 20th century. The prohibition era and popularity of low hopped beer resulted in the industry declining in the mid 20th century. With the more recent rising demand for hops and thirst for more hoppy beers like IPAs, Fraser Valley Hop Farms has entered into a partnership with Sqéwqel, the development corporation of the Seabird First Nation, to use some of their land for hop farming. A component of the partnership is to 'rebuild the traditional skill and knowledge that empower them [band members] to become fully self-sufficient and self-reliant in today's world'.[61] Though there is financial incentive to sell parcels of land for residential development (as neighbouring Yakweakwioose First Nation is doing), the Seabird First Nation wants to keep its agriculture land intact. In response to the growing demand for hops, the Seabird First Nation has cleared an additional eighty hectares for Fraser Valley Hop Farms to plant more hops. Once planted, this could make Seabird Island the largest hop farm in Canada. Alex Blackwell of Fraser Valley Hop Farms says of the partnership, 'we're happy to be working with Seabird. I think we're going to build a strong relationship with them. We're the new kids on the block, but we're looking forward to getting involved with the community and ---- being able to offer jobs in the future'.[62]

Indigenous involvement in the alcoholic beverage industry is in its infancy. Up until recently, brewing, distilling, and fermenting alcoholic beverages on reserve land was illegal. These policies in many jurisdictions in Canada and the United States have since been repealed. In the case of the Kahnawake Brewing Company, the founding partners were involved in penning legislation related to brewing on reserve lands that previously did not exist. There are limited networks linking Indigenous entrepreneurs and Indigenous-owned enterprises involved in alcoholic beverage manufacturing. Yet, to create community among those involved in the wine industry for example, Indigenous entrepreneurs and professionals have collaborated with historically racialized groups that have been marginalized by mainstream brewing and distilling organizations.

An example of a collaborative social innovation in this area is Vinequity, an organization that supports Black, Indigenous and other people of colour in the wine industry. Cree Nation member Carrie Rau is a Toronto-based sommelier-in-training and one of the founders. "A lot of times, people of colour work back of house rather than front of house," says Rau. 'When Black Lives Matter protests started, everybody became a little more aware'.[63]

The demand for Canadian made wines, beers and spirits continues to grow. The long-term economic effects of the global pandemic on these industries are not fully understood as this point. But what is clear is that there is a demand for Canadian-owned and operated small batch alcoholic beverages. Closely linked to the growth in the alcoholic beverage sector are experiential tourist destinations that showcase Indigenous culture, foods, and beverages. There are over 1,800 Indigenous tourism enterprises that generated $1.9 billion CAD in the Canadian economy in 2017 as discussed in the Conference Board of Canada's

[58] Sharom, 2021
[59] https://kahnawakebrewing.square.site
[60] Unreserved, CBC Radio, 2018
[61] Seal and Singh, 2017
[62] Seal and Singh, 2017
[63] Rooke, 2021

2019 report on the Indigenous tourism sector in Canada.[64] Relatedly, winery and brewery tours attract visitors from all over the world, with every winery in the Okanagan operating as a tourism business. Destination Canada research shows that 37% of international visitors to Canada look to include Indigenous experiences in their visit, with demand for those experiences far outpacing supply.[65]

Visitors interested in Indigenous tourism provide an important source of economic benefits for communities, but Indigenous tourism also provides a platform to educate and highlight the importance of preserving traditional knowledge, the community, and the land. 'They want to have Indigenous culinary experiences, and some fine wine,' says the President and CEO of the Indigenous Tourism Association of Canada (ITAC), Keith Henry. Pre-pandemic, ITAC was targeting revenue growth of $500 million and 25% more jobs by 2021.[66]

Recommendations and an Innovation Plan

Introduction

We are proposing fifteen recommendations which stem from our insights about the sector and many discussions with Luminary partners. There are two kinds of recommendations, the first focuses on general development initiatives which will benefit the agriculture and agri-food sector. The second group focuses on ways of increasing Indigenous-led research and commercial innovation partnerships. This second group of recommendations constitutes an innovation plan for the Indigenous agriculture and agri-food sector.

Human Resources and Talent Supply

1. **The sector requires an Indigenous human resource plan to ensure that young Indigenous people are receiving the skills, learning, and credentials needed to enter the workforce. This means more Indigenous enrollment in post-secondary institutions and training for the 'future' workforce needs of the sector.**

Elements of the Indigenous human resource plan could include the following:

- Increase Indigenous talent attraction. A culturally relevant attraction plan needs to be developed. A plan is needed to increase the talent pool pipeline so that more Indigenous people have the skills and learning needed to apply for jobs in the agriculture and agri-food sector. A more compelling Indigenous employment brand and brand narrative is needed. One key to advancing Indigenous opportunities in agriculture and agri-food is to invest in skills development and capacity building.
- More research is needed to assess the opportunities presented by Indigenous purchase of retiring businesses to accelerate increased Indigenous participation in the Canadian agriculture and agri-food sector.

Institutional and Organizational Development

2. **It is important that support be provided to build and sustain the institutional structures that are needed for sector growth. An Indigenous industry association, an Indigenous human resource organization, a business association are just a few examples. The roles and purposes of such organizations are varied and can include advocacy, industry representation, strategy building, facilitation, and other roles.**

- Currently, these structures are few and far between and therefore the sector lacks organization and cohesiveness. It needs a legitimate body that can represent the sector at the national level. These institutions need secure multi-year funding and professional management and leadership.
- There is a proliferation of non-Indigenous NGOs that work in the agriculture and agri-food sector and who have helped with the orderly development of the industry. Some of these organizations engage with Indigenous people as issues emerge and consultations are needed but many do not, or they lack the skills and knowledge to undertake this engagement effectively. In short, Indigenous people are not 'at the table' on so many important (policy) issues which effect the development of the sector.

3. **A policy dialogue is needed with Indigenous businesses and NGOs / government agencies to identify strategies by which to increase their leverage of procurement opportunities within the agriculture and agri-food sector. The goal is to better understand the policy supports needed: (1) to increase Indigenous commercial diversification to grow agriculture and agri-food products and services, and (2) to build capacity among Indigenous businesses so that they are better positioned to respond to procurement opportunities under the federal government's five-percent Indigenous Procurement Target.**

[64] Fiser and Hermus, 2019
[65] The full article includes references to Australian and United States Aboriginal and Native American wineries and other operations which are of interest. https://indigenousworks.ca/sites/default/files/attachments/Sipping_Success.pdf
[66] Rooke, 2021

- The goal of the dialogue is to identify the policy supports needed to increase Indigenous businesses' fulfillment of the five-percent procurement target adopted by Agriculture and Agri-Food Canada and other federal departments and agencies which share a commitment to this Canada-wide program and intersect with the product and service needs of this sector.
- The Federal Procurement Program offers a mechanism by which to encourage Indigenous business entry to the agriculture and agri-food sector. The range and types of procurement needs on the part of federal departments and agencies provide incentives for Indigenous business innovation, product/service diversification and joint ventures between Indigenous and non-Indigenous businesses.
- The same is true for supports to streamline larger corporate procurement needs and systems so that Indigenous agriculture and agri-food businesses can participate in these supply chains as well.

4. It is recommended that a strategy be developed for post-secondary institutions to increase Indigenous enrollment particularly in the education programs offered by the thirteen Canadian Faculties of Agriculture, Food and Veterinary Medicine. This includes undergraduate enrollment and graduate studies and could include the formation of new chairs and/or academic positions in areas of agriculture, food, and veterinary medicine that align with Indigenous strategies for growth in these areas.

- Incremental shifts are needed within current post-secondary learning institutions to enroll more Indigenous students and prepare them to play a leadership role in the research needs of the sector. The challenge and opportunity are to further coordinate and focus the growth of Indigenous research expertise in alignment with institutional strengths and the vision Indigenous people have set for themselves for the sector.
- There are segments within the agriculture and agri-food sector which have strong developmental opportunities or potential as envisioned by the Indigenous community. Mushrooms, plant proteins, hemp, and sea plant cultivation are four examples of segments which forecast future growth. The challenge is to grow Indigenous research talent in alignment with the future needs of the sector, as Indigenous people define and see it. Among other things this means building new Indigenous research chairs in these high-growth, high-interest areas of agriculture and agri-food. A ten-year multi-institutional strategy is needed for Canada's leading agriculture post-secondary research institutions. This could be an initiative led by Luminary in concert with organizations such as The Deans Council - Agriculture, Food and Veterinary Medicine (Deans Council AFVM), Fulbright Canada, and other organizations dedicated to building Indigenous academic and research excellence.

Knowledge and Information

5. The Indigenous agriculture and agri-food sector would benefit from further exploration about its brand and what it means for consumers, investors, stakeholders, and producers.

- Currently the sector consists of a wide range of commercial businesses some of which are struggling with the positioning of their products and services in the marketplace. Many of these businesses lack scale, they are disaggregated from one another, and they lack presence in the marketplace. The sector also includes a rich tapestry of community gardens, micro-enterprises, and many organizations are struggling to rediscover the cultural linkages they have historically had with traditional crops and foods. Traditional values and heritage associated with Indigenous culture provide an important foundation for a discussion about brand and what it means in this sector. A return to long-held values, a focus on wellbeing and 'authenticity' are all hallmarks of this brand as are the systems used in crop growth e.g., sustainable processes, regenerative, and the like. The two pathways we see in the development of the agriculture and agri-food sector (commercial and traditional) which on the surface have different trajectories, have much in common. If the narratives about these two pathways could be more clearly united and articulated, it could lead to a stronger overall sector or industry brand. The Indigenous sector offers a unique brand, but it is not yet something that is being fully leveraged by Indigenous producers and businesses.[67]

6. The formation of Knowledge Networks is encouraged for Indigenous businesses to gain a better understanding of the business opportunities within the sector. The compilation of industry intelligence and information needs more organization and improved dissemination and accessibility. The Indigenous agriculture and agri-food sector must create the systems of exchange to improve access, grow, and mobilize knowledge to encourage innovation.

[67] An exception is the brand development in the agri-tourism segment.

Examples of potential knowledge networks are listed below. Each network could evolve along suggested themes and vectors to serve the needs of different stakeholders within the sector, especially with Indigenous businesses and communities.

- North / South networks and dialogues focused on pooling product/market information in categories and themes shared by Canadian Indigenous and US Native American producers and businesses (e.g., product development and data, market development and data, etc.).
- Circumpolar networks and dialogues which pool product/market information (e.g., technical information about agriculture in extreme temperatures, Bellwether research on climate change, etc.).
- Large scale agriculture and agri-food corporations and Indigenous businesses (research and procurement opportunities, etc.).
- Post-secondary research institutions and Indigenous businesses/NGOs (newest pertinent research organized by theme and its potential for commercial applications, etc.).
- Indigenous small business (start-up, access to capital and other information).
- Indigenous communities (food security and sovereignty issues).

7. A comprehensive plan is needed to address the lack of data about Indigenous engagement in the agriculture and agri-food sector. The lack of such data is a major obstacle to the development of an Indigenous vision of the sector for the future.

Collaboration is needed on research studies to improve the data collection, statistical description overview and tracking of Indigenous participation in the agriculture and agri-food sector. This includes research on the following:

- Employment and labour markets.
- Business statistics.
- Investments in research and innovation.
- Sub-sectoral data (e.g., plant protein sector).
- Others.

8. It is recommended that further research be undertaken to develop and design a labelling system for biocultural heritage-based products.

- For many years, Indigenous producers and makers were without protections against cultural and intellectual resource theft from non-Indigenous competitors who were benefiting from imitations and fraudulent claims of authenticity.
- 'Soft' intellectual property rights can help protect markets for biocultural heritage-based products, such as those produced by Indigenous producers and makers. Unlike patents and plant breeders' exclusive rights, soft intellectual property rights, such as collective trademarks and geographical indications, can recognise collective rights over traditional knowledge-based products and their links to territory and culture.[68]
- Geographical Indications (GIs) can serve as indications of the richness of cultural and biological diversity that products are derived from as well as protect distinctions based on terroir.[69] GIs can satisfy consumer desires for easily recognised qualities and help to maintain local traditions of production through quality controls.[70] While labeling and certification schemes exist for ecological and fair-trade products, there is no equivalent labels for designing biocultural heritage production in Canada. Opportunities are emerging for biocultural products due to the growth in organic, herbal medicine and health food markets. These markets, already large in the North, are also growing in urban centres in the South.

Systems

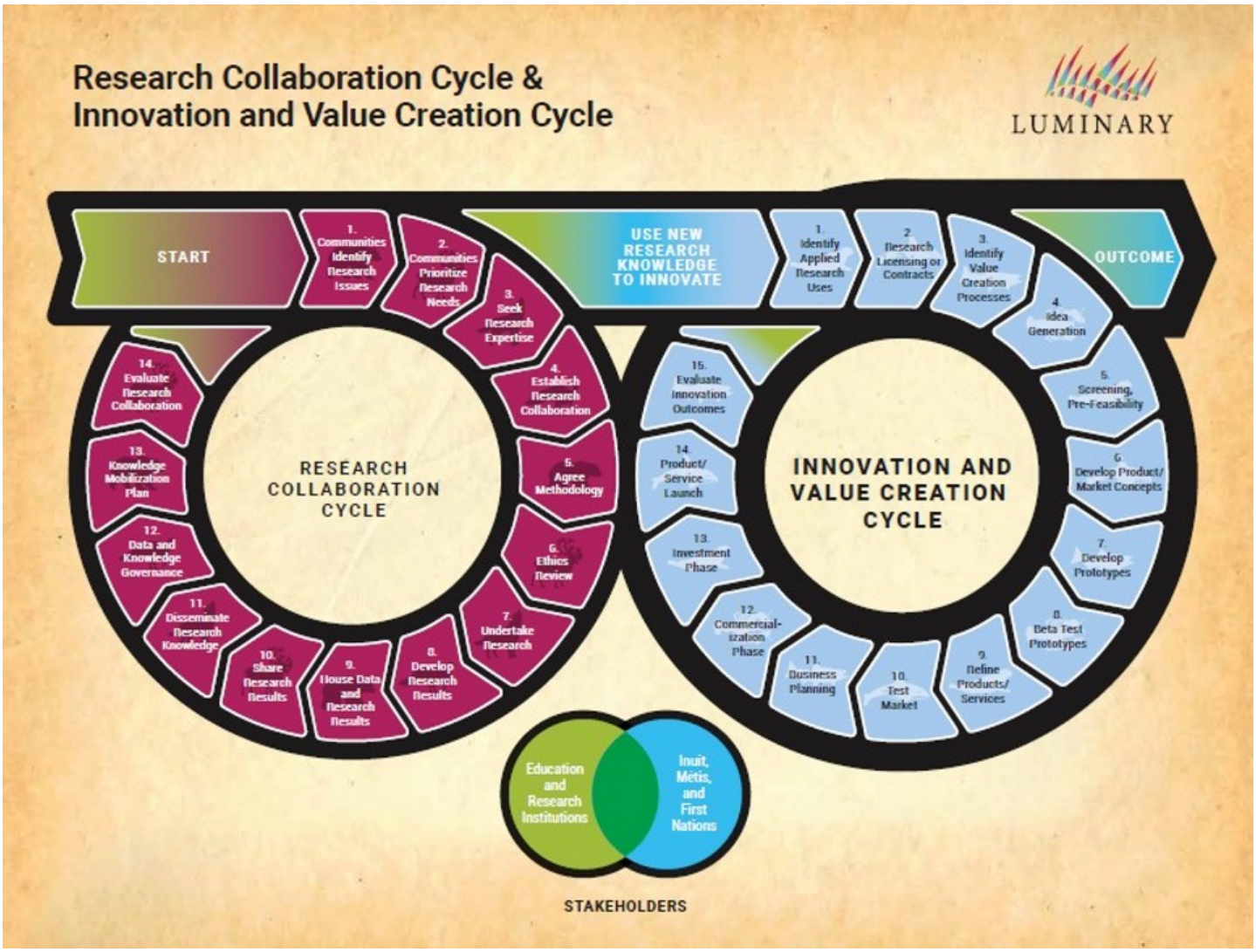
9. The adoption of research and innovation curricula and an awareness program is needed to increase Indigenous-led research and innovation partnerships in the Indigenous agriculture and agri-food sector.

To encourage Indigenous businesses to adopt a culture of commercial innovation and to become more familiar with the ways by which value creation can be driven by post-secondary research, it will be important to undertake a learning, awareness, and capacity-building campaign. In the interests of developing such a campaign, Luminary has advanced a cyclical model of 'The Indigenous Research and Innovation Ecosystem', (pg. 26). This model could be a basis for curriculum development which could be designed with the network of organizations that are committed to innovation in the agriculture and agri-food sector.

[68] www.iied.org
[69] Clark and Kerr 2017; Kerr and Clark, forthcoming
[70] Aylwin, Coombe and Chan, 2012

- The first step in the first cycle, called Research Collaborations, involves Indigenous communities and businesses identifying research needs and then developing and implementing collaborative research with Indigenous or non-Indigenous partners. The knowledge gained from these collaborations is mobilized and then enters the second cycle, called Innovation. The three general outcomes from Innovation are Indigenous economic transformation, employment, and wellbeing. There are over a dozen discrete steps in each cycle.
- We do of course recognize that research and innovation rarely follow a rigid step-by-step process in practice; nevertheless, these steps are commonly identified in research and innovation process models in a similar order. As developmental work continues in the Indigenous agriculture and agri-food sector it will be increasingly important to build out this model further for use in curriculum planning and other kinds of programming to facilitate research collaborations and innovations in the sector. The advantage of this model is that it enables a more surgical conversation about research and innovation needs at each step of the process.

Luminary Research and Innovation Cycles



- A principle of the Luminary research and innovation model is that of 'Etuaptmumk' or Two-Eyed Seeing, a philosophy advanced by Mi'kmaw Elder Albert Marshall's teaching which recognizes and acknowledges both traditional and Western ways of knowing and doing. We can learn from all people and use the knowledge to benefit everyone. This teaching is like the importance of balance, one of the sacred laws in traditional Métis worldviews from the Great Law of Harmony and Balance.
- Curricula, learning guides and resources are needed not only for Indigenous businesses but for post-secondary institutions and organizations that are committed to increasing research and innovation with Indigenous businesses and communities. Curricula and other tools need to be co-developed with communities to identify the steps needed to identify research priorities. So too, post-secondary research institutions need training and learning resources which assist their engagement with Indigenous businesses. Both sets of curricula are needed to strengthen the performance of the Indigenous research and innovation ecosystem.

10. Research and documentation are needed to further promote sustainable Indigenous Food Systems. A central pillar to food security and food sovereignty for Indigenous communities is investing in agriculture and agri-food processes that prioritize sustainability. The regenerative agriculture approach not only values environmental sustainability but also socio-economic sustainability in the form of wellbeing, skills development, and stable employment opportunities for community members.

Several organizations and businesses profiled in this document prioritize sustainability as they grow their agri-food businesses while supporting Indigenous communities to produce culturally appropriate food that is affordable and accessible. This contributes to the wellbeing of community members socially, culturally, and nutritionally. Some communities have had success with closed production systems that attempt to limit waste. Linking businesses through the agri-food system, such as Indigenous-owned small-scale meat processing facilities that supply products to local restaurants and hospitality venues are ways that Indigenous communities have successfully applied their values and traditional principles to production cycles.

- Closed systems are not only a win for climate smart agriculture but have the potential to help communities move towards less reliance on the globalized agri-food supply chain that is facing increasing costs and food product delivery lags. We have discussed the importance of digitization, vertical agriculture, and precision agriculture as ways to deal with climate change and reducing inputs such as fertilizer. But what is needed to propel these visions forward is more Indigenous youth enrolled in agriculture programs focused on using technology in agribusiness. This is an important way to foster Indigenous-led research in agriculture and agri-food while meeting the food needs of the future in a sustainable way. It is important that the future development and growth of the agriculture and agri-food sector be provided opportunities to do so both with the input and guidance of Indigenous peoples. The development of culturally relevant programs and supports will be necessary to achieve inclusive growth.

11. A comprehensive sector ecosystem mapping needs to be completed. The sector lacks the organization and systems needed to match Indigenous businesses to the wide range of organizations that have funds and expertise to offer to Indigenous businesses to develop and commercialize new products and services.

There are many such organizations that offer specialized services and funding for commercial innovation. The National Research Council of Canada Industrial Research Assistance Program (NRC IRAP) is one example. Most of these organizations are non-Indigenous, and they lack the knowledge and strategies to penetrate and service the Indigenous business community. An efficient solution is to offer up a 'matchmaker' facilitator that can act as an interlocutor and link these organizations to the needs of the Indigenous business community. This is a role that Luminary could play.

Capital

12. It is recommended that a plan be developed to attract Impact Investors to the Indigenous agriculture and agri-food sector. In the current period with government budgets becoming more depleted due to the cost of Covid responses, and other priorities, it is important that new sources of capital be identified to invest in the growth of the sector.

'Impact investing' is a market ecosystem and represents the range of capital supplying capital demands and connecting products. As the figure below illustrates, impact investing is not one product or one thing but a category of activities. It therefore captures a variety of tools, and a variety of profit motivations. [71]

- At present, there are very few impact investment funds and products focused exclusively on supporting

[71] UBC Sauder School of Business, 'Impact Investing in the Indigenous Context: A Scan of the Canadian Marketplace', University of British Columbia, March 2018, pg.53

[72] Examples in the First Nations context include Raven Investments and The McConnell Foundation which is a Montreal-based private foundation that does impact investing and has made significant investments in Indigenous housing and other needs. The McConnell Foundation has three focus areas: climate, communities, and reconciliation.

Indigenous peoples.[72] It is more common to find impact funds and products that more broadly target diversity, inclusion, and/or investing in Black, Indigenous, People of Colour (BIPOC) entrepreneurs without explicitly calling out Indigenous populations and Indigenous reconciliation. There is a growing recognition that Indigenous reconciliation is a distinct area of impact and that it should not be bundled in with other BIPOC or diversity and inclusion initiatives.

- Impact investing is still an early trend and opportunity in Canada and activity here pales in relation to the United States.[73] Canada's portion of the estimated North American US $291 billion impact investment assets accounts for just a sliver of that figure at just over $10 billion impact investment assets.[74] A 2014 study of impact investments in Canada concluded that there are many opportunities for growth of impact investing in Canada.[75]

Product and Market Innovation

13. There is an industry-wide discussion needed to plan for Indigenous agriculture and agri-food products and market expansions and the policies needed to support such expansions. In this discussion, it is recommended that the model developed by the US Intertribal Agriculture Council and its Native American Indian Foods program be given serious consideration as a basis for a similar program for Canada's Indigenous agriculture and agri-food sector.

The American Indian Foods Program offers a unique developmental model with its dedication to product and market development, certification, and branding. Over five hundred Native American foods have been certified and branded. Representation of these products at trade shows and in marketing programs offer better scale and visibility for individual producers in an otherwise crowded and noisy marketplace. There is no comparable body or system like it in Canada to focus the efforts of Indigenous agriculture and agri-food businesses toward industry growth.

14. There are many product categories that offer promise within the Indigenous agriculture and agri-food sector. These need to be nurtured because they are new, they are under-developed, and/or they offer further opportunity for growth, and align with global demand trends. Incremental work is needed to support these sub-segments.

A short list includes the following product categories:

- Plant-Based and Other Future Foods (Value-added products and value addition along supply chains). Interest in plant-based foods and other value-added food products has exploded over the last ten years. The plant protein sector includes efforts to use seaweed and pulses as well as fungi as protein sources. This sector is full of opportunities for Indigenous investment that can meet growing demand in the conventional market for extractions and functional foods while balancing the goals of sustainable, climate smart agriculture.
- This profile has discussed some examples of businesses involved in these sectors such as Tanka Bars that demonstrate Indigenous involvement in value-added agri-food products.[76] This sector provides opportunities for Indigenous communities to invest, specifically the seaweed and sea plants sub-sector that need more Indigenous researchers and technical expertise. This is an area where research institutions and Indigenous communities have partnered to discover sustainable production and processes that serve the interests of Indigenous communities to preserve cultural heritage, ecosystems, and traditional foods, while engaging in this profitable sector.
- Sustainable food production is a practice driven by a unique strategy that integrates traditional knowledge, tourism, environmental stewardship, and ways of understanding and coping with climate change. An example of these kinds of integrated approaches can be seen at the Kanaka Bar Indian Band. Located fourteen kilometers south of Lytton, British Columbia, Kanaka Bar Indian Band is one of 15 Indigenous communities that make up the *Nlaka'pamux* Nation today. Kanaka Bar has been a leader in environmentally sustainable practices. Initiatives have included weather stations, water gauging stations, solar projects, hydro projects, and wind energy with battery storage.[77]
- Heritage Seeds and Crops. The link between Indigenous nutrition and health and the foods they eat are becoming better understood by Indigenous communities and scientists alike in recent years. For example, the high rate of Indigenous diabetes has been linked to a diet which had moved away from traditional foods in favour of processed foods that were imported into Indigenous communities. Part of this trend is the result of Western policies and the de-valuing of the traditional economy in favour of efforts to build wage economies in Indigenous communities.

[73] Global Impact Investing Network, Sizing the Impact Investing Markets, April 2019
[74] Sauder School of Business, University of British Columbia, Impact Investing in the Indigenous Context: A Scan of the Canadian Marketplace Executive Summary March 2018
[75] Ellen Martin, MaRS Centre for Impact Investing Lexi Rose, Royal Bank of Canada Kelly Gauthier, Purpose Capital Muska Ulhaq, MaRS Centre for Impact Investing, State of the Nation: Impact Investing in Canada, 2014
[76] Based on a traditional Native American Lakota recipe for wasna or pemmican, Tanka Bars are 100% natural. A real food meat bar with a smoky/sweet flavor, made with grass fed bison and tart-sweet cranberries. Tanka products are sold as a snack food.
[77] https://www.kanakabarband.ca/

Preserving heritage seeds and crops is an important component of Indigenous food security and sovereignty which can help address dietary and nutritional deficiencies found in communities across Canada. Partnerships between governmental agencies, research institutions and Indigenous communities have focused on preserving heritage crops and experimenting with reintroduction (or scaling up) of varieties designed to feed communities with locally and regionally grown foods.

- Agri-food and tourism has so many opportunities for Indigenous people and there are already many successes to build on. Indigenous Tourism Ontario is a wonderful example of a partnership between the Government of Ontario and Indigenous agri-food entrepreneurs that promote Indigenous cultures and food practices. Linking traditional Indigenous foods with tourism has proven to be a successful combination that has increased the public awareness of traditional Indigenous foods as well as cultural awareness in several provinces such as British Columbia and Ontario. Wanuskewin Heritage Park in Saskatchewan is a perfect example of integrating Indigenous foods and culture into a tourism experience.
- In addition to *wild* mushrooms, mushroom cultivation offers opportunities for micro, small, medium, and large businesses. There are many mushroom varieties that can be cultivated. Value-added products made from mycelium is another direction for product development. Mushrooms have medicinal uses and are important for the environment and sustainable farming techniques.
- Other product expansions could include those discussed in this report such as wild rice, beers, wine or spirits, maple syrup, plants, fibres, and many others. Product expansion and diversification is especially worth pursuing if unique branding can be incorporated and positioned as premium priced products because of their affinity with Indigenous cultures and practices.

15. More programs are needed to address the engagement gap between Indigenous small and medium businesses and large (non-Indigenous) corporations operating in the agriculture space. Large companies need 'playbooks', and information to assist their engagement strategies. They lack cultural knowledge which affects their ability to identify and develop trusting relationships with Indigenous businesses. There are insufficient partnerships between Indigenous businesses and corporations in the agriculture and agri-food sector. In addition to formal partnerships (e.g., joint ventures) there is a need for other kinds of collaborations such as knowledge sharing, marketing, and product development (partnership) arrangements.

In addition to the engagement gap that exists between Indigenous businesses and post-secondary institutions there is an engagement gap between large corporations in the agriculture space and small/medium Indigenous businesses.

- Indigenous communities continue to be excluded from the mainstream economy due to a lack of successful partnerships with non-Indigenous businesses. Continued deficiency of partnership linkages and weak business integration with the mainstream economy means that many Indigenous peoples continue to experience socio-economic circumstances marked by poverty and socio-economic marginalization. Most Indigenous reserves and small communities continue to lack the critical business infrastructure needed to create capital and added value which can generate incremental secondary and tertiary growth in their microeconomies.
- In contrast, successful Indigenous communities like Membertou, English River, Champagne-Aishihik or Osoyoos, have been able to develop successful partnerships with larger non-Indigenous corporations. We see, in communities like them, entirely different socio-economic outcomes. By partnering, Indigenous communities gain not only access to capital but also to expertise, knowledge, and experience.
- There are some corporations that have developed many partnerships with Indigenous communities. Nutrien, a supporter of Indigenous Works/Luminary's project is one. There are other examples of successful companies that have experience working with the Indigenous community but there are equally many companies that have not. More programs are needed to facilitate these partnerships especially in the agriculture and agri-food sector.

In summary these fifteen recommendations speak to the need to catalyze general development initiatives which will benefit the Indigenous agriculture and agri-food sector. Several of the recommendations also focus on ways of increasing Indigenous-led research and commercial innovation partnerships. These second group of recommendations constitute an innovation plan for the Indigenous agriculture and agri-food sector.

A list of bibliographic sources consulted for this report is available.[78]

[78] List of bibliographic sources consulted for this report https://indigenousworks.ca/sites/default/files/attachments/List_of_Bibliographic_Sources_for_the_Short_Version_of_the_Agriculture_Strategy.pdf

About Indigenous Works and Luminary

Indigenous Works is a national Indigenous not-for-profit organization that is ISO 9001 certified (quality management system). It was established in 1998 as a recommendation from the 1996 Report on the Royal Commission on Indigenous peoples with a mandate to improve the engagement of Indigenous people in the Canadian economy. Indigenous Works is governed by an Indigenous board of directors with private sector, Indigenous economic development corporations, and independent directors.

Luminary is the name of an initiative established in 2019 by Indigenous Works which brought together 150 partners in a dialogue to co-design a new Indigenous innovation strategy for Canada. The initiative has potential to be a game-changer by closing the gap between non-Indigenous post-secondary research institutions and Indigenous communities, as well as elevating the role and kinds of Indigenous-led research needed to stimulate Indigenous socio-economic development, jobs, and wellbeing. One of Luminary's goals is to facilitate the infusion of increased research dollars into Indigenous communities and businesses as a catalyst for growth. The dialogue platform developed by Luminary underscore the value of co-design, Two-Eyed Seeing and other Indigenous philosophies which emphasize the importance of traditional knowledge and knowing, the importance of Indigenous institutions, support for nation-building, an emphasis on innovation, wellbeing, the importance of systems-thinking, and other hallmarks.[79] The Luminary platform and its methodologies lend itself to dialogue and policy exploration on a wide range of subjects.

[79] Rick Colbourne, Peter W. Moroz et al. Indigenous Works and Two-Eyed Seeing: Mapping for Indigenous-led Research', Qualitative Research in Organizations and Management: An International Journal, Published 13 December 2019.

Indigenous Works

LUMINARY

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