
AGRICULTURAL JUST TRANSITIONS: PUTTING LABOUR AND LIVELIHOODS INTO CONVERSATION WITH EMERGING ALTERNATIVE PROTEINS



Stephanie Eccles, Postdoctoral Researcher, UFV
Angela McIntyre, Postdoctoral Researcher, UFV
Jessica Mukiri, Researcher UFV
Alesandros Glaros, Research Associate, UFV

FUNDING

This report is part of a larger research project,
**The Social Implications of Agri-Genomics: Ensuring a Just Transition
to Climate-Resilient Agricultural and Food Systems in Canada**
(www.ufv.ca/agrigenomics), co-led by the Food and Agriculture Institute
at the University of the Fraser Valley and Royal Roads University.

This project is co-funded by Genome Canada and Genome BC under the
Climate-Smart Agriculture and Food Systems (Interdisciplinary
Challenge Teams) program.



TABLE OF CONTENTS

04 EXECUTIVE SUMMARY

05 Key Findings

05 Recommendations

06 INTRODUCTION

06 BACKGROUND AND CONTEXT

08 LABOUR AND LIVELIHOODS FRAMEWORK FOR AGRICULTURAL JUST TRANSITIONS

10 WORKSHOP METHODOLOGY AND DESIGN

11 **THEME 1:** SPATIAL CONSIDERATIONS: RURAL AND URBAN DEVELOPMENT

13 **THEME 2:** TECHNOLOGY, INNOVATION, AND IMPACTS ON WORK

16 **THEME 3:** GOVERNING ALTERNATIVE NOVEL PROTEIN PRODUCTION

21 CONCLUSION

23 RECOMMENDATIONS

EXECUTIVE SUMMARY

The transition toward climate-resilient food systems is accelerating, with alternative proteins including plant-based, precision fermentation, and cellular agriculture emerging as key components of future food strategies. Yet discussions of these technologies often overlook their implications for labour, livelihoods, and rural communities. This report addresses this gap by examining how emerging alternative protein technologies intersect with agricultural labour, governance, and just transition frameworks.

This report draws on insights from a two-day Learning Exchange convened in July 2025 by the Food and Agriculture Institute at the University of the Fraser Valley. Participants included researchers, industry partners, and members of a Stò:lō Community Advisory Council. Discussions explored how emerging agricultural technologies particularly cellular agriculture, may reshape labour, rural economies, governance structures, and Indigenous food systems.

Participants emphasized that agricultural transitions must be guided by just transition principles that prioritize fairness, equity, and democratic participation. While alternative proteins are often framed as opportunities for innovation, participants cautioned that technological transitions risk reproducing existing inequalities if labour and governance considerations are not considered.

A key finding of the workshop was that participants largely viewed cellular agriculture as supplemental rather than transformational to conventional livestock production. While this framing minimizes anticipated disruption to existing agricultural systems, it may do so by preserving the very labour inequities, corporate concentration, and structural power asymmetries that underpin the industrial agri-food system, thereby constraining the broader ecological and climate benefits cellular agriculture could achieve. This raises important questions about whether emerging technologies will transform agricultural systems or be absorbed into them.

Participants also identified significant governance gaps. Canada currently lacks a national strategy for alternative novel proteins, creating uncertainties for workforce development, infrastructure investment, and regulatory oversight. At the same time, participants suggested that the relatively early stage of regulatory development provides an opportunity to co-develop the sector through inclusive governance processes that ensure Indigenous communities, agricultural workers, and producers have a meaningful role in shaping its future.

Spatial considerations emerged as another key theme. Participants raised concerns that urban-centered development of cellular agriculture may marginalize rural communities while concentrating economic benefits in metropolitan regions. However, participants also identified opportunities for rural integration, diversification, and ecosystem restoration—particularly where transitions reduce pressures of conventional livestock production.

Finally, participants emphasized that discussions of agricultural transitions often focus on producers while overlooking farm workers. They argued that a just transition cannot be achieved by focusing solely on the economic viability of farms; it must also account for the workers who sustain agricultural production by addressing labour rights, working conditions, labour migration regimes, and the structural inequalities that organize agricultural labour.

The report highlights both opportunities and risks presented by emerging alternative protein technologies. Whether these technologies support equitable and sustainable transitions will depend on governance frameworks, labour policies, and inclusive decision-making processes.

KEY FINDINGS

- Alternative proteins are increasingly framed as supplemental to conventional livestock production rather than transformational
- Labour and livelihoods remain underexamined in discussions of emerging food technologies
- Workforce development remains speculative without enabling policy frameworks
- Canada lacks a coordinated national strategy for alternative novel proteins
- Urban-centered development risks marginalizing rural communities
- Indigenous governance and food sovereignty must be central to agricultural transitions
- Technological transitions risk reinforcing existing corporate concentration and labour practices

RECOMMENDATIONS

1. **Develop a National Agricultural Just Transition Strategy**
 2. **Center Workers, Producers, and Livelihoods in Agricultural Innovation**
 3. **Invest in Inclusive Education and Workforce Development**
 4. **Strengthen Rural Economic Development and Diversification**
 5. **Advance Indigenous Self-Determination and Food Sovereignty**
 6. **Democratize Agricultural Governance and Participation**
-

INTRODUCTION

The concept of a just transition has gained prominence in climate policy and sustainability debates shaping national and international strategies for decarbonization and workforce transformation. Yet within agri-food systems, and particularly in discussions surrounding emerging alternative proteins,¹ labour and livelihoods remain underexamined. This report, *Agricultural Just Transitions: Putting Labour and Livelihoods into Conversation with Emerging Alternative Proteins* addresses this gap. It argues that emerging alternative protein technologies are increasingly framed as supplemental to conventional livestock production. While this framing may reduce perceived disruption, it risks reinforcing existing labour inequities and power asymmetries within agri-food systems. A just transition in agriculture therefore requires governance frameworks that center labour, Indigenous sovereignty, and equitable participation.

BACKGROUND AND CONTEXT

The agricultural sector occupies a central position in the climate crisis, both as a contributor to greenhouse gas emissions and as a sector highly vulnerable to impacts. Advancing climate stability, food security, and socioeconomic justice for farmers and farm workers requires sector-specific strategies that integrate mitigation, adaptation, and workforce resilience. The EAT-Lancet Commission 2.0 report calls for a “smaller livestock system globally,” estimating a 50% reduction in livestock-sector employment by 2050.² Among the proposed pathways are increased consumption of plant-based foods and the development of novel alternative proteins, including cellular agriculture. As these technologies move from concept to commercialization, questions emerge about workforce transitions for those currently employed in conventional animal agriculture.

Globally, food systems rely on a large workforce performing low-wage, undervalued, and often hazardous work.

¹ A note on language. In our report we follow the Good Food Institute’s usage of alternative proteins to describe the tripartite of plant-based, precision fermentation and cellular agriculture broadly, and novel alternative proteins to specifically refer to cellular agriculture. Adopting the definition from the Government of Canada, cellular agriculture is defined as an emerging technology in the production of food usually derived from animals (meat, seafood, eggs, milk products) using cell culture methods instead of live animals.

² Rockström, J., Shakuntala, H.T., Willet, W.C., Gordon, L.J., Herrero M., Hicks, C.C., et al., (2025). The EAT-Lancet Commission on health, sustainable, and just food systems. *The Lancet*, 406(10512), 1625-1700.

In Canada, the agri-sector employs more than 2.3 million people representing 1-in-9 jobs across the value chain from primary production to food service.³ Yet the sector faces mounting pressures, including industry consolidation, rising land costs, rural depopulation, and the devaluation of agriculture labour characterized as 'low-skill'.⁴ The workforce is composed of domestic workers, international students, and temporary foreign workers employed through the agricultural streams of the federally managed Temporary Foreign Worker Program (TFWP).⁵



Labour shortages are projected to intensify. The Canadian Agricultural Human Resource Council (CAHRC) estimates that more than 100,000 agriculture jobs – 1-in-3 jobs—will be vacant by 2030 unless significant action is taken to attract, retrain, and properly train the next generation of workers.⁶ At the same time, the report predicts that 4-out-of-5 agricultural jobs will be filled by temporary foreign workers. In British Columbia alone, nearly 10,000 workers are recruited annually through the TFWP programs, yet positions remain unfilled. The latest Statistics Canada data shows that in 2017, B.C.'s agricultural sector was unable to fill 3,100 positions, representing roughly 8% of the workforce. According to the BC Agricultural Council (BCAC), these vacancies resulted in a staggering \$216 million in lost revenues in 2018, the highest loss of revenues of any Canadian Province.⁷

³ Government of Canada (2025). The state of labour in agriculture and agri-food.

<https://agriculture.canada.ca/en/sector/data-reports/state-labour-agriculture-and-agri-food>

⁴ Canadian Agricultural Human Resource Council. (2024). Sowing seeds of change.

<https://agriculture.canada.ca/en/sector/data-reports/state-labour-agriculture-and-agri-food>

⁵ Nearly one-quarter of all agricultural employees in Canada are temporary foreign workers. As of 2024, approximately 78,000 TFWs were employed in primary agriculture and an additional 42,000 in manufacturing, with the majority concentrated in Ontario, Quebec, and British Columbia (BC).

⁶ Canadian Agricultural Human Resource Council (2024). "Sowing seeds of change".

⁷ BC Agricultural Council (2025). Access to labour factsheet. <https://bcac.ca/wp-content/uploads/2025/05/BCAC-Position-on-Labour.pdf>

According to the National Farmers Union (NFU), “the crisis in farm labour goes beyond a labour shortage that threatens Canada’s food production capacity. It is also an alarm bell for Canada to heed before we lose the essential skills and knowledge carried by the people who do the work of agriculture.”⁸ The NFU advocates that “Canada needs an agricultural labour strategy that puts the people who labour - farmers and farm workers - at the center.” This aligns with calls for future food systems that prioritize decent work, human rights, and environmental sustainability, ensuring that transitions in agriculture are both equitable and resilient.⁹

LABOUR AND LIVELIHOODS FRAMEWORK FOR AGRICULTURAL JUST TRANSITIONS

In food systems, a just transition is the process of moving toward low-carbon, climate-resilient, and sustainable food systems in ways that are fair and equitable for all stakeholders.¹⁰ Such a transition should not exacerbate existing inequalities (e.g., job precarity, hazardous work environments) or create new injustices (e.g., exclusion from agri-tech innovation, cultural erasure). Instead, it should ensure that transitions redistribute benefits and burdens fairly, recognize diverse cultural and knowledge systems, and expand people’s capacity to adapt and thrive. As Mijin J Cha (2024) articulates in *A Just Transition for All: Workers and Communities for a Carbon-Free Future*, a just transition rests on two core principles: (1) an actual transition away (*not just within*) a sector, and (2) that it must be just for both workers and communities.¹¹ Cha insists that work and livelihoods are fundamentally environmental issues, contending that transitions are about more than simply reducing greenhouse gas emissions but that a “project of actualizing a just transition requires a much broader, more comprehensive societal transition to a more just world.”¹² Cha proposes a policy-oriented framework the *Four Pillars of Just Transition* derived from historical transition experiences and applied to governance contexts (see Table 1).

¹⁰ Cabral, L., Volonterio, M., Peša, I., Millar, G., & Levick-Parkin, M. (2026). Just food transitions: a plurality of framings and repertoires from below. *The Journal of Peasant Studies*, 53(2), 328–349. <https://doi.org/10.1080/03066150.2025.2488812>

¹¹ Cha, JM. (2024). *A just transition for all: workers and communities for a carbon-free future*. MIT Press: Cambridge.

¹² Cha, “A just transition,” 7.

Four Pillars of Just Transitions	Complementarity in Agriculture
1. Substantial Government Support (robust public sector role, restructuring, assistance).	Both stress who governs transitions: governments must not only fund but also guarantee democratic participation. In agriculture, farmer unions and rural communities should shape subsidy, land, and agri-tech policies.
2. Dedicated Funding Streams (reliable resources for wage replacement, retraining, community development).	Both emphasize who receives material benefits/support: transition funding must not bypass small-scale farmers, Indigenous communities, or marginalized workers.
3. Economic Diversification (moving away from single-industry dependence; investing in new sustainable sectors).	Both focus on resilience and adaptive capacity: diversification provides new livelihood options, while capabilities ensure farmers and rural workers can thrive in multiple sectors (agroecology, alt proteins, vertical ag, digital tools).
4. Strong, Diverse Coalitions (alliances of workers, unions, communities, policymakers, advocacy groups for oversight)	Both stress whose voices count: coalitions must recognize marginalized groups (women, youth, migrant workers, Indigenous custodians). In agriculture, this prevents transitions from being dominated by elite or corporate actors.

Table 1 – Just Transition Framework

These frameworks enabled our workshop to move beyond technological optimism or narrow economic analysis and cultivate a shared space where participants could grapple with agri-genomic transitions as live, uneven, and deeply political transformations.



WORKSHOP METHODOLOGY AND DESIGN

The Food and Agricultural Institute at the University of the Fraser Valley and the Canada Research Chair in Climate Change, Biodiversity and Sustainability at Royal Roads University organized a two-day virtual Learning Exchange in July 2025. 18 participants, including industry partners, researchers, and members of the Stó:lō Community Advisory Council engaged in dialogue, shared learning, and reflexive discussion across academic, policy, industry, and community perspectives.

The two-day workshop flowed from a high-level to ground-level perspective. The first workshop explored the framework of the just transitions and mapped stakeholders and rightsholders, while the second workshop centered discussions on place-based and technology-specific conversations.

The workshops were held virtually on Zoom, and activities were facilitated using Zoom's collaborative features (e.g., Whiteboard, breakout rooms). These multi-modal forms of communication enabled collaboration between participants. The workshop was transcribed following the sessions.

All workshop materials, including Whiteboard outputs, chat messages, and analytical notes generated through collective discussion of the transcripts were systematically organized and synthesized.



As noted above, four members from the Stó:lō Community Advisory Council (CAC) attended the workshop. This CAC is comprised of Stó:lō Knowledge Holders, Elders, and foodways practitioners. For over three years, they have been supporting and advising projects at the University of the Fraser Valley's Food and Agriculture Institute (FAI). This review was taken in accordance with a Project Accord outlining reciprocal responsibilities of collaboration between the CAC and FAI researchers. The CAC brings a relational lens to questions of technology assessment and governance that reflect important stewardship principles. For example, the recognition and honoring of the principles of *tómiyeqw* (the traditional teachings as well as cultural and spiritual protocols that embrace the seven generations of the past, present, and future). Any knowledge co-produced by the CAC and research partners is subject to iterative, ongoing consent and final approval by the CAC of any work intended for public dissemination, in accordance with data sovereignty principles.

THEME 1: SPATIAL CONSIDERATIONS: RURAL AND URBAN DEVELOPMENT

There are many crucial spatial and political considerations for the development of emerging alternative protein production systems. There was a concern across research participants that agricultural technologies would benefit urban regions at the expense of rural areas. Generally, the participants were more optimistic when discussing futures that incorporated rural economies and workers within agricultural innovation pathways. These challenges and opportunities were discussed in the second workshop, where rural and urban spatial imaginaries for cellular agriculture were juxtaposed and critiqued. Participants argued that the rural imaginary represented in the RespectFarms case study may have more potential for bottom-up governance as innovation could be “initiated from the farmer...not imposed from outside” (Academic). One participant noted the importance of grassroots engagement (in rural areas) for facilitating more socially responsible innovation pathways that increase the likelihood of it being “successful” (Industry representative).

Participants responded positively to the RespectFarms pilot project precisely because it integrates new technologies into existing rural spaces rather than displacing them. One participant shared a fieldwork story from her research in the

Fraser Valley with dairy farmers: “some of them were open to potentially continuing their cow dairy as well as precision fermentation. If it were feasible in terms of resources and cost...they can continue doing what they love but do it in a way that is future proof or more sustainable” (Academic).

A risk identified by the workshop participants was the potential of urban skills and employment development pathways to favour post-secondary-educated individuals over existing agricultural workers, farmers, and producers. A participant voiced concerns about potential access to training further dividing urban and rural agri-food workforces: “... if training programs are inadequate, could leave agriculture workers behind” (Academic). However, cellular agriculture in general was viewed as offering new pathways into agricultural employment. This could be a viable return pathway to farming for students with familial ties to agriculture who may have chosen university, thereby expanding agricultural livelihoods.



Participants observed that cellular agriculture challenges long-standing cultural geographies of food production. Instead of rural barns and fields, cellular agriculture was described by participants as “shiny,” “sterile,” lab-like facilities situated in urban environments, changing perceptions of food production. The urban siting of cellular agriculture disrupts the conventional spatial imaginaries of agriculture. Instead of remote, closed-off slaughterhouses, a new agricultural model emphasizes openness and transparency, including the windows and public tours seen in the Upside Foods video. Participants described both excitement and unease about this visibility, asking, “is there such a thing as too much transparency” (Academic)?

The prospects of land sparing and Land Back for First Nations communities were also discussed. Land-use shifts from cattle ranging or feed crops could lead to “removing some of these damaging land-occupying industries... free[ing] it up to be returned to Indigenous stewardship” (CAC member).

Specific places such as Semá:th (Sumas) Lake were raised as concrete examples of a spatially rooted vision for food and land justice. A participant from the CAC explained that “if...all the agriculture in the Fraser Valley around Sumas Lake were to move elsewhere. Maybe the lake could be restored...and returned to Indigenous stewardship...there’s that sort of realm of replacement and displacement also that I think about” (CAC member). These ideas illustrate that spatial development is not only about urban placement of new infrastructure, but also consider what urban siting could mean for pathways to ecological and cultural restoration of Indigenous territories.

British Columbia’s relatively high rural land values and small lot sizes raised the question of whether cellular facilities could compete. This reflects the core concern that cellular agriculture is capital-intensive and is currently being developed by powerful corporate food system actors, risking the reproduction of a centralized and monopolized food system.

THEME 2: TECHNOLOGY, INNOVATION, AND IMPACTS ON WORK

Participants explored how new technologies like digital tools, including genomics, automation and cellular agriculture, are reshaping agricultural production. One participant emphasized the need to contextualize these questions in British Columbia particularly as adoption rates of new technologies in the province are the lowest in Canada due to limited capital investment and high land prices. They raised the question “where is investment going to come from? [...] how do we attract investment? And then do we, to use an old term, do we sell the farm to try to solve the problem” (Academic)?

Considering financial pressures, others expressed concern about technological change coupled with increased corporate concentration within the food system. As one participant summarized, “I see a theme emerging: greater capitalistic control over people’s livelihoods” (Academic). This led to questions about broad impacts on labour, including deskilling and reskilling and the parallel question of new digital agricultural jobs replacing traditional employment.

Participants highlighted several possible labour-related trade-offs within emerging agricultural technologies. A key idea was that emerging cellular agricultural technologies are potentially complementary to current transferable skillsets in the

conventional labour force. One cellular agriculture industry participant noted their background in conventional agriculture as a strength. This observation contrasts with more common framings of cellular agriculture as highly disruptive or at odds with conventional farming systems skills and backgrounds. A participant commented on how the RespectFarms project exemplifies how important it is to “empower farmers who are often left behind in discussions about new food technologies (Academic).

Another key opportunity identified by participants was potential psychological, social, and workplace safety benefits of adopting new agrifood technologies. Agri-food technologies were positioned as a potential intervention in long-standing safety issues in agriculture, potentially reducing exposure to physically dangerous and psychologically taxing tasks (e.g., slaughtering animals). However, these benefits were understood as contingent on the scale of implementation and who controls investment decisions.

The intersection of agri-food technology and Indigenous food sovereignty was a key focus of the workshop conversations. Here, emerging agri-food technologies were identified both as a threat and an opportunity. On one hand, Stó:lō Community Advisory Council participants raised foundational ethical and biosafety concerns regarding the use and extraction of animal and plant genetic material as the basis for technological advancements. The concern expressed was that without consultation, engagement, or the requisite ethical framing, advancements in agri-tech and cellular agriculture reproduce colonial extractive practices. This is of particular relevance for cultural keystone species¹³ such as salmon, who are of deep importance to communities in British Columbia and the western coast of North America: “who said you could go and take an ancestor, pull a bunch of DNA out of it, him, her, whatever, and then make a whack of salmon that you can now make money on” (CAC member)?



¹³ Cultural keystone species are described broadly as “plants and animals that form the contextual underpinnings of a culture, as reflected in their fundamental roles in diet, as materials, or in medicine. In addition, these species often feature prominently in the language, ceremonies, and narratives of native peoples and can be considered cultural icons.” Garibaldi, A., & Turner, N. (2004). Cultural Keystone Species: Implications for Ecological Conservation and Restoration. *Ecology and Society*, 9(3). <http://www.jstor.org/stable/26267680>

On the other hand, emerging agricultural technologies were identified by some of the CAC members as a strategy for Stó:lō communities to adapt to a changing social, political, and environmental context. For example, one CAC participant noted this with the case of cellular agriculture: “[Our community] is having huge changes, faster. So how can we adapt? Well, we can adapt by exploring what this cellular agriculture can do or not” (CAC member). Later, however, the same participant noted that the difficulties encountered are likely to be significant.

For many Indigenous Peoples across Canada, including the Stó:lō, restoring self-determination and revitalizing languages and cultures are inseparable from rebuilding food sovereignty and food security and economic development priorities. The enormous cultural, political and economic diversity across First Nations, Inuit and Métis peoples, however, precludes any generalizations about the risks and opportunities of agri-genomics for Indigenous land, work and livelihoods, and even the dimensions of justice in technological transitions, which can only be defined by the communities themselves.¹⁴

Questions of equity and access position emerging agri-genomic technologies in different realms of governance. Transitions have the potential to positively and negatively disrupt work, to shift power dynamics and to include and exclude sectors of the population. The risks are higher where there are pre-existing, and sometimes

historically entrenched, equity challenges around access to land and capital, education and training, and barriers to participation in planning and decision making. These questions parallel debates about agri-tech consolidation and agri-digitalization and point toward the risk of reproducing and introducing new inequalities for agri-food workers.



¹⁴ Halmai, N.B., Taitingfong, R., Jennings, L.L., Yracheta, J., Garba, I., Lund, J.R., Curley, C.A., Claw, K.G., Taulii, M., Garrison, N.A., & Carroll, S.R. (2025). Indigenous Data Sovereignty in Genomics and Human Genetics: Genomic Equity and Justice for Indigenous Peoples. *Annual Review of Genomics and Human Genetics*, 26, 375–400. <https://doi.org/10.1146/annurev-genom-022024-125543>

THEME 3: GOVERNING ALTERNATIVE NOVEL PROTEIN PRODUCTION

While alternative proteins are established in Canada, the same cannot be said about alternative novel proteins still in the stage of research and development (R&D). Without a national vision, strategy, or streamlined regulatory framework in place, it is likely alternative novel proteins will take decades to reach consumers.¹⁵ The British Columbia-based Better Butchers start-up, a cultivated meat technology and hybrid product company, serves as a good example of how industry players are navigating the current regulatory context. The company has a goal of building the “world’s first cultivated meat butchery,” estimating that regulatory approval could take upwards of 3 years.¹⁶ In the meantime, the company will explore plant-based and mushroom-based products in order to establish the brand, build distribution networks, and critically, to allow the company to pivot to hybrid products that make use of both established and novel alternative protein ingredients (i.e., hybrid cellular and plant-based products).

In our workshop, participants were not discouraged by Canada’s slower adoption rate. Rather, they saw it as an opportunity to consider the “gap between science, technology, development and how it is going to be implemented in real life” that accounts for agrarian culture and “lifestyle aspects involved,” as explained by a participant (Industry representative). Another participant described the Canadian approach as “cautionary,” which aligns with a lukewarm approach to cellular agriculture policy. They suggested that this regulatory status could be leveraged in order to drive industry development via democratic participation, engaging stakeholders and rights-holders in questions such as: “under what conditions might we be willing to enable or restrict” development (Academic)? While it may put up “barriers for industry” it may also be “protecting things and avoiding too rapid changes without the meaningful consultation and inclusion of different groups” (Academic).

The slower pace of policy was also welcomed by Stó:lō CAC participants as a slowing down of rapid implementation of agri-technologies by top-down colonial powers. This creates space to do policymaking differently, including assessments of technology using criteria that center concerns around food sovereignty, stewardship of cultural keystone species, and adaptation in accordance with Stó:lō legal traditions and cultural protocols.

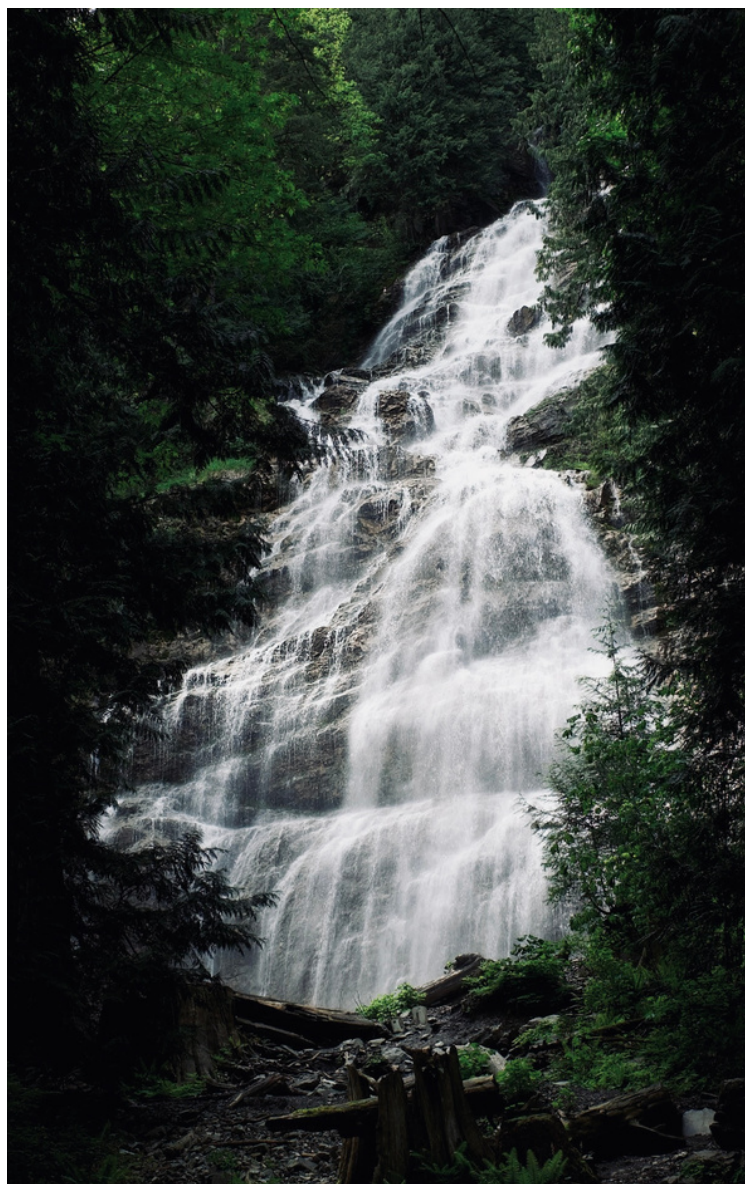
¹⁵ Cellular Agriculture Canada (2025). About. <https://www.cellag.ca/>

¹⁶ The Better Butchers (2025). About. <https://www.thebetterbutchers.com/pages/cultivated-meat>

For Stó:lō and other First Nations whose foodways are heavily impacted by overfishing, agricultural and industrial development and climate change, it is imperative to consider their status as legal rightsholders – rather than stakeholders – in shaping policy and participation in the development of emerging technologies. To this effect, participants described how agricultural transitions might act as vehicles for reconciling past injustices. Some CAC participants highlighted that technologies such as cellular agriculture or controlled-environment systems could play a role in revitalizing cultural foodways, restore local autonomy, and support stewardship practices, on the condition that Indigenous governance and knowledge are embedded from the outset. The work of exploring governance implications of emerging, novel proteins industry across the vast diversity of First Nations, Inuit, and Métis rightsholders is daunting, but progress on Reconciliation and realizing UNDRIP demand the removal of barriers to participation.

More broadly, an industry participant expressed the importance of cellular agriculture development pathways to consider the “regionality” and the “local histories” into the pace of development as it can “provide space for a grassroots level of engagement” (Industry representative). This could mean adopting policies at different scales, such as regional or provincial, rather than at the federal level. Participants identified this as a strengths-based response that could tap into regional advantages as in the case of Alberta, by integrating into existing government efforts to explore value-added opportunities to support producers.

Participants were aware, however, that Canada’s current regulatory context is not intentionally “precautious” in the pursuit of democratic participation. The barriers are more the absence of access to infrastructure, regulatory approval processes, safety concerns, and a challenging funding (e.g., government, venture capital, and academic grants) and IP rights landscape. Significantly, taste testing events are not permitted.



This was identified as a “blocker” to these technologies’ development (P3, W2), since it reinforces a perception gap in which consumers imagine cellular-based products as “hypothetical” instead of recognizing them as real, existing foods. Therefore, participants suggested a way forward could be a patchwork of policies that increase engagement and public consultation to allow for cellular-based agriculture to “advance in a more inclusive way” (industry representative).

Participants emphasized that without substantial government support to build farmers’ capabilities, persistent barriers such as the exclusion of rural and marginalized groups from decisions about jobs, technology adoption, and competitiveness could undermine their ability to participate in fully and benefit from agricultural transitions. These concerns also included equitable access to education and training. A lukewarm, or cautionary regulatory context hinders investment in educational and training programs that will enable individuals to enter, or keep pace with, an emerging sector.

Without enabling policies and regulatory frameworks to promote the development of cellular agriculture, questions about workforce development and job creation remain speculative. In our workshop, participants did not see the emergence of alternative novel proteins as a threat to existing labour and livelihoods. This was described by a participant as an “overly simplistic narrative” that could “create artificial divisions” (Academic) between those working in conventional production and the emerging sector, which could be composed of the same people. Some participants viewed the development of this sector as favourable to those working in conventional production, although nuance is important. As our analysis considers broadly those who work in animal agricultural production, the discussion centered



on producers or farmers rather than farm workers (primary production and processing). With producers and farmers struggling economically, diversifying production, for example using by-products as inputs for novel alternative proteins, could build in resilience on the farm.

The prospect of conventional producers embracing new value-added opportunities into existing practices suggested a positive development. It could address the ongoing challenge of succession planning within Canada's agricultural sector. One participant asked: "who is the next farmer? When you talk about being good ancestors, you know, the average age of a farmer is 56 and the young people aren't interested. So, who is the next farmer" (CAC member)? It was suggested that introducing new prospects on the farm by diversifying production could incentivize younger generations to participate in agriculture.

The discussion was nonetheless limited when it considered farm workers. A participant noted how improved producer livelihoods could see benefits in wages and work-place safety for farm workers. In terms of wages, one participant stated:

“ I think the conversation isn't just about the labour side of things. It's about the production side as well, like how they mesh with each other, and how one influences the other. And obviously, there is a static position by farmers also that, you know, we can't keep raising the wages because it's untenable (CAC member). ”

The assumption that improving the economic status of producers would lead to improvements for farm workers is, however, misleading. There are structurally embedded class differences and power asymmetries between farmers and farm workers. This animates a distinct feature of the agricultural just transition: beyond introducing new profit streams for producers it needs to address labour relations that are entrenched within the sector.

Most participants saw cellular agriculture supplementing, rather than replacing, conventional production: "I don't see this displacing any existing food, like meat, fish, like I don't see it. That's not going anywhere. But I think that this could do is it could be a supplement to that" (P5, W2 urban). This reflects broader views of civil

society and academia of novel proteins such as cellular agriculture as additions to existing food systems, rather than replacements.¹⁷ Participants framed cellular agriculture as a source of additional jobs in labs and production facilities without removing rural agricultural work. As explained by a participant, “these same jobs will stay there because the demands will be there...but it may create some new job opportunities, particularly on the lab side” (S5, W2, urban). Or, in the case of rural production, rather than rural displacement, participants saw potential “integration with existing systems” to accommodate a hybrid model (CAC member).

It was also recognized that this new sector would introduce new types of workers, both directly and indirectly. Direct hires would include new agri-tech workers, and those who perform maintenance within the facilities. As for indirect employment, a participant acknowledged how it could not only “attract a younger farmer,” but this may attract other “folks interested in moving to [rural areas]...opening up other business-like cafes and so forth” catalyzing secondary rural economic revitalization (Academic).

¹⁷ Glaros, A. (2025). The proverbial elephant in the petri-dish: futures for cellular agriculture science in an uncertain world. *Communications Biology*, 8(1), 592.

CONCLUSION

Our workshop findings indicate that the justice of agricultural transitions will depend mainly on how they reshape labour conditions and how emerging agri-tech redistributes power, jobs, and opportunities across the food system. As net-zero ambitions drive rapid change, it becomes essential to examine how new technologies may either support or undermine fair work, land relations, and equitable participation in the future food system. Participants noted that, while cellular agriculture promises social, environmental, and animal welfare gains, it may also accelerate the concentration of corporate power within the food system. In addition, creating new injustices, for example, proprietary IP and tech-driven benefits that overshadow local and regional capabilities and assets, including cultural foodways, and may become an additional barrier to equitable participation in agricultural transitions.



This report highlights how participants increasingly position cellular agriculture as “supplemental,” “additional to,” or “complementary” to conventional livestock production—echoing dominant academic and industry narratives. However, framing cellular agriculture as an addition rather than a transition has significant implications for labour and livelihoods. If conventional livestock production remains unchanged, so too do its embedded injustices, including reliance on precarious migrant labour, poor working conditions, racialized divisions of labour, and vertically integrated supply chains.

Under an “addition-to” model, alternative protein production risks reinforcing existing power asymmetries rather than transforming them. This raises tensions with just transition frameworks that adopt a broad “farmer-inclusive” approach without addressing class hierarchies within agricultural labour.¹⁸ Rather than replacing current dynamics, cellular

¹⁸ Dudley et al., “Thinking across agrarian class hierarchies.”

agriculture may become embedded within them—potentially intensifying existing labour challenges while introducing new ones. Participants emphasized that supplemental framing avoids deeper questions of land justice, Indigenous sovereignty, and climate change mitigation. Reductions in conventional livestock production, by contrast, could open pathways for land and habitat restoration and reinstatement of Indigenous stewardship, with the concrete example of restoring Semá:th Lake and its watershed, currently under intensive agricultural production. Ultimately, framing cellular agriculture as ‘additional’ is not neutral.

It shapes the future of work, livelihoods, and justice within agri-food transitions and raises a central question:

Do these technologies expand or constrain the ability of farmers, farmworkers, Indigenous communities, and rural regions to shape the future of agriculture?



RECOMMENDATIONS

1. DEVELOP A NATIONAL AGRICULTURAL JUST TRANSITION STRATEGY

A National Agricultural Just Transition Strategy should ensure that climate mitigation, adaptation, and agricultural innovation advance environmental sustainability while protecting livelihoods, reducing inequalities, and strengthening rural communities. Priority actions may include:

- a. Establishing a dedicated agricultural stream within Canada's broader sustainable jobs and climate transition agenda, including through the Canadian Sustainable Jobs Act.
- b. Creating a **Just Transition Fund for Agriculture** to support workers, producers and rural communities affected by climate change, technological innovation, and market restructuring.
- c. Creating a Just Transition Fund for Agriculture to support workers, producers and rural communities affected by climate change, technological innovation, and market restructuring.
- d. Developing regionally tailored transition strategies that reflect the diverse ecological, economic (including supply-managed sectors), and labour conditions across Canadian agriculture.
- e. Establishing measurable indicators to monitor emissions reductions, environmental outcomes, employment quality, and decent work, consistent with the International Labour Organization's framework.

2. CENTER WORKERS, PRODUCERS, AND LIVELIHOODS IN AGRICULTURAL INNOVATION

Agricultural innovation should be evaluated not only by productivity and environmental performance, but also by its capacity to improve working conditions, strengthen livelihoods, and reduce social inequalities. Priority actions may include:

- a. Require labour and equity impact assessments for the inclusion of publicly funded agricultural innovation including automation and other agri-technologies.

- b. Prioritize public funding and investment in technologies that improve occupational health and safety, reduce hazardous and physically demanding work, and enhance job quality rather than replacing labour.
- c. Strengthen labour protections for temporary foreign workers and seasonal agricultural workers, including improved housing standards, workplace enforcement mechanisms, freedom of association, and pathways to permanent residency.
- d. Ensure that public research funding supports small- and medium-sized producers, cooperatives, and community-based enterprises alongside larger-scale commercial operations.
- e. Provide financial and technical transition supports that enable producers and workers to adapt to new technologies or climate-smart production practices without bearing disproportionate economic risks.

3. INVEST IN INCLUSIVE EDUCATION AND WORKFORCE DEVELOPMENT

Building a sustainable agricultural sector requires investing in the knowledge, skills, and leadership of current and future agricultural workers, producers, and communities. Priority actions may include:

- a. Expanding funding for agricultural extension services that support climate adaptation, sustainable production, and knowledge exchange.
- b. Develop workforce training in key green skills, including regenerative agriculture, precision agriculture, cellular agriculture, renewable energy, climate adaptation, and ecosystem restoration that supports workers' access to decent work, lifelong learning opportunities, and equitable participation.
- c. Supporting partnerships between colleges, universities, Indigenous educational institutions, unions, and agricultural organizations to deliver locally relevant education and training.
- d. Creating apprenticeship and certification programs for emerging agricultural occupations within sustainable agriculture.
- e. Expand opportunities for new entrants to agriculture, with targeted supports for

young farmers, migrant and racialized communities, Indigenous peoples, women, and others who face systemic barriers to entering and remaining in the sector.

4. STRENGTHEN RURAL ECONOMIC DEVELOPMENT AND DIVERSIFICATION

Agricultural transitions should contribute to diversified, resilient rural economies rather than concentrating economic benefits within a small number of firms or regions. Priority actions may include:

- a. Increasing federal and provincial investments in rural infrastructure, including broadband, transportation networks, and renewable energy projects.
- b. Supporting local and regional food processing facilities, cooperative enterprises, and shorter supply chains to strengthen local economic resilience.
- c. Expanding access to financing for small businesses, social enterprises, and community-owned agricultural initiatives.
- d. Promoting economic diversification in rural communities beyond primary agricultural production such as through ecosystem restoration, renewable energy, agri-tourism, and value-added manufacturing.
- e. Ensure transition investments contribute to long-term community-well being rather than reinforcing existing regional inequalities.

5. ADVANCE INDIGENOUS SELF-DETERMINATION AND FOOD SOVEREIGNTY

Agricultural transitions must uphold Indigenous rights and support Indigenous leadership in food systems, land stewardship, and climate governance. Priority actions may include:

- a. Aligning agricultural policies with the principles of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and Canada's UNDRIP Act.
- b. Supporting Indigenous-led food sovereignty initiatives through long-term, dedicated funding and long-term capacity-building programs.

- c. Expanding access to agricultural land, infrastructure, financing, and technical assistance for Indigenous producers and communities.
- d. Recognizing Indigenous knowledge systems and stewardship as foundational to climate adaptation, biodiversity conservation, and land management programs.
- e. Establishing formal mechanisms for Indigenous participation in agricultural policy development and governance at all levels.

6. DEMOCRATIZE AGRICULTURAL GOVERNANCE AND PARTICIPATION

A just agricultural transition requires transparent, participatory governance that shares decision-making power among those most affected by agricultural transformation. Priority actions may include:

- a. Establishing multi-stakeholder advisory councils that include farmers, agricultural workers, Indigenous representatives, rural municipalities, environmental organizations, unions, and civil society groups.
- b. Strengthen public participation requirements for major agricultural policy reforms, innovation, and investment decisions.
- c. Supporting producer-led and community-led regional planning processes.
- d. Improving public access to information and transparency regarding agricultural subsidies, innovation investments, and transition programs.
- e. Developing participatory monitoring and evaluation frameworks that enable communities to assess whether transition policies advance environmental sustainability, decent work, equality, and rural well-being.

© **July 2026**

Food and Agriculture Institute
33844 King Road
Abbotsford, British Columbia
Canada V2S 7M8
<https://www.ufv.ca/food-agriculture-institute/>

