



BRIEF

"ADVANCEMENTS OF TECHNOLOGY AND RESEARCH IN THE AGRICULTURE INDUSTRY
THAT CAN SUPPORT CANADIAN EXPORTS"

Submitted to the Standing Committee on Agriculture and Agri-Food

By
Simon Dugré
Director, Centre of Social Innovation in Agriculture (CISA)
CÉGEP de Victoriaville

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PREAMBLE

The Centre of Social Innovation in Agriculture (CISA) is affiliated with the College Centres for the Transfer of Technologies (CCTT), whose mission is to support innovation in the industry with a view to increasing development and profitability. CCTT partners must therefore work together toward this mission.

The CISA was established out of concern for a little-documented area of activity and research, specifically, the social dimension of the agricultural sector, particularly the well-being of producers and the vision of the future of agriculture.

The CISA is one of the first three College Centres for the Transfer of Technologies in the field of innovative social practices (CCTT-ISP). It was formed in 2009 at the CÉGEP de Victoriaville. The CISA is backed by the Quebec ministère de l'Éducation et de l'Enseignement supérieur (MEES) as well as the Quebec ministère de l'Économie, de la Science et de l'Innovation (MESI).

The CISA is a relatively recent centre which is already well established within the CEGEP and plays an active role with its partners. Although the first few years of CISA were influenced by the issues identified by teachers and researchers, its work has been constantly evolving. In the beginning, the CISA focused on topics such as psychological distress, building a farm bank to help the next generation of agricultural producers, and managing cultural diversity on Quebec farms. Results from 2012 to 2017 show that the CISA has consistently increased expertise, especially in terms of agricultural succession and the networking process to help young farmers take over farms, and improving the quality of life and support services for agricultural producers.

Other issues have been added, particularly recycling agricultural plastics, developing underused land and transmitting Indigenous food knowledge with a view to cultural reappropriation. Finally, noticeable progress is being made in developing technological innovation along with social and commercial innovation.

Several CISA projects were launched and underwent large-scale expansion. ARTERRE, a project with the Quebec Reference Center for Agriculture and Agri-food (CRAAQ), is a networking service to support and match aspiring farm operators and owners. It prepares the next generation of farmers by helping them take over farms (where successors have not been identified), acquiring or leasing assets, and setting up partnerships to ensure business sustainability and agricultural heritage in Quebec. Nearly a dozen regions in Quebec are participating. Another project which has expanded involves agricultural plastic recycling. This began with the municipality of Tingwick in Centre-du-Quebec, and the CISA is now planning to roll out the service throughout the RCM of Arthabaska. In addition, the Center launched a pilot project to create a farm operator substitute service, which subsequently led to the establishment of the Coopérative de solidarité de services de remplacement agricole.

Our definition of social innovation is as follows: an idea, approach, intervention, service, product, legislation or type of organization; an adequate, sustainable response to a social need; a solution that has been adopted; a measurable benefit for the community; a transformative and systemic change.¹

SUMMARY OF RECOMMENDATIONS

1. Strengthen technological innovation capacity through social innovation at the outset of the co-creation process.
2. Support the Institut national d'agriculture biologique at the CÉGEP de Victoriaville, which plays a synergistic role by bringing together applied research, training and entrepreneurship to support the establishment, start-up and growth of agricultural and agri-food businesses.
3. Support research aimed at mobilizing expertise and talent in area communities to support the bio-food sector and stakeholders based on the characteristics of each region.
4. Support applied research in social innovation to address agricultural and agri-food workforce retention issues, including improved living conditions for workers and agricultural producers.

RECOMMENDATION 1:

According to Grand Challenges Canada (2010 and 2012), the intersection of organizations specializing in social and technological innovations have a greater chance of achieving global impact and sustainability if the intersection takes place from the outset with the appropriate social and business innovations. This is also the view of the Centre of Social Innovation in Agriculture at CÉGEP de Victoriaville.

The CISA has observed through its applied research that the intersection of technological and social expertise in open innovation at the outset of the co-creation process has beneficial effects. Involving users and the business that is marketing the innovative product or service and applying their technological and social expertise at the outset of the innovation project helps to address actual needs. It actually accelerates innovation, improves product or service compliance with user needs, and makes it possible for business to optimize competencies and expertise, thereby improving their innovative capacities. However, this "success" does not always materialize. The CISA noted that relationships break down and put an end to the innovation process. It wants to shed light on the competencies involved in setting up strategic intersectoral alliances of social innovation and technological innovation experts. In doing so, the CISA will be able to improve its own support processes for the benefit of agricultural and agri-food businesses and organizations.

The establishment of intersectoral, technological and social partner alliances seems to be more effective at two key points. The first point would be

¹ As per the work of Camil Bouchard (2006) and the Quebec Social Innovation Network (QSIN).

at the start of the alliance, while the second would be during the transfer of competencies to the business or organization. This is what is called "the internalization of innovation competencies." Strategic alliances appear to be the tip of the iceberg for innovation competencies. These alliances have a wealth of information and strategic competencies that must be developed. Consequently, the CISA wishes to fine-tune its expertise regarding the factors involved in the co-development of innovation competencies and learning in strategic alliances in an intersectoral partnership environment. The CISA also intends to document how co-created expertise or competencies are transferred back to the organization or business. The ultimate aim is to improve the CISA's support processes in a context of open innovation that involves social and technological as well as agricultural and agri-food expertise at the very start of the process. CISA is part of a group of six CCTTs in agriculture and agri-food, including five in technological innovation.

We will approach the term "intersectoral" from two angles. The first was addressed and refers to the simultaneous involvement of support in the social and technological fields in the context of open innovation. The second refers to the relationships between stakeholders in the value chain and the choice of expertise to mobilize depending on the stage in the production cycle. We are referring to the following stages in agriculture and agri-food: input production, production, processing, marketing, and waste and surplus management. For example, the conversion of compost by Gaudreau Environnement, which is responsible for transforming residual resources in the RCM of Arthabaska, requires technological expertise in soil chemistry along with CISA expertise to produce test beds for agricultural producers.

A relevant example is the autonomous weeder, a partnership between the Innovative Vehicle Institute, Elmec and the CISA.

Consequently, the CÉGEP de Victoriaville recommends:

Strengthening technological innovation capacities through social innovation at the outset of the co-creation process.

RECOMMENDATION 2

The CÉGEP de Victoriaville is in the heart of the Centre-du-Quebec region, where about 5% of the economy depends on the bio-food industry. It produces 10 - 15% of

Quebec's food.² It is also one of the regions where organic agriculture is experiencing the most growth. Businesses are very strongly represented in five of the largest sectors of organic production, namely, fruits and vegetables (including cranberries as well as diversified crops), maple syrup, meat, cereals, and milk.

Over the past few decades, the CÉGEP has played a mobilizing role in Quebec regarding important issues concerning training, research and technology transfer in agriculture, particularly in organic agriculture. This excellent leadership has produced results.

The CÉGEP has been providing the main college training in organic fruit and vegetable production in Quebec for 25 years. The number of students registered in livestock and fruit and vegetable production programs has grown from 68 to 167 over the past five years and should rise to 220 students by 2020. This increase attests to the relevance and quality of the programs since very few college programs have such rapid growth.

The CISA and the Centre d'expertise et de transfert en agriculture biologique et de proximité (CETAB+) were established in 2009 and 2010, respectively. Their capacity to bring specialists together to focus on important subjects has allowed both CCTTs to develop rapidly, complete projects totaling over 12 million dollars, and conclude significant partnerships to increase the pace and quality of research and technology transfer activities in Quebec businesses.

Grants from the Natural Sciences and Engineering Research Council of Canada (NSERCC) have allowed CETAB+ to create and maintain the Industrial Research Chair in Organic Agriculture Protection, a first for the college network in the field of agriculture.

The Institut national d'agriculture biologique and the Centre d'interprétation du verger biologique represent investments totaling nearly 19 million dollars from various federal and provincial government departments and agencies such as the Quebec ministère de l'Éducation et de l'Enseignement supérieur (MEES), Quebec ministère de l'Économie, des Sciences et de l'Innovation (MESI), Canada Foundation for Innovation (CFI), Canada Strategic Infrastructure Fund (CSIF) and Economic Development Canada. This support is a good indication of the scope and significance of CÉGEP activities and their recognition by government authorities.

A 10-year financial partnership with the City of Victoriaville totaling several hundred thousand dollars has been established.

In short, the CÉGEP succeeded in developing an enriched, dynamic ecosystem by linking teachers, researchers, students, businesses, advisors and other stakeholders interested in the

² See the *Profil régional de l'industrie bioalimentaire au Québec - Estimations pour 2015* published by the ministère de l'Agriculture, de Pêcheries et de l'Alimentation du Québec (MAPAQ) at: <http://www.mapaq.gouv.qc.ca/fr/md/statistiques/Pages/donneesregionales.aspx>

development of organic agriculture and all related or derivative areas, including technological development, food processing, urban agriculture, closed-loop agriculture, local marketing, healthy eating and the circular economy.

The presence of CCTTs, stakeholders and quality infrastructures creates a unique ecosystem which in turn acts like a virtuous circle: it helps improve instruction, continuing education, research, technology transfer, business services and, ultimately, the success of students, researchers and Quebec businesses.

Consequently, the CISA of CÉGEP de Victoriaville recommends:

Supporting the Institut national d'agriculture biologique of the CÉGEP de Victoriaville, which plays a synergistic role by bringing together applied research, training and entrepreneurship with a view to supporting the establishment, start-up and growth of agricultural and agri-food businesses.

RECOMMENDATION 3

Several organic agriculture-related initiatives are being developed, including urban agriculture, closed-loop agriculture, local marketing, adjustment to climate change, the circular economy, food security, healthy eating and local economic development. They also include water management initiatives for agricultural activities and human consumption.

These approaches find inspiration in several sources including organic agriculture. In fact, the approaches developed in organic agriculture have been the subject of improvements for several decades and share the same ultimate goal: contribute to the sustainability of human activity. These approaches, as well as others, can be part of what might be called sustainable food systems, a concept that is increasingly receiving attention from a growing number of decision-makers and stakeholders.

To really expand, the promoters of these approaches must innovate based on existing knowledge, particularly in organic agriculture, as well as in social innovation. For example, the only purpose of urban agriculture is to produce food: urban agriculture projects are tools for social insertion and integration, and are aimed at improving the sustainability of urban spaces.

Consequently, the CISA of CÉGEP de Victoriaville recommends:

Supporting research aimed at mobilizing the expertise and talents in area communities with a view to supporting the bio-food sector and stakeholders based on the characteristics of each region.

RECOMMENDATION 4

Like many employers in the country, Quebec businesses are facing an acute labour shortage. Among the 27 occupations with a labour shortage, the Commission des partenaires du marché du travail identified two in the agriculture industry: agricultural business managers and agricultural workers³.

The Canadian Agricultural Human Resources Council (CAHRC) estimates that 3,300 jobs were left unfilled in agricultural businesses in Quebec in 2014, which cost the industry 116 million dollars. In addition, the Council estimates that the situation will get worse: by 2025, the number of jobs in the province at risk of going unfilled will increase to 10,600.⁴

Free-trade negotiations, particularly those concerning supply management, are likely to create a climate of insecurity that adds to the stress already felt by producers. That is why the CISA strongly advocates focusing social innovation research on changes in agricultural production practices in the context of a changing world economy.

An example of innovation co-created by the CISA: Substitute (alternative) services implemented following applied research.

Consequently, the CISA of CÉGEP de Victoriaville recommends:

Supporting applied research in social innovation to address agricultural and agri-food workforce retention issues, including improved living conditions for agricultural workers and producers.

³ See <https://www.cpmt.gouv.qc.ca/formation/occupations.asp>.

⁴ See in particular https://cahrc-cerha.ca/sites/default/files/files/Labour-Employment/QC_reportE.pdf