

Remote controlled: The impacts of disruptive technologies in the Ontario agriculture sector

CRRF Northern Dialogues Presentation

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Context

Robots invading farms as part of revolution of agriculture industry

Ag stakeholders talk keeping up with new innovations in streamlining farm production



Lindsay Kelly
Feb 24, 2024 5:58 PM



Government of Canada invests in adoption of precision agriculture technology for local Verner farm

From: [Agriculture and Agri-Food Canada](#)

News release

August 16, 2023 – Verner, Ontario – Agriculture and Agri-Food Canada

NEWS

Farmers embracing technology, sustainable practices and direct-to-consumer sales

Posted on 19 May 2022 in News

Robots milking cows on almost 20 per cent of Canadian dairy farms

Play Video

March 28, 2023 by RealAgriculture Livestock Team



Ontario Tech's entrepreneurship ecosystem helps secure \$1 million grant to investigate winter season food production in Canada

BRILLIANT CATALYST AT ONTARIO TECH CONNECTS LOCAL BUSINESS STARTUPS WITH RESEARCH EXPERTISE TO PRODUCE INNOVATIVE, REAL-LIFE SOLUTIONS

October 24, 2023

Farm to Fork: Growers look to tech to de-risk farming in the North

Panelists share challenges, opportunities involved with Northern Ontario horticulture practices



Lindsay Kelly
Nov 3, 2023 12:00 PM



Canada needs to accommodate spray drones



By Kevin Hursh

Published: April 18, 2024
Opinion

Reading Time: 2 minutes



Project Overview

1 What is the nature and extent of disruptive technologies in the Ontario agri-food context?

2 How are these disruptive technologies reshaping the sector?

3 What is driving adoption of these disruptive technologies?

4 What are the impacts on rural regions and responses by stakeholder organizations?

Mixed Methods Approach

Knowledge Synthesis

Exploring historical shifts, current trends, and a discussion of the drivers, barriers, and impacts of technology adoption on farms and stakeholders in rural communities

Novel Dataset

Creation of a novel dataset of **247** Canadian agricultural technology organizations to explore the national AgTech landscape

Interviews

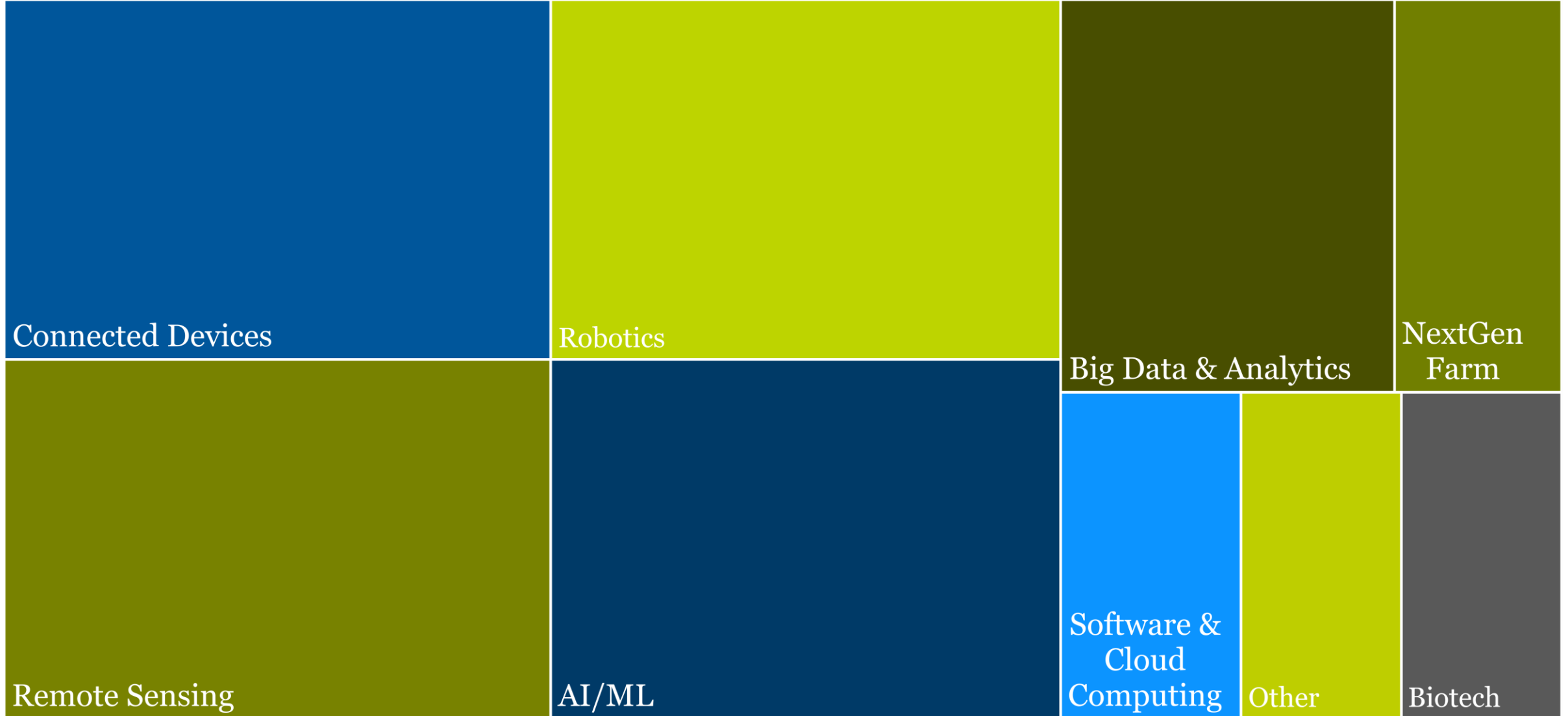
Qualitative research consisting of **48 key informant interviews** with 52 key informants including agricultural industry experts, agricultural-related technology companies, and agricultural business experts

Case Studies

Series of **AgTech case studies** exploring specific technologies and their potential impacts on rural development

TECHNOLOGY ADOPTION

Top Technologies – Adopted Last 5 Years



Drivers of Technology Adoption

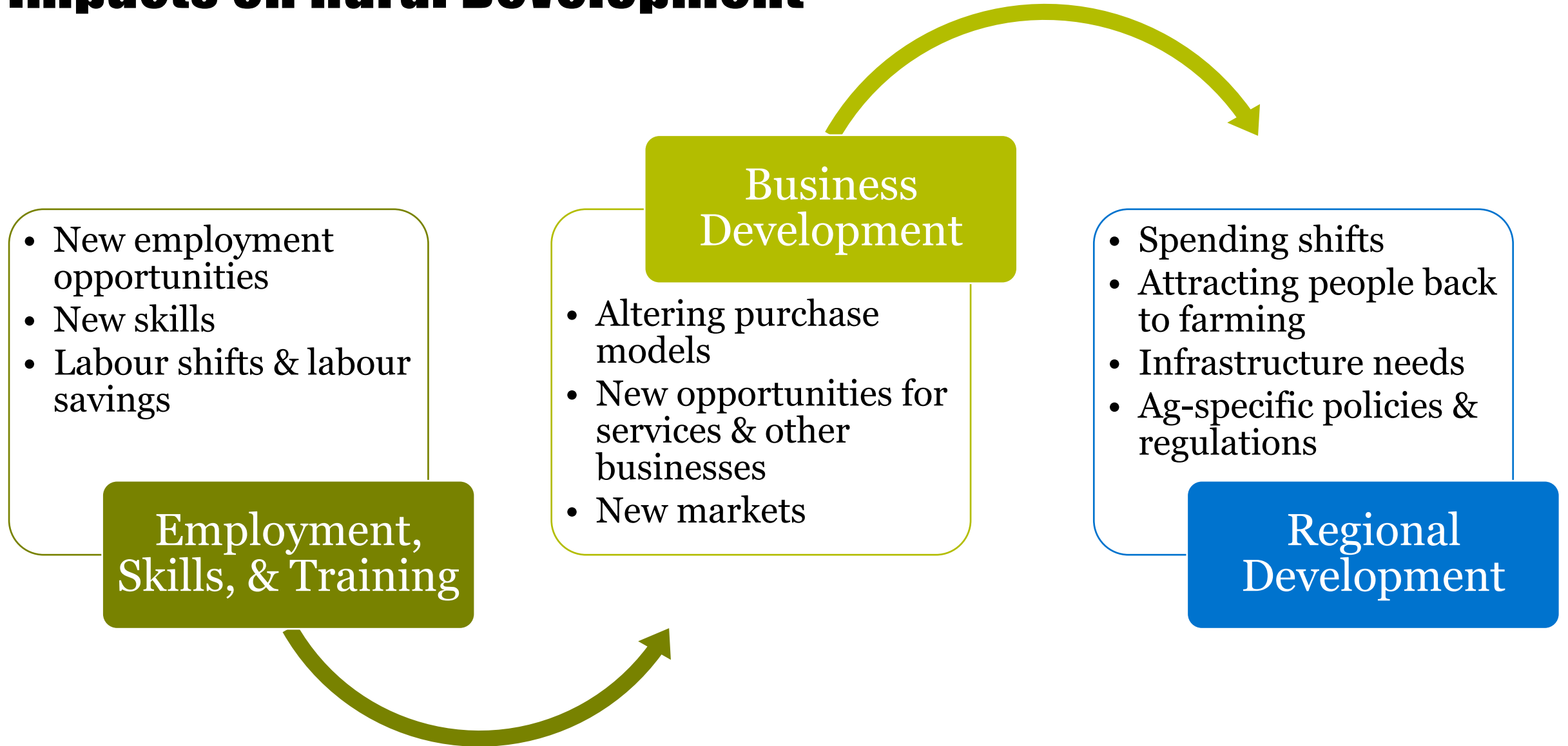
Economic Drivers		Labour Drivers		Plant Drivers	
Increase efficiencies	Reduce input costs	Labour challenges		Optimize plant & soil health	Address weed, disease & pest resistance
	Reduce fuel & energy costs				
Increase production	Compete more effectively	Improve quality of farm work	Improve quality of life for farmers	Other	
				Environmental sustainability	Respond to regulatory requirements

Barriers to Technology Adoption

Technology			Costs	Trust		Skills
Adaptation for farm use		Usability	Upfront investment costs	Skepticism	Risk & uncertain...	New tech skills
Cybersecurity & data privacy concerns	Connectivity	Technolo... mismatch				
		Limited time to test or setup		Interoperabi...	Data sharing	Access to financing
						Canadian market size

IMPACTS

Impacts on Rural Development



Impacts: Employment, Skills & Training

“Instead of looking at replacing labour, which we have not been able to do, and none of the robots have been able to do, honestly. What they have been able to do is make one person more efficient.” (Ag-Related Tech Company 2)

“You're going to need more on-site, you know, somebody with background in like IT computers, electronics.” (Ag Industry Expert 4)

“You need universities or colleges to be teaching these skills to the next wave of workers that are going to have [...] to be able to maintain this equipment.” (Ag Expert 4)

Impacts: Business Development

“We have purchased the robots ourselves. We've taken that risk. And I found customers to rent them and then if they rent them, then, you know, we kind of get our money back over time.” (Ag-Related Tech Company 1)

“[...] we're seeing a growth in independent agronomists. So, yeah, less folks working directly with a particular provider of service, whether that's, you know, a crop input supplier or whether that's, you know, a major precision ag company, a lot more independent folks.” (Ag Industry Expert 2)

Impacts: Regional Development

“[...] If anything, they've [technologies] hurt the regions because there's much less dollars spent locally from farms than there ever used to be.” (Ag Industry Expert 12)

“[Students] come back with a whole different view that agriculture doesn't have to be dirty and [...] it doesn't have to be toiling in the sun. It can be fun.” (Ag-Related Tech Company 2)

“The infrastructure isn't really helping [the] expansion of many businesses down here at the moment. There's no electricity and there's no water...” (Ag Industry Expert 14)

RESPONSES

Responses to Rural Development Impacts

- [Bioenterprise](#)
- [Homegrown Innovation Challenge](#)
- [Vineland Research & Innovation Center](#)

Private Sector

Governments

- [The AgriInnovate Program](#)
- [AgRobotics Working Group](#)

- [Ontario Agri-Food Innovation Alliance](#)
- [Smart Farms Network](#)
- [Palette Skills](#)
- [Greenhouse Technician Program](#)

Postsecondary Institutions

Industry Associations

- [Canadian Food Innovation Network](#)
- [Careers in Ag](#)

AgRobotics Working Group

Advancing introduction of innovative agriculture and food robotics and automation systems to improve farm productivity and the quality of our food

Member Network

- Producers
- Processors
- Manufactures
- Government
- Academia

Research Trials

- Performance testing
- ROI assessments
- Viability evaluations

Mentorship & Commercialization

- Commercialization support
- Investment preparation
- Business plan development
- HR & exec coaching

Knowledge Translation & Events

- Demonstrations
- Farm shows
- Conferences



FUTURE CONSIDERATIONS

Future Considerations for Tech & Rural Development

Ag Technologies

Increases in robotics and automation, especially modular systems

Growing emphasis on AI/computer vision paired with robotics, cloud computing, and IoT

Increased interest in machine learning and predictive analytics



Rural Development Impacts

New tech adoption will lead to a transition from low-skilled work to higher-skilled work

Labour and sustainability considerations will drive tech adoption

Opportunities for improving environmental impact and sustainability, competitiveness, and lifestyle/welfare of farmers

Thank you

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